EQUINIX SV-10/SV-11 DATA CENTERS
5 - 7 GREAT OAKS BOULEVARD
SAN JOSE, CALIFORNIA

AIR QUALITY ASSESSMENT

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Project 15-133

INTRODUCTION

This report provides the results of an assessment of potential air quality impacts from the proposed SV-10 and SV-11 Equinix Data Centers located at 5 - 7 Great Oaks Boulevard in San Jose, California. The project is the development of an 11.5-acre project site with two data centers buildings. The two data centers buildings, each approximately 193,000 square feet in size, would be located on the eastern portion of the 76-acre former iStar property (APN 706-09-117 and -118).

The new data center buildings would house computer servers and supporting equipment for private clients, as well as associated office uses, in environmentally controlled structures. Standby backup electricity for each building would be provided by seven diesel fueled engine-generators located in the equipment yards adjacent to each building (6 primary and one back-up generator). The diesel-fueled emergency backup generators would be used to provide for an uninterrupted power supply. The generators would provide back-up power to the data center when equipment failure or other conditions result in an interruption to the utility-provided electric power. Diesel fuel for generators will be stored in 8,000 gallon aboveground tanks under each generator. The electric generating capacity of each generator would be approximately 3 megawatts (MW). The locations of the new SV-10 and SV-11 data centers and associated backup engine-generators are shown in Figure 1.

Figure 1 – Project Site Layout

The project site is in a mixed-use residential/office/commercial area of the City of San Jose. The proposed data centers would be part of a larger data center campus which currently includes two other data centers, SV-1 and SV-5, located at 11 and 9 Great Oaks Boulevard, respectively. These existing data centers are also shown in Figure 1. The proposed new data centers would be adjacent to areas of proposed residential development to the west and south. However, at present, these residential areas have not been developed.

The primary source of air pollutant emissions from the data centers would be from operation of the generator engines during testing and maintenance of emergency generators. During normal facility operation these engines will not be operated other than for periodic testing and maintenance requirements. The 3 MW generators would use diesel-fueled engines that meet U.S. EPA Tier 2 emission standards. The engines will be fueled using ultra low sulfur diesel fuel with a maximum sulfur content of 15 parts per million (ppm).

This project would be part of the Great Oaks Mixed Use project recently approved by the City of San Jose. The DEIR for that project evaluated air quality impacts associated with development of the Great Oaks site with up to 154,000 square feet of commercial uses, 260,000 square feet of office uses, and 720 residential units on-site. The proposed project would replace the approved 260,000 square feet of office uses with 386,000 square feet of data center uses.

This analysis evaluates the potential air quality impacts from the proposed project that includes the installation of 14 new backup emergency generators at the new data. The proposed project would establish new sources of particulate matter and gaseous emissions. Emissions would primarily result from the testing of the emergency backup generators. The air quality impacts were evaluated in terms of operational impacts to air quality with the primary focus on evaluating the effects of future project-related emissions on regional air quality and on local sensitive receptors. This analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1] Note that an Authority to Construct and Permit to Operate permit would be required from the BAAQMD prior to construction and operation of the proposed project equipment, which may require further analysis of air quality impacts.

SETTING

The project is located in the northern portion of the Santa Clara County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$).

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NOx). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

[1] Bay Area Air Quality Management District, 2011. BAAQMD CEQA Air Quality Guidelines. May.

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and Federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the state's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB and the U.S. EPA have adopted and implemented a number of regulations and emission standards for stationary and mobile sources to reduce emissions of diesel particulate matter (DPM). These include emission standards for off-road diesel engines, including diesel generators, and regulatory programs that affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The closest sensitive receptors to the project site are future residences in the areas adjacent to the western and southern project site boundaries with additional existing residences north of Monterey Road and south of Highway 85.

BAAQMD

The Bay Area Air Quality Management District (BAAQMD) is the regional agency tasked with managing air quality in the region. At the State level, the California Air Resources Board (a part of the California Environmental Protection Agency) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published CEQA Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.[2]

SIGNIFICANCE THRESHOLDS

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These Thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines (updated May 2011). The significance thresholds identified by BAAQMD and used in this analysis are summarized in Table 1.

[2] Bay Area Air Quality Management District. 2011. BAAQMD CEQA Air Quality Guidelines. May.

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, this litigation remains pending as the California Supreme Court recently accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument to be considered is in regard to whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). Therefore, the significance thresholds contained in the 2011 CEQA Air Quality Guidelines are applied to this project.

Table 1. Air Quality Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lb/day)	**Average Daily Emissions (lb/day)**	**Annual Average Emissions (tons/year)**
Criteria Air Pollutants			
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82	82	15
$PM_{2.5}$	54	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards for New Sources			
Excess Cancer Risk	Greater than 10.0 per one million		
Chronic or Acute Hazard Index	Greater than 1.0		
Incremental annual average $PM_{2.5}$	Greater than 0.3 $\mu g/m^3$		
Health Risks and Hazards for Sensitive Receptors (Cumulative from all sources within 1,000 foot zone of influence) and Cumulative Thresholds for New Sources			
Excess Cancer Risk	Greater than 100 per one million		
Chronic Hazard Index	Greater than 10.0		
Annual Average $PM_{2.5}$	Greater than 0.8 $\mu g/m^3$		

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, and $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.

IMPACTS AND MITIGATION

Impact 1: Conflict with or obstruct implementation of the applicable air quality plan?

The most recent clean air plan is the *Bay Area 2010 Clean Air Plan* that was adopted by BAAQMD in September 2010. This plan addresses air quality impacts with respect to obtaining ambient air quality standards for non-attainment pollutants (i.e., ozone and particulate matter or PM_{10} and $PM_{2.5}$), reducing exposure of sensitive receptors to toxic air contaminants (TACs), and reducing greenhouse gas (GHG) emissions such that the region can meet AB 32 goals of reducing emissions to 1990 levels by 2020.

Emissions of non-attainment air pollutants from the proposed project are addressed under *Impact 2 and 3*. Exposure of sensitive receptors associated with the proposed project is addressed under *Impact 4*. The proposed project would not affect population or vehicle miles traveled forecasts used for Clean Air Plan projections, and, as discussed below, emissions and health risks from the project would be below applicable BAAQMD significance thresholds. Thus, this would be a *less than significant* impact.

Impact 2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The Bay Area is considered a nonattainment area for ground-level ozone and $PM_{2.5}$ under both the federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM_{10} under the California Clean Air Act, but not the federal Act. The area has attained both State and federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone, PM_{10} and $PM_{2.5}$, BAAQMD has established thresholds of significance for air pollutants. These thresholds are for ozone precursor pollutants (ROG and NOx), PM_{10} and $PM_{2.5}$ and apply to both construction period and operational period impacts.

Construction Period Emissions

The overall project site area is approximately 11.5 acres and would involve site preparation and construction of the two new 193,000 square foot data centers. Emissions of exhaust, solvents and fugitive dust (i.e., PM10 and $PM_{2.5}$) associated with construction were addressed in the Great Oaks Mixed Use DEIR for construction of 260,000 square feet of office uses.

The California Emissions Estimator Model, Version 2013.2.2 (CalEEMod) was used to assess the difference in construction emissions between the approved office uses and the proposed project. This modeling was conducted using the model construction defaults for a 260,000-square foot office building (General Office Building) and a Warehouse-type building that is 386,000 square feet. Construction emissions between both projects would be similar and the proposed project would not cause substantially higher construction emissions than those reported in the Great Oaks Mixed Use DEIR. Total construction emissions from the two types of uses for the project site are shown in Table 2. CalEEMod model output is contained in *Attachment 1*.

Table 2. Construction Period Emissions – Equinix Project and Great Oaks Office Component

Description	ROG Emissions (tons)	NOx Emissions (tons)	$PM_{2.5}$ Exhaust Emissions (tons)
Approved Great Oaks Office Uses (260,000 square feet)	3.77 tons	6.48 tons	0.35 tons
Proposed Equinix SV10 & SV11 Data Center (386,000 square feet)	2.86 tons	6.86 tons	0.36 tons
Difference (Project – Great Oaks)	-0.91 tons	0.38 tons	<0.01 tons
Daily Project Emissions	*15 lbs/day*	*36 lbs/day*	*2 lbs/day*
BAAQMD Thresholds	*100*	*0.8*	*10.0*
Significant?	***No***	***No***	***No***

Note: Modeled using CalEEMod 2013.2.2 with default inputs for construction. CalEEMod predicts that the proposed project would require 380 construction days

Construction Fugitive Dust

During grading and construction activities, dust would be generated. Most of the dust would result during grading activities. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed at any given time, amount of activity, soil conditions and meteorological conditions. Nearby areas could be adversely affected by dust generated during construction activities. Nearby land uses are primarily commercial and office uses that are separated by roadways or open areas. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are employed to reduce these emissions. This impact is considered less-than-significant with implementation of *Mitigation Measures AQ-1 contained in the Great Oaks Mixed Use DEIR.*

Equinix Operational Project Emissions

The primary emission sources associated with the proposed project would include 14 diesel-fueled 3-megawatt emergency backup generators with 8,000 gallon aboveground diesel storage under each generator and some traffic. Emissions from these sources are described below. More detailed emissions information is provided in *Attachment 2*.

Emergency Generator Emissions

The proposed project would install fourteen 3 MW emergency generators with Caterpillar diesel-fueled engines. During normal facility operation these engines would not be operated other than for periodic testing and maintenance requirements. The generator engines would be fueled using ultra low sulfur diesel fuel with a maximum sulfur content of 15 ppm. The engines would meet U.S. EPA Tier 2 emission standards. These generators, seven per data center, would be located in the equipment yards adjacent to each building (see Figure 1). The generator equipment and operating specifications for the proposed generators are provided in Table 3.

Testing of each generator would generally be preformed twice per month to make sure that they are ready to come online when needed in the event of a power failure. The testing is proposed to normally take place between the hours of 8:00 AM to 5:00 PM. Normal generator testing at no load for 5 minutes would occur monthly and generator testing at full load (100 percent load) for 1 hour would occur for 11 months of the year. In addition to the normal engine testing and operation for maintenance purposes, each

engine would undergo generator load testing for up to four hours per year with the engine at full load. Total generator engine operation under normal conditions is expected to be about 16 hours per year, per engine.

The estimated total emissions from the engines at SV-10 and SV-11 under expected operating conditions (16 hours per year per engine) for testing and maintenance are shown in Table 4.

Table 3. Engine Generator Systems Equipment and Operating Information

Description	Value
Fourteen 3,000 kW Caterpillar Generators	**Caterpillar C175-16 diesel engines**
Generator Output (at 100% load)	3,000 kW
Engine Output (Standby)	
at 100% Load	4,423 horsepower
at 10% Load	611 horsepower
Diesel Fuel Consumption	
at 100% Load	213.2 gallons/hour
at 10% Load	47.9 gallons/hour
Diesel Fuel Sulfur Content	0.0015% (15 ppm)
Exhaust Flow Rate	
at 100% Load	24,561 actual cubic feet/minute
at 10% Load	7,713 actual cubic feet/minute
Stack Height (above ground level)	17 feet
Stack Inside Diameter	18 inches
Exhaust gas Temperature	
at 100% Load	895 ^{o}F
at 10% Load	696 ^{o}F

Note: 10% engine load was used to represent engine operation under no load conditions.

Table 4. Combined SV-10 and SV-11
Maximum Daily and Annual Emissions from Emergency Generators

Pollutant	Average Daily Emissions All 18 Units[a] (lb/day)	Total Annual Emissions[b]: 16 Hours Operation All 18 Units (lb/year)	(ton/year)[c]
NOx	41.2	15,031	7.5
ROG	0.4	134	0.1
CO	3.5	1,285	0.6
PM_{10}	0.2	86	0.04
$PM_{2.5}$	0.2	80	0.04
SO_2	0.03	10	0.0

[a] Average daily emissions calculated from total annual emissions and 365 days per year.

[b] Assumes operation at 100% engine load for 15 hours/year per engine and a total of 1 hour per year at 10% load.

[c] Short tons (2,000 lbs per ton).

Diesel Fuel Storage Emissions

Diesel fuel for each emergency generator would be stored in 8,000 gallon sub-base tanks of the generator housing units. Diesel fuel has a very low volatility and emissions of ROG from fuel storage are expected to be negligible.

Area and Mobile Source Emissions

Development of the project would increase the number of vehicle trips generated from the site (i.e., employees/tenants and vendor delivery trips), which would lead to increased air pollutant emissions. There would also be area source emissions associated with normal facility operation and maintenance. Project related mobile source and area source emissions were modeled using CalEEMod with default conditions for a warehouse type project. CalEEMod predicted annual emissions that were converted to daily emissions based on 365 days of operation. Note that ROG emissions associated with Consumer Product use were excluded from the CalEEMod.

Total Project Emissions

Total daily and annual emissions from the emergency generators and mobile sources are summarized in Tables 4 and 5, respectively.

Change in Predicted Emissions

To evaluate the change in emissions to the Great Oaks Mixed Use project as a whole, the emissions from only the approved office uses were modeled with CalEEMod. The mobile emissions associated with this use were reduced by 19.4 percent to reflect the reductions in trips that were anticipated for the that project. These emissions are also reported in Tables 5 and 6.

Total increased average daily and annual emissions from operation attributable only to the project are estimated to be below the significance thresholds established by the BAAQMD for project operation. The Great Oaks Mixed Use DEIR predicted significant emissions of ROG and NOx, since these emissions exceeded the annual and daily thresholds of 54 pounds per day. With the change in land uses and associated operations, emissions would change. The increase in NOx emissions would not be substantial, since it would not exceed 54 pounds per day or 10 tons per year. The ROG emissions would actually decrease slightly, and therefore, they would not be considered substantial.

Table 5. Summary of Average Daily Emissions (lb/day) from Project Operation

Emission Source	**Nitrogen Oxides (NOx)**	**Reactive Organic Gases (ROG)**	**Respirable Particulates (PM_{10})**	**Fine Particulates ($PM_{2.5}$)**
Great Oaks Office Mixed Use				
	12.6	11.5	8.8	3.3
Equinix SV10 & SV 11 Project				
Emergency Generators	41.2	0.4	0.2	0.2
Mobile & Area Sources	7.9	4.3	6.0	2.2
Total	**49.1**	**4.7**	**6.2**	**2.4**
Increase to Great Oaks Mixed Use Project	*+36.5*	*-6.9*	*-2.6*	*-0.9*
BAAQMD Threshold	*54*	*54*	*82*	*54*

Table 6. Summary of Total Annual Emissions (ton/year) from Project Operation

Emission Source	Nitrogen Oxides (NOx)	Reactive Organic Gases (ROG)	Respirable Particulates (PM_{10})	Fine Particulates ($PM_{2.5}$)
Great Oaks Office Mixed Use				
	2.3	2.1	1.6	0.6
Equinix SV10 & SV 11 Project				
Emergency Generators	7.5	0.1	0.04	0.04
Mobile & Area Sources	1.4	0.8	1.1	0.3
Total	**8.9**	**0.9**	**1.1**	**0.3**
Increase to Great Oaks Mixed Use Project	*+6.6*	*-1.2*	*-0.5*	*-0.3*
BAAQMD Threshold	*10*	*10*	*15*	*10*

Impact 3: Violate any air quality standard or contribute substantially to an existing or projected air quality violation? *Less than significant*

Air Quality Standards for Regional Air Pollutants

Due to the limited number of hours that each emergency generator would be operated for testing and maintenance purposes emissions from these units are relatively low. Emissions of nonattainment pollutants and their precursors that affect air quality standards at the regional level were evaluated under Impact 2. Since project emissions of ozone precursor pollutants and particulate matter (i.e., PM_{10} and $PM_{2.5}$) were found to be less than BAAQMD significance thresholds, they would not cause or contribute to violations of an ambient air quality standard for those pollutants.

Air Quality Standards for Local Air Pollutants (Carbon Monoxide from Project Traffic)

Increased intersection congestion can lead to increased localized CO concentrations (hot spots) in the vicinity of the intersection. Typically there needs to be a substantial increase in the number of vehicles accessing an intersection and a decrease in the intersection level of service (LOS) in order for there to be elevated CO concentrations of concern. Since the number of vehicles associated with the project would be minimal, the proposed project would not cause or contribute to a violation of an ambient air quality standard and the impact is considered *less than significant*

Impact 4: Expose sensitive receptors to substantial pollutant concentrations?
Less than significant

The proposed project would be a source of air pollutant emissions from construction and then from operation of emergency generators for testing and maintenance purposes. These generators are diesel-fueled, so they emit DPM, which is a toxic air contaminant (TAC). The generators are also a source of $PM_{2.5}$, which has known adverse health effects.

The BAAQMD CEQA Air Quality Guidelines considers exposure of sensitive receptors to air pollutant levels that result in an unacceptable cancer risk or hazard to be significant. For cancer risk the BAAQMD considers an increased risk of contracting cancer that is greater than 10.0 in one million to be significant for a single source. For cumulative exposure to TACs from existing sources affecting a sensitive receptor, in addition to a proposed new source, the BAAQMD considers an increased risk of contracting cancer that is greater than 100 in one million to be significant. The BAAQMD CEQA Guidelines also

consider exposure to annual $PM_{2.5}$ concentrations that exceed 0.3 micrograms per cubic meter ($\mu g/m^3$) from a single source to be significant and an annual $PM_{2.5}$ concentration that exceed 0.8 $\mu g/m^3$ from cumulative sources to be significant.

Impacts to sensitive receptors were addressed in the Great Oaks Mixed Use DEIR. Significant $PM_{2.5}$ concentrations were predicted. Mitigation measures to control fugitive $PM_{2.5}$ emissions were identified and found to fully mitigate the impact. As discussed under Impact 2 above, construction of this project would have similar emissions to that of the office uses evaluated under the Great Oaks Mixed Use DEIR. Table 2 indicates that $PM_{2.5}$ emissions could be slightly lower. As a result, the mitigation measure identified in the Great Oaks Mixed Use DEIR would be adequate to fully mitigate $PM_{2.5}$ impacts from the project and sensitive receptors would not be exposed to substantial concentrations of air pollutants to TACs.

Since the proposed new SV-10 and SV-11 data centers will be part of the overall Equinix data center that also includes the existing SV-1 and SV-5 data centers, potential health risks were calculated for both the future operation the SV-10 and SV-11 data centers in addition to the health impacts from all data centers, existing and proposed, and compared to the single source thresholds of significance for health impacts.

Community Risk – Health Risk and Hazards From TAC Exposure From the Proposed Project

Since the proposed project would emit DPM from the generator engines, an analysis was performed to assess what ambient concentrations would result from their operation and to quantify potential health risks at nearby sensitive receptors.

Potential health risks from operation of the project's generators for testing and maintenance purposes and annual load testing were evaluated using air quality dispersion modeling and following the BAAQMD health risk screening analysis guidelines. DPM concentrations and potential cancer risks from operation of the generators were evaluated at the nearby future residential sites and at existing residences in the project vicinity. Figure 2 shows the existing and proposed data centers at the Equinix site and the receptors used to represent the locations of residential receptors. The closest receptors to the site are about 70 feet south of the SV-10 project site. The maximum average annual off-site DPM concentrations were used to calculate potential increased cancer risks from the project. Average annual DPM concentrations were used as being representative of long-term (30-year) exposures for calculation of cancer risks.

Air quality modeling of annual average DPM concentrations was conducted using the EPA's AERMOD dispersion model. The AERMOD model is a steady-state, multiple-source, dispersion model designed to calculate pollutant concentrations from single or multiple sources. The model is recommended by BAAQMD for predicting air pollutant/contaminant concentrations associated with various emissions sources. The AERMOD model predicts pollutant concentrations at receptors located in areas of flat or complex terrain from a variety of emission source types including point, area, volume and line sources. Since there are minimal elevation differences in the topography in the vicinity of the project site, flat terrain was assumed. The land use classification of the area was assumed to be urban.

Hourly meteorological data are required by AERMOD in order to determine the direction and degree of dispersion of emissions in the atmosphere and resulting pollutant concentrations. The modeling used a five-year data set (2006 - 2010) of hourly meteorological data from the San Jose Airport that was prepared by BAAQMD for use with the AERMOD model. The data set includes hourly values of wind speed and direction, air temperature, surface roughness, albedo, Bowen Ratio, and vertical temperature structure of the lower atmosphere.

Annual average DPM and $PM_{2.5}$ concentrations were modeled assuming that generator testing would occur between the hours of 8:00 AM and 5:00 PM and all generators were operated for 16 hours per year. The SV-10 and SV-11 emission source parameters for the generators are listed in Table 2. DPM emissions for SV-1 and SV-5 were calculated based on the particulate matter emissions reported by BAAQMD in the Permit to Operate (PTO) for the existing Equinix data centers emergency diesel generators (BAAQMD Plant # 14676). A copy of the PTO and the emission calculations for SV-1 and SV-5 are included in *Attachment 2*.

A receptor grid with 25 meter spacing was placed in the area of future residents to the south and west of the project site and receptors for existing residences in the project area were placed at their actual locations, as shown in Figure 2. Annual DPM and $PM_{2.5}$ concentrations from project operation were calculated at nearby sensitive receptors at a receptor height of 1.5 meters (4.9 feet).

The maximum modeled annual DPM concentration from operation of SV-10 and SV-11 was 0.0039 $\mu g/m^3$ at a receptor just south of the SV-10 project site in the future residential area to the south of the project site. The maximum modeled annual DPM concentration from operation of all data centers (SV-1, SV-5, SV-10 and SV-11) was 0.0061 $\mu g/m^3$ at a receptor west of the SV-10 project site in the future residential area to the west of the project site. DPM concentration at all existing residential locations farther away from the data centers would be lower then these maximum concentrations. The locations of the maximum modeled DPM concentration are shown on Figure 2.

A community risk assessment for exposure to TACs requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and CARB develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[3] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by state law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[4] This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. While the OEHHA guidelines use substantially more conservative assumptions than the current BAAQMD guidelines, BAAQMD has not formally adopted recommended procedures for applying the newest OEHHA guidelines. However, BAAQMD is in the process of developing new guidance and has provided initial information on exposure parameter values they are proposing for use.[5] The OEHHA guidelines and newly recommended BAAQMD exposure parameters are used in this evaluation.

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer-causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the

[3] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[4] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

[5] Email correspondence from Virginia Lau, BAAQMD to Bill Popenuck of Illingworth & Rodkin, Inc, November 15, 2015.

third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 10^6

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized in Table 7.

T able 7. Health Risk Parameters Used for Cancer Risk Calculations

Parameter	*Exposure Type* / *Age Range*	Infant		Child	Adult
		3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	572	261
Inhalation Absorption Factor		1	1	1	1
Exposure Duration (years)		0.25	2	14	14
Exposure Frequency (days/year)		350	350	350	350
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home		1.0	1.0	1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults

Table 8 shows the maximum predicted community risk levels from the proposed project (SV-10 and SV-11) and operation of existing and proposed Equinix data centers (SV-1, SV-5, SV-10 and SV-11).

Table 8. Maximum Increased Community Risk Levels – Equinix Facility

Source	Cancer Risk (per million)	Maximum Annual $PM_{2.5}$ ($\mu g/m^3$)	Maximum Hazard Index
Proposed Project (SV-1 and SV-11)	2.9	< 0.01	< 0.01
All Equinix Data Centers (SV-1, SV-5, SV-10, and SV-11)	4.5	< 0.01	< 0.01
BAAQMD Single Source Threshold	*10.0*	*0.3*	*1.0*
Significant?	*No*	*No*	*No*

The maximum increased cancer risks from both the proposed project and from existing data centers would be below the BAAQMD significance threshold of a cancer risk of greater than 10.0 in one million, and would be considered a *less than significant impact*.

The maximum modeled annual $PM_{2.5}$ concentration was 0.006 $\mu g/m^3$. This $PM_{2.5}$ concentration is much lower than the BAAQMD significance threshold of 0.3 $\mu g/m^3$ used to judge the significance of health impacts from $PM_{2.5}$. This would be considered a *less than significant impact*.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. Non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). California's Office of Environmental Health and Hazards (OEHHA) has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The chronic inhalation REL for DPM is 5 $\mu g/m^3$. The maximum modeled annual DPM concentration was 0.006 $\mu g/m^3$, which is much lower than the REL. The maximum computed hazard index based on this DPM concentration is 0.001 which is much lower than the BAAQMD significance criterion of a hazard index greater than 1.0. This would be considered a *less than significant impact.*

Details of the modeling and cancer risk calculations are included in *Attachment 2*.

Since the increased cancer risks from exposure to DPM emissions would be much less than 10.0 in one million and annual $PM_{2.5}$ concentrations at sensitive receptors are less than 0.3 $\mu g/m^3$ (BAAQMD thresholds of significance), the proposed project would not result in a significant cancer risk and would be a *less than significant impact*.

Cumulative Operational TAC Exposure

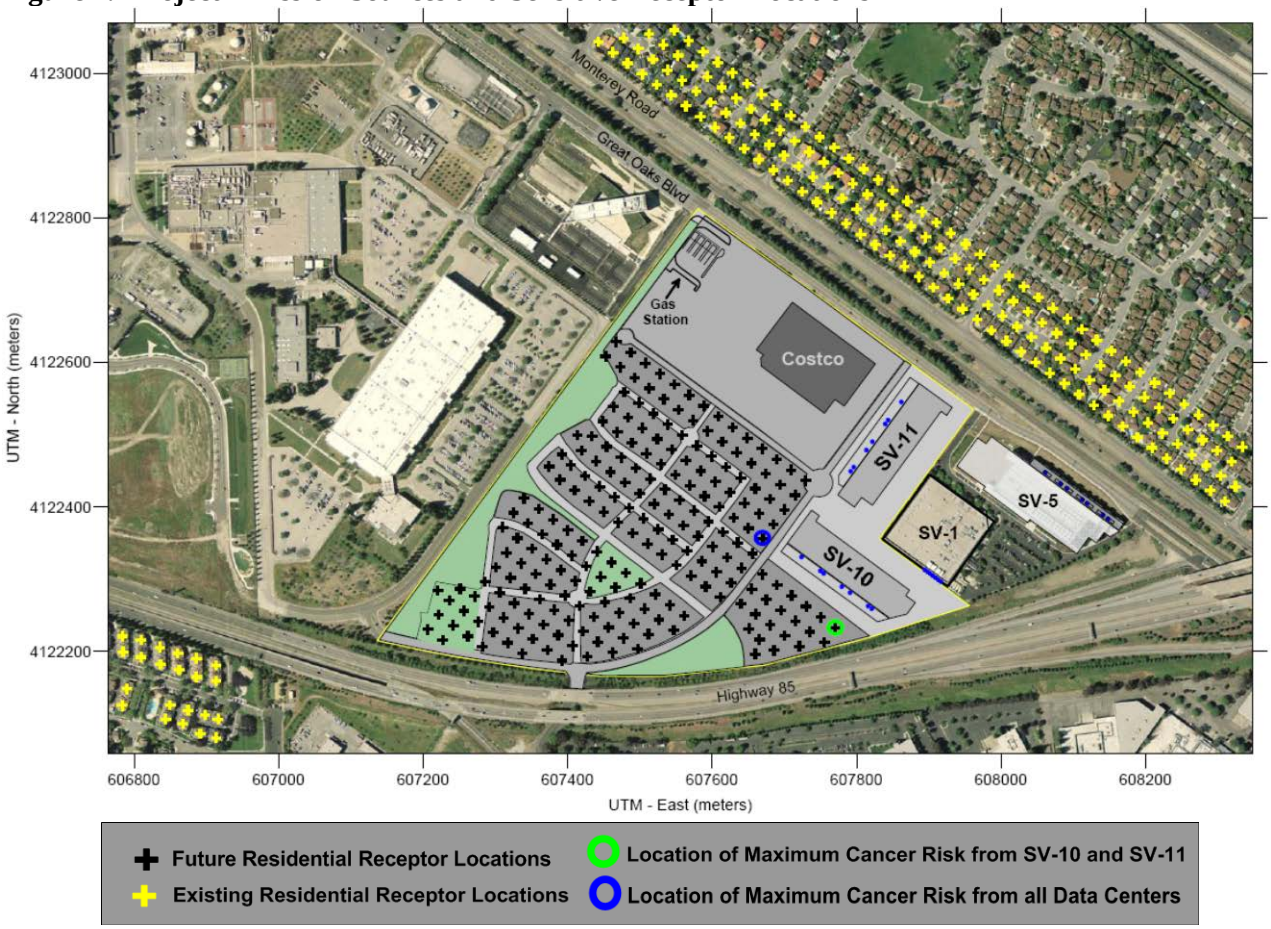
The project site is affected by several sources of TACs. Table 9 shows the cancer risk, hazard index, and $PM_{2.5}$ concentrations associated with each source affecting the project site. The sum of impacts from cumulative sources (i.e., sources within 1,000 feet of the project) would be below the thresholds used by BAAQMD. Note that impacts to off-site sensitive receptors would be less than those to on-site receptors that are closer to the project and the freeway.

Table 9. Impacts from Cumulative Sources – On-Site Receptors

Source	Maximum Cancer Risk (per million)	Maximum Hazard Index	Maximum Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Highway 85 and Monterey Highway Traffic	2.5	<0.01	0.16
Caltrain and Union Pacific Railroad	8.1	<0.01	0.02
Plant No. 12845 - Ahead TeK	0.0	0.0	0.02
Plant No. 19733 – Stion Corporation	0.0	0.0	0.0
Plant No. 19635 - Orchard Supply Hardware	0.4	<0.01	0.00
Equinix – SV-1, SV-5, SV-10 (future), and SV-11 (future)	4.5	<0.01	<0.01
On-Site Project Sources (Delivery/Gas Trucks and Gas Station Operation)	1.8	0.0	0.00
Maximum Single Source	8.1	<0.01	0.16
BAAQMD Threshold - Single Source	***10***	***1.0***	***0.3***
Cumulative Sources	17.3	<0.1	0.2
BAAQMD Threshold – Cumulative Sources	***100***	***10.0***	***0.8***

Note: (1) Except for Equinix facility emissions, the community risk levels are those reported in the Great Oaks Mixed Use DEIR for on-site receptors.
(2) Cumulative source cancer risk adjusted upward by factor of 1.3744 to account for new 2015 OEHHA guidance. Equinix modeling included the 2015 OEHHA adjustments.

Figure 2. Project Emission Sources and Sensitive Receptor Locations



Attachment 1
Project Emissions

Equinix V10 & V11

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	386.00	1000sqft	11.50	386,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Using PG&E 2018 emission rate

Land Use - Based on project description

Construction Phase - Default construction schedule

Off-road Equipment -

Energy Use - Total electricity = 153,300 MWhr*2 = 306,600 MWhr assigned to Nontitle 24 = 794.3 KWhr/sf/yr

Water And Wastewater - Total demand = 262,800,000 gal/year with 236,520,000 exported as wastewater

Consumer Products - no consumer products

Table Name	Column Name	Default Value	New Value
tblConsumerProducts	ROG_EF	2.14E-05	1E-07
tblEnergyUse	NT24E	1.07	794.30
tblLandUse	LotAcreage	8.86	11.50
tblProjectCharacteristics	CO2IntensityFactor	641.35	328
tblProjectCharacteristics	OperationalYear	2014	2018
tblWater	IndoorWaterUseRate	89,262,500.00	236,520,000.00
tblWater	OutdoorWaterUseRate	0.00	26,300,000.00

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					
2016	0.6497	5.3362	4.8587	7.6700e-003	0.4319	0.2976	0.7295	0.1608	0.2780	0.4388	0.0000	670.5950	670.5950	0.1073	0.0000	672.8485
2017	2.2065	1.5225	1.5042	2.6300e-003	0.0786	0.0872	0.1658	0.0212	0.0817	0.1029	0.0000	223.7318	223.7318	0.0330	0.0000	224.4246
Total	**2.8562**	**6.8587**	**6.3629**	**0.0103**	**0.5105**	**0.3848**	**0.8953**	**0.1820**	**0.3597**	**0.5417**	**0.0000**	**894.3267**	**894.3267**	**0.1403**	**0.0000**	**897.2730**

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					
2016	0.6497	5.3362	4.8587	7.6700e-003	0.4319	0.2976	0.7295	0.1608	0.2780	0.4388	0.0000	670.5945	670.5945	0.1073	0.0000	672.8480
2017	2.2065	1.5225	1.5042	2.6300e-003	0.0786	0.0872	0.1658	0.0212	0.0817	0.1029	0.0000	223.7316	223.7316	0.0330	0.0000	224.4244
Total	**2.8562**	**6.8587**	**6.3629**	**0.0103**	**0.5105**	**0.3848**	**0.8953**	**0.1820**	**0.3597**	**0.5417**	**0.0000**	**894.3262**	**894.3262**	**0.1403**	**0.0000**	**897.2724**

	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**

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	0.2087	3.0000e-005	3.6000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.9000e-003	6.9000e-003	2.0000e-005	0.0000	7.2900e-003
Energy	7.6000e-003	0.0691	0.0580	4.1000e-004		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	45,850.2315	45,850.2315	4.0486	0.8387	46,195.2579
Mobile	0.5611	1.3743	6.0525	0.0149	1.0833	0.0189	1.1022	0.2896	0.0174	0.3070	0.0000	1,103.9624	1,103.9624	0.0425	0.0000	1,104.8555
Waste						0.0000	0.0000		0.0000	0.0000	73.6532	0.0000	73.6532	4.3528	0.0000	165.0617
Water						0.0000	0.0000		0.0000	0.0000	75.0369	204.1030	279.1398	7.7251	0.1857	498.9369
Total	**0.7774**	**1.4434**	**6.1141**	**0.0153**	**1.0833**	**0.0241**	**1.1074**	**0.2896**	**0.0227**	**0.3123**	**148.6901**	**47,158.3038**	**47,306.9939**	**16.1690**	**1.0244**	**47,964.1193**

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	0.2087	3.0000e-005	3.6000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.9000e-003	6.9000e-003	2.0000e-005	0.0000	7.2900e-003
Energy	7.6000e-003	0.0691	0.0580	4.1000e-004		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	45,850.2315	45,850.2315	4.0486	0.8387	46,195.2579
Mobile	0.5611	1.3743	6.0525	0.0149	1.0833	0.0189	1.1022	0.2896	0.0174	0.3070	0.0000	1,103.9624	1,103.9624	0.0425	0.0000	1,104.8555
Waste						0.0000	0.0000		0.0000	0.0000	73.6532	0.0000	73.6532	4.3528	0.0000	165.0617
Water						0.0000	0.0000		0.0000	0.0000	75.0369	204.1030	279.1398	7.7237	0.1854	498.8172
Total	**0.7774**	**1.4434**	**6.1141**	**0.0153**	**1.0833**	**0.0241**	**1.1074**	**0.2896**	**0.0227**	**0.3123**	**148.6901**	**47,158.3038**	**47,306.9939**	**16.1676**	**1.0242**	**47,963.9996**

	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**	**0.01**	**0.03**	**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	Site Preparation	Site Preparation	1/1/2016	1/14/2016	5	10	
2	grading	Grading	1/15/2016	2/25/2016	5	30	
3	Exterior Building Construction	Building Construction	2/26/2016	4/20/2017	5	300	
4	Paving	Paving	4/21/2017	5/18/2017	5	20	
5	Interior Building Construction	Architectural Coating	5/19/2017	6/15/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 579,000; Non-Residential Outdoor: 193,000 (Architectural Coating

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Exterior Building Construction	Cranes	1	7.00	226	0.29
Exterior Building Construction	Forklifts	3	8.00	89	0.20
Exterior Building Construction	Generator Sets	1	8.00	84	0.74
Exterior Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Exterior Building Construction	Welders	1	8.00	46	0.45
Interior Building Construction	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
grading	Excavators	2	8.00	162	0.38
grading	Graders	1	8.00	174	0.41
grading	Rubber Tired Dozers	1	8.00	255	0.40
grading	Scrapers	2	8.00	361	0.48
grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Exterior Building Construction	9	162.00	63.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Interior Building Construction	1	32.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2016

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0254	0.2732	0.2055	2.0000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	18.4386	18.4386	5.5600e-003	0.0000	18.5554
Total	**0.0254**	**0.2732**	**0.2055**	**2.0000e-004**	**0.0903**	**0.0147**	**0.1050**	**0.0497**	**0.0135**	**0.0632**	**0.0000**	**18.4386**	**18.4386**	**5.5600e-003**	**0.0000**	**18.5554**

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	3.4000e-004	4.7000e-004	4.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7220	0.7220	4.0000e-005	0.0000	0.7228
Total	**3.4000e-004**	**4.7000e-004**	**4.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7220**	**0.7220**	**4.0000e-005**	**0.0000**	**0.7228**

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0254	0.2732	0.2055	2.0000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	18.4385	18.4385	5.5600e-003	0.0000	18.5553
Total	**0.0254**	**0.2732**	**0.2055**	**2.0000e-004**	**0.0903**	**0.0147**	**0.1050**	**0.0497**	**0.0135**	**0.0632**	**0.0000**	**18.4385**	**18.4385**	**5.5600e-003**	**0.0000**	**18.5553**

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	3.4000e-004	4.7000e-004	4.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7220	0.7220	4.0000e-005	0.0000	0.7228
Total	**3.4000e-004**	**4.7000e-004**	**4.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7220**	**0.7220**	**4.0000e-005**	**0.0000**	**0.7228**

3.3 grading - 2016

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					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0972	1.1222	0.7371	9.3000e-004		0.0538	0.0538		0.0495	0.0495	0.0000	87.2936	87.2936	0.0263	0.0000	87.8465
Total	**0.0972**	**1.1222**	**0.7371**	**9.3000e-004**	**0.1301**	**0.0538**	**0.1839**	**0.0540**	**0.0495**	**0.1034**	**0.0000**	**87.2936**	**87.2936**	**0.0263**	**0.0000**	**87.8465**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.5700e-003	0.0153	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.5000e-004	0.0000	2.4067	2.4067	1.3000e-004	0.0000	2.4094
Total	**1.1200e-003**	**1.5700e-003**	**0.0153**	**3.0000e-005**	**2.7300e-003**	**2.0000e-005**	**2.7500e-003**	**7.3000e-004**	**2.0000e-005**	**7.5000e-004**	**0.0000**	**2.4067**	**2.4067**	**1.3000e-004**	**0.0000**	**2.4094**

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					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0972	1.1222	0.7371	9.3000e-004		0.0538	0.0538		0.0495	0.0495	0.0000	87.2935	87.2935	0.0263	0.0000	87.8464
Total	**0.0972**	**1.1222**	**0.7371**	**9.3000e-004**	**0.1301**	**0.0538**	**0.1839**	**0.0540**	**0.0495**	**0.1034**	**0.0000**	**87.2935**	**87.2935**	**0.0263**	**0.0000**	**87.8464**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.5700e-003	0.0153	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.5000e-004	0.0000	2.4067	2.4067	1.3000e-004	0.0000	2.4094
Total	**1.1200e-003**	**1.5700e-003**	**0.0153**	**3.0000e-005**	**2.7300e-003**	**2.0000e-005**	**2.7500e-003**	**7.3000e-004**	**2.0000e-005**	**7.5000e-004**	**0.0000**	**2.4067**	**2.4067**	**1.3000e-004**	**0.0000**	**2.4094**

3.4 Exterior Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.3764	3.1500	2.0450	2.9600e-003		0.2174	0.2174		0.2043	0.2043	0.0000	267.5797	267.5797	0.0664	0.0000	268.9734
Total	**0.3764**	**3.1500**	**2.0450**	**2.9600e-003**		**0.2174**	**0.2174**		**0.2043**	**0.2043**	**0.0000**	**267.5797**	**267.5797**	**0.0664**	**0.0000**	**268.9734**

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	0.0826	0.6951	0.9412	1.6600e-003	0.0450	0.0104	0.0554	0.0129	9.5800e-003	0.0225	0.0000	150.5464	150.5464	1.2100e-003	0.0000	150.5718
Worker	0.0666	0.0937	0.9101	1.8900e-003	0.1630	1.3000e-003	0.1643	0.0433	1.1900e-003	0.0445	0.0000	143.6080	143.6080	7.6700e-003	0.0000	143.7692
Total	**0.1493**	**0.7888**	**1.8513**	**3.5500e-003**	**0.2079**	**0.0117**	**0.2197**	**0.0562**	**0.0108**	**0.0670**	**0.0000**	**294.1544**	**294.1544**	**8.8800e-003**	**0.0000**	**294.3410**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3764	3.1500	2.0450	2.9600e-003		0.2174	0.2174		0.2043	0.2043	0.0000	267.5794	267.5794	0.0664	0.0000	268.9731
Total	**0.3764**	**3.1500**	**2.0450**	**2.9600e-003**		**0.2174**	**0.2174**		**0.2043**	**0.2043**	**0.0000**	**267.5794**	**267.5794**	**0.0664**	**0.0000**	**268.9731**

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	0.0826	0.6951	0.9412	1.6600e-003	0.0450	0.0104	0.0554	0.0129	9.5800e-003	0.0225	0.0000	150.5464	150.5464	1.2100e-003	0.0000	150.5718
Worker	0.0666	0.0937	0.9101	1.8900e-003	0.1630	1.3000e-003	0.1643	0.0433	1.1900e-003	0.0445	0.0000	143.6080	143.6080	7.6700e-003	0.0000	143.7692
Total	**0.1493**	**0.7888**	**1.8513**	**3.5500e-003**	**0.2079**	**0.0117**	**0.2197**	**0.0562**	**0.0108**	**0.0670**	**0.0000**	**294.1544**	**294.1544**	**8.8800e-003**	**0.0000**	**294.3410**

3.4 Exterior Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.1225	1.0430	0.7161	1.0600e-003		0.0704	0.0704		0.0661	0.0661	0.0000	94.5943	94.5943	0.0233	0.0000	95.0832
Total	**0.1225**	**1.0430**	**0.7161**	**1.0600e-003**		**0.0704**	**0.0704**		**0.0661**	**0.0661**	**0.0000**	**94.5943**	**94.5943**	**0.0233**	**0.0000**	**95.0832**

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	0.0259	0.2225	0.3100	5.9000e-004	0.0161	3.2200e-003	0.0193	4.6100e-003	2.9600e-003	7.5700e-003	0.0000	52.8920	52.8920	4.1000e-004	0.0000	52.9006
Worker	0.0213	0.0300	0.2908	6.7000e-004	0.0583	4.4000e-004	0.0587	0.0155	4.1000e-004	0.0159	0.0000	49.3725	49.3725	2.5100e-003	0.0000	49.4252
Total	**0.0472**	**0.2525**	**0.6008**	**1.2600e-003**	**0.0743**	**3.6600e-003**	**0.0780**	**0.0201**	**3.3700e-003**	**0.0235**	**0.0000**	**102.2645**	**102.2645**	**2.9200e-003**	**0.0000**	**102.3257**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1225	1.0430	0.7161	1.0600e-003		0.0704	0.0704		0.0661	0.0661	0.0000	94.5941	94.5941	0.0233	0.0000	95.0830
Total	**0.1225**	**1.0430**	**0.7161**	**1.0600e-003**		**0.0704**	**0.0704**		**0.0661**	**0.0661**	**0.0000**	**94.5941**	**94.5941**	**0.0233**	**0.0000**	**95.0830**

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	0.0259	0.2225	0.3100	5.9000e-004	0.0161	3.2200e-003	0.0193	4.6100e-003	2.9600e-003	7.5700e-003	0.0000	52.8920	52.8920	4.1000e-004	0.0000	52.9006
Worker	0.0213	0.0300	0.2908	6.7000e-004	0.0583	4.4000e-004	0.0587	0.0155	4.1000e-004	0.0159	0.0000	49.3725	49.3725	2.5100e-003	0.0000	49.4252
Total	**0.0472**	**0.2525**	**0.6008**	**1.2600e-003**	**0.0743**	**3.6600e-003**	**0.0780**	**0.0201**	**3.3700e-003**	**0.0235**	**0.0000**	**102.2645**	**102.2645**	**2.9200e-003**	**0.0000**	**102.3257**

3.5 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8266
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8266**

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	5.0000e-004	7.0000e-004	6.8200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1574	1.1574	6.0000e-005	0.0000	1.1586
Total	**5.0000e-004**	**7.0000e-004**	**6.8200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1574**	**1.1574**	**6.0000e-005**	**0.0000**	**1.1586**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8265
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8265**

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	5.0000e-004	7.0000e-004	6.8200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1574	1.1574	6.0000e-005	0.0000	1.1586
Total	**5.0000e-004**	**7.0000e-004**	**6.8200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1574**	**1.1574**	**6.0000e-005**	**0.0000**	**1.1586**

3.6 Interior Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Archit. Coating	2.0128					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0219	0.0187	3.0000e-005		1.7300e-003	1.7300e-003		1.7300e-003	1.7300e-003	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589
Total	**2.0161**	**0.0219**	**0.0187**	**3.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.5000e-003	0.0145	3.0000e-005	2.9100e-003	2.0000e-005	2.9400e-003	7.7000e-004	2.0000e-005	8.0000e-004	0.0000	2.4690	2.4690	1.3000e-004	0.0000	2.4716
Total	**1.0700e-003**	**1.5000e-003**	**0.0145**	**3.0000e-005**	**2.9100e-003**	**2.0000e-005**	**2.9400e-003**	**7.7000e-004**	**2.0000e-005**	**8.0000e-004**	**0.0000**	**2.4690**	**2.4690**	**1.3000e-004**	**0.0000**	**2.4716**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0128					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0219	0.0187	3.0000e-005		1.7300e-003	1.7300e-003		1.7300e-003	1.7300e-003	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589
Total	**2.0161**	**0.0219**	**0.0187**	**3.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0700e-003	1.5000e-003	0.0145	3.0000e-005	2.9100e-003	2.0000e-005	2.9400e-003	7.7000e-004	2.0000e-005	8.0000e-004	0.0000	2.4690	2.4690	1.3000e-004	0.0000	2.4716
Total	**1.0700e-003**	**1.5000e-003**	**0.0145**	**3.0000e-005**	**2.9100e-003**	**2.0000e-005**	**2.9400e-003**	**7.7000e-004**	**2.0000e-005**	**8.0000e-004**	**0.0000**	**2.4690**	**2.4690**	**1.3000e-004**	**0.0000**	**2.4716**

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	0.5611	1.3743	6.0525	0.0149	1.0833	0.0189	1.1022	0.2896	0.0174	0.3070	0.0000	1,103.9624	1,103.9624	0.0425	0.0000	1,104.8555
Unmitigated	0.5611	1.3743	6.0525	0.0149	1.0833	0.0189	1.1022	0.2896	0.0174	0.3070	0.0000	1,103.9624	1,103.9624	0.0425	0.0000	1,104.8555

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Unrefrigerated Warehouse-No Rail	999.74	999.74	999.74	2,918,752	2,918,752
Total	999.74	999.74	999.74	2,918,752	2,918,752

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Unrefrigerated Warehouse-No	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.551461	0.058468	0.185554	0.123211	0.029507	0.004440	0.012712	0.023230	0.001775	0.001270	0.006089	0.000516	0.001766

5.0 Energy Detail

4.4 Fleet Mix

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	45,775.0472	45,775.0472	4.0472	0.8374	46,119.6161
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	45,775.0472	45,775.0472	4.0472	0.8374	46,119.6161
NaturalGas Mitigated	7.6000e-003	0.0691	0.0580	4.1000e-004		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	75.1843	75.1843	1.4400e-003	1.3800e-003	75.6418
NaturalGas Unmitigated	7.6000e-003	0.0691	0.0580	4.1000e-004		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	75.1843	75.1843	1.4400e-003	1.3800e-003	75.6418

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					
Unrefrigerated Warehouse-No	1.4089e+006	7.6000e-003	0.0691	0.0580	4.1000e-004		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	75.1843	75.1843	1.4400e-003	1.3800e-003	75.6418
Total		**7.6000e-003**	**0.0691**	**0.0580**	**4.1000e-004**		**5.2500e-003**	**5.2500e-003**		**5.2500e-003**	**5.2500e-003**	**0.0000**	**75.1843**	**75.1843**	**1.4400e-003**	**1.3800e-003**	**75.6418**

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					
Unrefrigerated Warehouse-No Rail	1.4089e+006	7.6000e-003	0.0691	0.0580	4.1000e-004		5.2500e-003	5.2500e-003		5.2500e-003	5.2500e-003	0.0000	75.1843	75.1843	1.4400e-003	1.3800e-003	75.6418
Total		**7.6000e-003**	**0.0691**	**0.0580**	**4.1000e-004**		**5.2500e-003**	**5.2500e-003**		**5.2500e-003**	**5.2500e-003**	**0.0000**	**75.1843**	**75.1843**	**1.4400e-003**	**1.3800e-003**	**75.6418**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Unrefrigerated Warehouse-No Rail	3.07673e+008	45,775.0472	4.0472	0.8374	46,119.6161
Total		**45,775.0472**	**4.0472**	**0.8374**	**46,119.6161**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Unrefrigerated Warehouse-No Rail	3.07673e+008	45,775.0472	4.0472	0.8374	46,119.6161
Total		**45,775.0472**	**4.0472**	**0.8374**	**46,119.6161**

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	0.2087	3.0000e-005	3.6000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.9000e-003	6.9000e-003	2.0000e-005	0.0000	7.2900e-003
Unmitigated	0.2087	3.0000e-005	3.6000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.9000e-003	6.9000e-003	2.0000e-005	0.0000	7.2900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2013					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	7.0400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.4000e-004	3.0000e-005	3.6000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.9000e-003	6.9000e-003	2.0000e-005	0.0000	7.2900e-003
Total	**0.2087**	**3.0000e-005**	**3.6000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**6.9000e-003**	**6.9000e-003**	**2.0000e-005**	**0.0000**	**7.2900e-003**

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	0.2013					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	7.0400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.4000e-004	3.0000e-005	3.6000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	6.9000e-003	6.9000e-003	2.0000e-005	0.0000	7.2900e-003
Total	**0.2087**	**3.0000e-005**	**3.6000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**6.9000e-003**	**6.9000e-003**	**2.0000e-005**	**0.0000**	**7.2900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	279.1398	7.7237	0.1854	498.8172
Unmitigated	279.1398	7.7251	0.1857	498.9369

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Unrefrigerated Warehouse-No Rail	236.52 / 26.3	279.1398	7.7251	0.1857	498.9369
Total		**279.1398**	**7.7251**	**0.1857**	**498.9369**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Unrefrigerated Warehouse-No Rail	236.52 / 26.3	279.1398	7.7237	0.1854	498.8172
Total		**279.1398**	**7.7237**	**0.1854**	**498.8172**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	73.6532	4.3528	0.0000	165.0617
Unmitigated	73.6532	4.3528	0.0000	165.0617

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Unrefrigerated Warehouse-No Rail	362.84	73.6532	4.3528	0.0000	165.0617
Total		**73.6532**	**4.3528**	**0.0000**	**165.0617**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Unrefrigerated Warehouse-No Rail	362.84	73.6532	4.3528	0.0000	165.0617
Total		**73.6532**	**4.3528**	**0.0000**	**165.0617**

9.0 Operational Offroad

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

10.0 Vegetation

Great Oaks Office Emissions

Great Oaks Office Uses

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	260.00	1000sqft	11.50	260,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 20018 forecasted rate

Land Use - Great Oaks office portion only

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	250.00
tblLandUse	LotAcreage	5.97	11.50
tblProjectCharacteristics	CO2IntensityFactor	641.35	328
tblProjectCharacteristics	OperationalYear	2014	2018

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					
2016	0.5910	5.0698	4.1161	6.2200e-003	0.3382	0.2937	0.6318	0.1356	0.2744	0.4100	0.0000	552.7714	552.7714	0.1032	0.0000	554.9382
2017	3.1874	1.4366	1.2572	2.0900e-003	0.0437	0.0859	0.1297	0.0119	0.0805	0.0924	0.0000	181.7066	181.7066	0.0316	0.0000	182.3698
Total	**3.7783**	**6.5064**	**5.3733**	**8.3100e-003**	**0.3819**	**0.3796**	**0.7615**	**0.1474**	**0.3550**	**0.5024**	**0.0000**	**734.4780**	**734.4780**	**0.1348**	**0.0000**	**737.3080**

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					
2016	0.5910	5.0698	4.1161	6.2200e-003	0.3382	0.2937	0.6318	0.1356	0.2744	0.4100	0.0000	552.7710	552.7710	0.1032	0.0000	554.9378
2017	3.1874	1.4366	1.2572	2.0900e-003	0.0437	0.0859	0.1297	0.0119	0.0805	0.0924	0.0000	181.7064	181.7064	0.0316	0.0000	182.3696
Total	**3.7783**	**6.5064**	**5.3733**	**8.3100e-003**	**0.3819**	**0.3796**	**0.7615**	**0.1474**	**0.3550**	**0.5024**	**0.0000**	**734.4774**	**734.4774**	**0.1348**	**0.0000**	**737.3074**

	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**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1512	2.0000e-005	2.4200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6500e-003	4.6500e-003	1.0000e-005	0.0000	4.9100e-003
Energy	0.0241	0.2195	0.1844	1.3200e-003		0.0167	0.0167		0.0167	0.0167	0.0000	1,001.3497	1,001.3497	0.0720	0.0183	1,008.5429
Mobile	1.1491	2.5256	11.4706	0.0266	1.9239	0.0341	1.9580	0.5144	0.0314	0.5458	0.0000	1,973.4874	1,973.4874	0.0773	0.0000	1,975.1096
Waste						0.0000	0.0000		0.0000	0.0000	49.0832	0.0000	49.0832	2.9007	0.0000	109.9987
Water						0.0000	0.0000		0.0000	0.0000	14.6606	51.9498	66.6104	1.5104	0.0365	109.6447
Total	**2.3245**	**2.7451**	**11.6574**	**0.0279**	**1.9239**	**0.0508**	**1.9747**	**0.5144**	**0.0481**	**0.5625**	**63.7438**	**3,026.7916**	**3,090.5354**	**4.5604**	**0.0548**	**3,203.3008**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1512	2.0000e-005	2.4200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6500e-003	4.6500e-003	1.0000e-005	0.0000	4.9100e-003
Energy	0.0241	0.2195	0.1844	1.3200e-003		0.0167	0.0167		0.0167	0.0167	0.0000	1,001.3497	1,001.3497	0.0720	0.0183	1,008.5429
Mobile	1.1491	2.5256	11.4706	0.0266	1.9239	0.0341	1.9580	0.5144	0.0314	0.5458	0.0000	1,973.4874	1,973.4874	0.0773	0.0000	1,975.1096
Waste						0.0000	0.0000		0.0000	0.0000	49.0832	0.0000	49.0832	2.9007	0.0000	109.9987
Water						0.0000	0.0000		0.0000	0.0000	14.6606	51.9498	66.6104	1.5101	0.0365	109.6213
Total	**2.3245**	**2.7451**	**11.6574**	**0.0279**	**1.9239**	**0.0508**	**1.9747**	**0.5144**	**0.0481**	**0.5625**	**63.7438**	**3,026.7916**	**3,090.5354**	**4.5601**	**0.0548**	**3,203.2774**

	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**	**0.01**	**0.11**	**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	Site Preparation	Site Preparation	1/1/2016	1/14/2016	5	10	
2	Grading	Grading	1/15/2016	2/25/2016	5	30	
3	Building Construction	Building Construction	2/26/2016	4/20/2017	5	300	
4	Paving	Paving	4/21/2017	5/18/2017	5	20	
5	Architectural Coating	Architectural Coating	5/19/2017	6/15/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 390,000; Non-Residential Outdoor: 130,000 (Architectural Coating

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	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
Site Preparation	7	18.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	83.00	43.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	17.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2016

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0254	0.2732	0.2055	2.0000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	18.4386	18.4386	5.5600e-003	0.0000	18.5554

Total	**0.0254**	**0.2732**	**0.2055**	**2.0000e-004**	**0.0903**	**0.0147**	**0.1050**	**0.0497**	**0.0135**	**0.0632**	**0.0000**	**18.4386**	**18.4386**	**5.5600e-003**	**0.0000**	**18.5554**

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	3.4000e-004	4.7000e-004	4.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7220	0.7220	4.0000e-005	0.0000	0.7228
Total	**3.4000e-004**	**4.7000e-004**	**4.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7220**	**0.7220**	**4.0000e-005**	**0.0000**	**0.7228**

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0254	0.2732	0.2055	2.0000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	18.4385	18.4385	5.5600e-003	0.0000	18.5553
Total	**0.0254**	**0.2732**	**0.2055**	**2.0000e-004**	**0.0903**	**0.0147**	**0.1050**	**0.0497**	**0.0135**	**0.0632**	**0.0000**	**18.4385**	**18.4385**	**5.5600e-003**	**0.0000**	**18.5553**

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	3.4000e-004	4.7000e-004	4.5800e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7220	0.7220	4.0000e-005	0.0000	0.7228
Total	**3.4000e-004**	**4.7000e-004**	**4.5800e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7220**	**0.7220**	**4.0000e-005**	**0.0000**	**0.7228**

3.3 Grading - 2016

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					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0972	1.1222	0.7371	9.3000e-004		0.0538	0.0538		0.0495	0.0495	0.0000	87.2936	87.2936	0.0263	0.0000	87.8465

Total	**0.0972**	**1.1222**	**0.7371**	**9.3000e-004**	**0.1301**	**0.0538**	**0.1839**	**0.0540**	**0.0495**	**0.1034**	**0.0000**	**87.2936**	**87.2936**	**0.0263**	**0.0000**	**87.8465**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.5700e-003	0.0153	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.5000e-004	0.0000	2.4067	2.4067	1.3000e-004	0.0000	2.4094
Total	**1.1200e-003**	**1.5700e-003**	**0.0153**	**3.0000e-005**	**2.7300e-003**	**2.0000e-005**	**2.7500e-003**	**7.3000e-004**	**2.0000e-005**	**7.5000e-004**	**0.0000**	**2.4067**	**2.4067**	**1.3000e-004**	**0.0000**	**2.4094**

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					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0972	1.1222	0.7371	9.3000e-004		0.0538	0.0538		0.0495	0.0495	0.0000	87.2935	87.2935	0.0263	0.0000	87.8464
Total	**0.0972**	**1.1222**	**0.7371**	**9.3000e-004**	**0.1301**	**0.0538**	**0.1839**	**0.0540**	**0.0495**	**0.1034**	**0.0000**	**87.2935**	**87.2935**	**0.0263**	**0.0000**	**87.8464**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.5700e-003	0.0153	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.5000e-004	0.0000	2.4067	2.4067	1.3000e-004	0.0000	2.4094
Total	**1.1200e-003**	**1.5700e-003**	**0.0153**	**3.0000e-005**	**2.7300e-003**	**2.0000e-005**	**2.7500e-003**	**7.3000e-004**	**2.0000e-005**	**7.5000e-004**	**0.0000**	**2.4067**	**2.4067**	**1.3000e-004**	**0.0000**	**2.4094**

3.4 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3764	3.1500	2.0450	2.9600e-003		0.2174	0.2174		0.2043	0.2043	0.0000	267.5797	267.5797	0.0664	0.0000	268.9734
Total	**0.3764**	**3.1500**	**2.0450**	**2.9600e-003**		**0.2174**	**0.2174**		**0.2043**	**0.2043**	**0.0000**	**267.5797**	**267.5797**	**0.0664**	**0.0000**	**268.9734**

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	0.0564	0.4745	0.6424	1.1300e-003	0.0307	7.1100e-003	0.0378	8.8000e-003	6.5400e-003	0.0153	0.0000	102.7539	102.7539	8.3000e-004	0.0000	102.7712
Worker	0.0341	0.0480	0.4663	9.7000e-004	0.0835	6.7000e-004	0.0842	0.0222	6.1000e-004	0.0228	0.0000	73.5770	73.5770	3.9300e-003	0.0000	73.6595
Total	**0.0905**	**0.5225**	**1.1087**	**2.1000e-003**	**0.1142**	**7.7800e-003**	**0.1220**	**0.0310**	**7.1500e-003**	**0.0382**	**0.0000**	**176.3308**	**176.3308**	**4.7600e-003**	**0.0000**	**176.4307**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3764	3.1500	2.0450	2.9600e-003		0.2174	0.2174		0.2043	0.2043	0.0000	267.5794	267.5794	0.0664	0.0000	268.9731
Total	**0.3764**	**3.1500**	**2.0450**	**2.9600e-003**		**0.2174**	**0.2174**		**0.2043**	**0.2043**	**0.0000**	**267.5794**	**267.5794**	**0.0664**	**0.0000**	**268.9731**

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	0.0564	0.4745	0.6424	1.1300e-003	0.0307	7.1100e-003	0.0378	8.8000e-003	6.5400e-003	0.0153	0.0000	102.7539	102.7539	8.3000e-004	0.0000	102.7712
Worker	0.0341	0.0480	0.4663	9.7000e-004	0.0835	6.7000e-004	0.0842	0.0222	6.1000e-004	0.0228	0.0000	73.5770	73.5770	3.9300e-003	0.0000	73.6595
Total	**0.0905**	**0.5225**	**1.1087**	**2.1000e-003**	**0.1142**	**7.7800e-003**	**0.1220**	**0.0310**	**7.1500e-003**	**0.0382**	**0.0000**	**176.3308**	**176.3308**	**4.7600e-003**	**0.0000**	**176.4307**

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1225	1.0430	0.7161	1.0600e-003		0.0704	0.0704		0.0661	0.0661	0.0000	94.5943	94.5943	0.0233	0.0000	95.0832
Total	**0.1225**	**1.0430**	**0.7161**	**1.0600e-003**		**0.0704**	**0.0704**		**0.0661**	**0.0661**	**0.0000**	**94.5943**	**94.5943**	**0.0233**	**0.0000**	**95.0832**

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	0.0177	0.1518	0.2116	4.0000e-004	0.0110	2.2000e-003	0.0132	3.1500e-003	2.0200e-003	5.1700e-003	0.0000	36.1009	36.1009	2.8000e-004	0.0000	36.1067
Worker	0.0109	0.0154	0.1490	3.5000e-004	0.0299	2.3000e-004	0.0301	7.9400e-003	2.1000e-004	8.1500e-003	0.0000	25.2958	25.2958	1.2800e-003	0.0000	25.3228
Total	**0.0286**	**0.1672**	**0.3606**	**7.5000e-004**	**0.0408**	**2.4300e-003**	**0.0433**	**0.0111**	**2.2300e-003**	**0.0133**	**0.0000**	**61.3967**	**61.3967**	**1.5600e-003**	**0.0000**	**61.4295**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1225	1.0430	0.7161	1.0600e-003		0.0704	0.0704		0.0661	0.0661	0.0000	94.5941	94.5941	0.0233	0.0000	95.0830
Total	**0.1225**	**1.0430**	**0.7161**	**1.0600e-003**		**0.0704**	**0.0704**		**0.0661**	**0.0661**	**0.0000**	**94.5941**	**94.5941**	**0.0233**	**0.0000**	**95.0830**

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	0.0177	0.1518	0.2116	4.0000e-004	0.0110	2.2000e-003	0.0132	3.1500e-003	2.0200e-003	5.1700e-003	0.0000	36.1009	36.1009	2.8000e-004	0.0000	36.1067
Worker	0.0109	0.0154	0.1490	3.5000e-004	0.0299	2.3000e-004	0.0301	7.9400e-003	2.1000e-004	8.1500e-003	0.0000	25.2958	25.2958	1.2800e-003	0.0000	25.3228
Total	**0.0286**	**0.1672**	**0.3606**	**7.5000e-004**	**0.0408**	**2.4300e-003**	**0.0433**	**0.0111**	**2.2300e-003**	**0.0133**	**0.0000**	**61.3967**	**61.3967**	**1.5600e-003**	**0.0000**	**61.4295**

3.5 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8266
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8266**

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	5.0000e-004	7.0000e-004	6.8200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1574	1.1574	6.0000e-005	0.0000	1.1586
Total	**5.0000e-004**	**7.0000e-004**	**6.8200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1574**	**1.1574**	**6.0000e-005**	**0.0000**	**1.1586**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8265
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8265**

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	5.0000e-004	7.0000e-004	6.8200e-003	2.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1574	1.1574	6.0000e-005	0.0000	1.1586
Total	**5.0000e-004**	**7.0000e-004**	**6.8200e-003**	**2.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1574**	**1.1574**	**6.0000e-005**	**0.0000**	**1.1586**

3.6 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.0128					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0219	0.0187	3.0000e-005		1.7300e-003	1.7300e-003		1.7300e-003	1.7300e-003	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589

Total	**3.0161**	**0.0219**	**0.0187**	**3.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

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	5.7000e-004	8.0000e-004	7.7200e-003	2.0000e-005	1.5500e-003	1.0000e-005	1.5600e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.3117	1.3117	7.0000e-005	0.0000	1.3131
Total	**5.7000e-004**	**8.0000e-004**	**7.7200e-003**	**2.0000e-005**	**1.5500e-003**	**1.0000e-005**	**1.5600e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.3117**	**1.3117**	**7.0000e-005**	**0.0000**	**1.3131**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.0128					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0219	0.0187	3.0000e-005		1.7300e-003	1.7300e-003		1.7300e-003	1.7300e-003	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589
Total	**3.0161**	**0.0219**	**0.0187**	**3.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

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	5.7000e-004	8.0000e-004	7.7200e-003	2.0000e-005	1.5500e-003	1.0000e-005	1.5600e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.3117	1.3117	7.0000e-005	0.0000	1.3131
Total	**5.7000e-004**	**8.0000e-004**	**7.7200e-003**	**2.0000e-005**	**1.5500e-003**	**1.0000e-005**	**1.5600e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.3117**	**1.3117**	**7.0000e-005**	**0.0000**	**1.3131**

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	1.1491	2.5256	11.4706	0.0266	1.9239	0.0341	1.9580	0.5144	0.0314	0.5458	0.0000	1,973.4874	1,973.4874	0.0773	0.0000	1,975.1096
Unmitigated	1.1491	2.5256	11.4706	0.0266	1.9239	0.0341	1.9580	0.5144	0.0314	0.5458	0.0000	1,973.4874	1,973.4874	0.0773	0.0000	1,975.1096

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	2,862.60	616.20	254.80	5,183,715	5,183,715
Total	2,862.60	616.20	254.80	5,183,715	5,183,715

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.551461	0.058468	0.185554	0.123211	0.029507	0.004440	0.012712	0.023230	0.001775	0.001270	0.006089	0.000516	0.001766

5.0 Energy Detail

4.4 Fleet Mix

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	762.4293	762.4293	0.0674	0.0140	768.1684
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	762.4293	762.4293	0.0674	0.0140	768.1684
NaturalGas Mitigated	0.0241	0.2195	0.1844	1.3200e-003		0.0167	0.0167		0.0167	0.0167	0.0000	238.9204	238.9204	4.5800e-003	4.3800e-003	240.3745
NaturalGas Unmitigated	0.0241	0.2195	0.1844	1.3200e-003		0.0167	0.0167		0.0167	0.0167	0.0000	238.9204	238.9204	4.5800e-003	4.3800e-003	240.3745

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	4.4772e+006	0.0241	0.2195	0.1844	1.3200e-003		0.0167	0.0167		0.0167	0.0167	0.0000	238.9204	238.9204	4.5800e-003	4.3800e-003	240.3745
Total		**0.0241**	**0.2195**	**0.1844**	**1.3200e-003**		**0.0167**	**0.0167**		**0.0167**	**0.0167**	**0.0000**	**238.9204**	**238.9204**	**4.5800e-003**	**4.3800e-003**	**240.3745**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	4.4772e+006	0.0241	0.2195	0.1844	1.3200e-003		0.0167	0.0167		0.0167	0.0167	0.0000	238.9204	238.9204	4.5800e-003	4.3800e-003	240.3745
Total		**0.0241**	**0.2195**	**0.1844**	**1.3200e-003**		**0.0167**	**0.0167**		**0.0167**	**0.0167**	**0.0000**	**238.9204**	**238.9204**	**4.5800e-003**	**4.3800e-003**	**240.3745**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	5.1246e+006	762.4293	0.0674	0.0140	768.1684
Total		**762.4293**	**0.0674**	**0.0140**	**768.1684**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	5.1246e+006	762.4293	0.0674	0.0140	768.1684
Total		**762.4293**	**0.0674**	**0.0140**	**768.1684**

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	1.1512	2.0000e-005	2.4200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6500e-003	4.6500e-003	1.0000e-005	0.0000	4.9100e-003
Unmitigated	1.1512	2.0000e-005	2.4200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6500e-003	4.6500e-003	1.0000e-005	0.0000	4.9100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1356					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0154					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6500e-003	4.6500e-003	1.0000e-005	0.0000	4.9100e-003
Total	**1.1512**	**2.0000e-005**	**2.4200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.6500e-003**	**4.6500e-003**	**1.0000e-005**	**0.0000**	**4.9100e-003**

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					
Consumer Products	1.0154					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.6500e-003	4.6500e-003	1.0000e-005	0.0000	4.9100e-003
Architectural Coating	0.1356					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1512**	**2.0000e-005**	**2.4200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.6500e-003**	**4.6500e-003**	**1.0000e-005**	**0.0000**	**4.9100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	66.6104	1.5101	0.0365	109.6213
Unmitigated	66.6104	1.5104	0.0365	109.6447

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	46.2108 / 28.3227	66.6104	1.5104	0.0365	109.6447
Total		**66.6104**	**1.5104**	**0.0365**	**109.6447**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	46.2108 / 28.3227	66.6104	1.5101	0.0365	109.6213
Total		**66.6104**	**1.5101**	**0.0365**	**109.6213**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	49.0832	2.9007	0.0000	109.9987
Unmitigated	49.0832	2.9007	0.0000	109.9987

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	241.8	49.0832	2.9007	0.0000	109.9987
Total		**49.0832**	**2.9007**	**0.0000**	**109.9987**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	241.8	49.0832	2.9007	0.0000	109.9987
Total		**49.0832**	**2.9007**	**0.0000**	**109.9987**

9.0 Operational Offroad

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

10.0 Vegetation

Attachment 2
Equinix Generator Emissions Calculations and Information

Table 1a

Equinix Data Center SV10 - Emergency Backup Generators

Emissions From Periodic Engine Testing with no Generator Load- 9 Engines

Periodic Testing at Low Engine Load*

Manufacturer/Model	**Caterpillar**
Engine	**C175-16**
Total No. Units	7
Generator Output (kW)	-
Load During Testing	10%
Engine Output (hp)	611
Fuel Use (gal/hr) at Load	47.9
Fuel Sulfur Content (%)	0.0015

Emission Testing Information

	Maximum Daily Testing	**Maximum** Annual Testing**
No. Units Tested. =	7	7
Test Duration/Unit (min) =	5	5
Tests per Period/Unit =	1	12
Operation./Unit (hours) =	0.08	1
Total Operation (hours) =	0.58	7

Pollutant	**Emission[1] Factor (g/hp-hr)**	**Emission Rate per Unit (lb/hr)**	**Operational Maximum Emissions per Unit** Daily (lb/day)	Annual (lb/yr)	Annual (ton/yr)	**Operational - Total Emissions[2]** Daily Maximum (lb/day)	Annual Maximum (lb/yr)	(ton/yr)
NOx[1a]	5.47	7.37	0.61	7.37	0.004	4.30	51.6	0.03
HC[1a]	0.57	0.77	0.06	0.77	0.000	0.45	5.4	0.00
CO[1a]	2.99	4.03	0.34	4.03	0.002	2.35	28.2	0.01
PM10[1a]	0.21	0.28	0.024	0.28	0.0001	0.17	2.0	0.001
PM2.5[3]	0.20	0.27	0.022	0.27	0.0001	0.15	1.9	0.001
SOx[1b]	-	0.010	0.001	0.01	0.0000	0.006	0.1	0.000
CO_2[1c]	22.38 lb/gal	1,072	89	1,072	0.5	625	7,503	4

Notes: * Emissions at 10% engine load for 5 minutes per test with no generator load attached assumed for normal testing of engines

** Maximum annual testing based on 1 hour for periodic normal testing an low load per unit per year.

1) Based on manufacturer's data at 10% load.

1a) Caterpillar C-175-16 Performance Data Sheet [DM8448] at 10% load

1b) Calculated based on fuel sulfur content and fuel use.

1c) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009

2) Based on the number of units operating for the specified time period

3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Table 1b
Equinix Data Center SV10 - Emergency Backup Generators
Emissions From Periodic Generator Full Load Testing - 9 Engines

Periodic Generator Full Load Testing*

Manufacturer/Model	**Caterpillar**
Engine	**C175-16**
Total No. Units	7
Engine Operating Load	***100%***
Generator Output (kW)	3,000
Load During Testing	100%
Max Engine Output (hp)	4,423
Fuel Use (gal/hr) at Load	213.2
Fuel Sulfur Content (%)	0.0015

Emission Testing Information

	Max. Daily Testing	**Maximum** Annual Testing**
No. Units Tested. =	7	7
Test Duration/Unit (min) =	240	60
Tests per Period/Unit =	1	15
Operation./Unit (hours) =	4	15
Total Operation (hours) =	28	105

			Operational			**Operational - Total Emissions[2]**		
			Maximum Emissions per Unit					
Pollutant	**Emission[1] Factor (g/hp-hr)**	**Emission Rate per Unit (lb/hr)**	**Daily (lb/day)**	**Annual (lb/yr)**	**Annual (ton/yr)**	**Daily Maximum (lb/day)**	**Annual (lb/yr)**	**(ton/yr)**
NOx[1a]	7.29	71.09	284.34	1066.3	0.53	1990.39	7,464.0	3.73
HC[1a]	0.06	0.59	2.34	8.8	0.00	16.38	61.4	0.03
CO[1a]	0.60	5.85	23.40	87.8	0.04	163.82	614.3	0.31
PM10[1a]	0.04	0.39	1.56	5.9	0.0029	10.92	41.0	0.020
PM2.5[3]	0.04	0.37	1.46	5.5	0.0027	10.23	38.4	0.019
SOx[1c]	-	0.045	0.180	0.7	0.0003	1.26	4.7	0.0024
CO_2[1d]	22.38 lb/gal	4,771	19,083	71,561	35.8	133,580	500,925	250

Notes: * Emissions at 100% engine load for 1 hour per month plus an additional 3 hours at full load per year.
** Maximum annual generator load testing based on 15 hours of generator load testing per unit per year.
1) Based on manufacturer's data at 100% load.
1a) Caterpillar C-175-16 Performance Data Sheet [DM8448] at 10% load
1b) Calculated based on fuel sulfur content and fuel use.
1c) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009
2) Based on the number of units operating for the specified time period
3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Table 1c
Equinix Data Center SV10 - Emergency Backup Generators
Average Daily and Annual Emissions From All Generator Testing

	Operational - Total Emissions		
	Average* Daily	**Annual Maximum**	
Pollutant	**(lb/day)**	**(lb/yr)**	**(ton/yr)**
NOx	20.6	7,515.6	3.76
ROG	0.18	66.8	0.03
CO	1.76	642.5	0.32
PM10	0.12	42.9	0.02
PM2.5	0.11	40.2	0.02
SOx	0.01	4.8	0.00
CO_2	1393	508,427	254

* Average daily emissions calculated from total annual emissions and 365 days per year

Table 2a

Equinix Data Center SV11 - Emergency Backup Generators

Emissions From Periodic Engine Testing with no Generator Load- 9 Engines

Periodic Testing at Low Engine Load*

Manufacturer/Model	**Caterpillar**
Engine	**C175-16**
Total No. Units	7
Generator Output (kW)	-
Load During Testing	10%
Engine Output (hp)	611
Fuel Use (gal/hr) at Load	47.9
Fuel Sulfur Content (%)	0.0015

Emission Testing Information

	Maximum Daily Testing	**Maximum** Annual Testing**
No. Units Tested. =	7	7
Test Duration/Unit (min) =	5	5
Tests per Period/Unit =	1	12
Operation./Unit (hours) =	0.08	1
Total Operation (hours) =	0.58	7

Pollutant	**Emission[1] Factor (g/hp-hr)**	**Emission Rate per Unit (lb/hr)**	**Operational Maximum Emissions per Unit**			**Operational - Total Emissions[2]**		
			Daily (lb/day)	**Annual (lb/yr)**	**Annual (ton/yr)**	**Daily Maximum (lb/day)**	**Annual Maximum (lb/yr)**	**(ton/yr)**
NOx[1a]	5.47	7.37	0.61	7.37	0.004	4.30	51.6	0.03
HC[1a]	0.57	0.77	0.06	0.77	0.000	0.45	5.4	0.00
CO[1a]	2.99	4.03	0.34	4.03	0.002	2.35	28.2	0.01
PM10[1a]	0.21	0.28	0.024	0.28	0.0001	0.17	2.0	0.001
PM2.5[3]	0.20	0.27	0.022	0.27	0.0001	0.15	1.9	0.001
SOx[1b]	-	0.010	0.001	0.01	0.0000	0.006	0.1	0.000
CO_2[1c]	22.38 lb/gal	1,072	89	1,072	0.5	625	7,503	4

Notes: * Emissions at 10% engine load for 5 minutes per test with no generator load attached assumed for normal testing of engines

** Maximum annual testing based on 1 hour for periodic normal testing an low load per unit per year.

1) Based on manufacturer's data at 10% load.

1a) Caterpillar C-175-16 Performance Data Sheet [DM8448] at 10% load

1b) Calculated based on fuel sulfur content and fuel use.

1c) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009

2) Based on the number of units operating for the specified time period

3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Table 2b
Equinix Data Center SV11 - Emergency Backup Generators
Emissions From Periodic Generator Full Load Testing - 9 Engines

Periodic Generator Full Load Testing*

Manufacturer/Model	**Caterpillar**
Engine	**C175-16**
Total No. Units	7
Engine Operating Load	***100%***
Generator Output (kW)	3,000
Load During Testing	100%
Max Engine Output (hp)	4,423
Fuel Use (gal/hr) at Load	213.2
Fuel Sulfur Content (%)	0.0015

Emission Testing Information

	Max. Daily Testing	**Maximum** Annual Testing**
No. Units Tested. =	7	7
Test Duration/Unit (min) =	240	60
Tests per Period/Unit =	1	15
Operation./Unit (hours) =	4	15
Total Operation (hours) =	28	105

Pollutant	**Emission[1] Factor (g/hp-hr)**	**Emission Rate per Unit (lb/hr)**	**Operational Maximum Emissions per Unit** Daily (lb/day)	Annual (lb/yr)	Annual (ton/yr)	**Operational - Total Emissions[2]** Daily Maximum (lb/day)	Annual (lb/yr)	Annual (ton/yr)
NOx[1a]	7.29	71.09	284.34	1066.3	0.53	1990.39	7,464.0	3.73
HC[1a]	0.06	0.59	2.34	8.8	0.00	16.38	61.4	0.03
CO[1a]	0.60	5.85	23.40	87.8	0.04	163.82	614.3	0.31
PM10[1a]	0.04	0.39	1.56	5.9	0.0029	10.92	41.0	0.020
PM2.5[3]	0.04	0.37	1.46	5.5	0.0027	10.23	38.4	0.019
SOx[1c]	-	0.045	0.180	0.7	0.0003	1.26	4.7	0.0024
CO_2[1d]	22.38 lb/gal	4,771	19,083	71,561	35.8	133,580	500,925	250

Notes: * Emissions at 100% engine load for 1 hour per month plus an additional 3 hours at full load per year.
** Maximum annual generator load testing based on 15 hours of generator load testing per unit per year.
1) Based on manufacturer's data at 100% load.
1a) Caterpillar C-175-16 Performance Data Sheet [DM8448] at 10% load
1b) Calculated based on fuel sulfur content and fuel use.
1c) CO_2 emission factor from California Climate Action Registry, General Reporting Protocol, Version 3.1, January 2009
2) Based on the number of units operating for the specified time period
3) Based on CARB CEIDERS PM profile for diesel IC engines, PM2.5 fraction of PM = 0.937

Table 2c
Equinix Data Center SV11 - Emergency Backup Generators
Average Daily and Annual Emissions From All Generator Testing

Pollutant	**Operational - Total Emissions** Average* Daily (lb/day)	Annual Maximum (lb/yr)	Annual Maximum (ton/yr)
NOx	20.6	7,515.6	3.76
ROG	0.18	66.8	0.03
CO	1.76	642.5	0.32
PM10	0.12	42.9	0.02
PM2.5	0.11	40.2	0.02
SOx	0.01	4.8	0.00
CO_2	1393	508,427	254

* Average daily emissions calculated from total annual emissions and 365 days per year

Equinix SV-10 and SV-11 Data Centers - Emergency Generators
Source Parameters for Emergency Diesel-Fueled Generators

SV-10 & SV-11

Source	Load	Stack height (ft)	Stack Diam (in)	Temp (F)	Volume Flow (scfm)	Volume Flow (acfm)	Velocity (ft/min)	Velocity (ft/sec)
Generators 1 - 7	100%	17	18	895	-	24,561	13899	231.6
Generators 1 - 7	10%	17	18	696	-	7,713	4365	72.7

Source	Load	Stack height (m)	Stack Diam (m)	Temp (K)	Velocity (m/sec)
Generators 1 - 7	100%	5.18	0.457	752.5	70.61
Generators 1 - 7	10%	5.18	0.457	642.1	22.17

SV-1 and SV-5 PM Emissions for Modeling
Based on BAAQMD Permit to Operate B4676 for Plant # 14676, Oct 16, 2014

Data Center	Source Number	Description	Daily PM Emissions (lb/day)	Annual PM Emissions (lb/year)	Annualized Hourly PM for Modeling*** (lb/hr)	(g/s)
SV-1	1	Standby diesel engine, 1000 hp - Caterpillar model 3412	0.04	14.6	0.00444	0.000560
	2	Standby diesel engine, 1000 hp - Caterpillar model 3412	0.03	10.95	0.00333	0.000420
	3	Standby diesel engine, 1000 hp - Caterpillar model 3412	0.03	10.95	0.00333	0.000420
	4	Standby diesel engine, 2700 hp - Caterpillar model 3516B	0.03	10.95	0.00333	0.000420
	5	Standby diesel engine, 2700 hp - Caterpillar model 3516B	0.04	14.6	0.00444	0.000560
	6	Standby diesel engine, 2700 hp - Caterpillar model 3516B	0.03	10.95	0.00333	0.000420
	7	Standby diesel engine, 2700 hp - Caterpillar model 3516B	0.03	10.95	0.00333	0.000420
SV-5	8*	Standby diesel engine, 4423 hp - Caterpillar	0.01	3.65	0.00111	0.000140
	9*	Standby diesel engine, 4423 hp - Caterpillar	0.01	3.65	0.00111	0.000140
	10*	Standby diesel engine, 4423 hp - Caterpillar	0.01	3.65	0.00111	0.000140
	11	Standby diesel engine, 4423 hp - Caterpillar	0.02	7.3	0.00222	0.000280
	12	Standby diesel engine, 4423 hp - Caterpillar	0.01	3.65	0.00111	0.000140
	13	Standby diesel engine, 4423 hp - Caterpillar	0.02	7.3	0.00222	0.000280
	14**	Standby diesel engine, 4423 hp - Caterpillar	0.02	7.3	0.00222	0.000280

Notes: * Emissions reported as "-". Emissions assumed to be at minimum reporting value of 0.01 lb/day.

** Source not included in PTO inventory. Emissions assumed to be equal to the highest reported value of other sources at SV-2 (0.02 lb/day)

*** Assumes generator testing occurs in daytime between 8 am - 5 pm

Equinix Data Center - DPM From Emergency Generators
Proposed SV-10 & SV-11 and Existing (SV-1 & SV-5) Plus Proposed
AERMOD Risk Modeling Parameters and Maximum DPM Concentration in Project Area
Future and Existing Residential Receptors

Receptor Information

Number of Receptors	409	
Receptor Height =	1.5 meters	
Receptor distances =	25 m grid	future residential area
	Variable	existing residences

Meteorological Conditions

San Jose Airport Hourly Met Data	2009-2013
Land Use Classification	Urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations - Receptor Height = 1.5 m

Meteorological Data Years	**DPM/PM2.5 Concentration ($\mu g/m^3$)**
	2015
2006-2010 Average	**0.0171**

Equinix Data Center - DPM From Emergency Generators
Proposed SV-10 & SV-11 and Existing (SV-1 & SV-5) Plus Proposed
AERMOD Risk Modeling Parameters and Maximum DPM Cancer Risk in Project Area
Future and Existing Residential Receptors

AERMOD Risk Modeling Parameters

Receptor Information

Number of Receptors	409	
Receptor Height =	1.5 meters	
Receptor distances =	25 m grid	future residential area
	Variable	existing residences

Meteorological Conditions

San Jose Airport Hourly Met Da	2009-2013
Land Use Classification	Urban
Wind speed =	variable
Wind direction =	variable

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

MEI Cancer Risk From SV-10 and SV-11 Operation
Future On-Site Residents

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.0039	0.05
2	1 - 2	10	0.0039	1.28
14	3 - 16	3	0.0039	1.42
14	17 - 30	1	0.0039	0.16
Total Increased Cancer Risk				**2.9**

* Third trimester of pregnancy

MEI Cancer Risk From SV-10 and SV-11 Operation
Existing Off-Site Residents

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.0007	0.01
2	1 - 2	10	0.0007	0.22
14	3 - 16	3	0.0007	0.24
14	17 - 30	1	0.0007	0.03
Total Increased Cancer Risk				**0.5**

* Third trimester of pregnancy

MEI Cancer Risk From Operation of All Data Centers (SV-1, SV-5, SV-10 and SV-11)
Future On-Site Residents

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.0061	0.08
2	1 - 2	10	0.0061	1.99
14	3 - 16	3	0.0061	2.20
14	17 - 30	1	0.0061	0.24
Total Increased Cancer Risk				**4.5**

* Third trimester of pregnancy

MEI Cancer Risk From Operation of All Data Centers (SV-1, SV-5, SV-10 and SV-11)
Existing Off-Site Residents

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.0023	0.03
2	1 - 2	10	0.0023	0.76
14	3 - 16	3	0.0023	0.84
14	17 - 30	1	0.0023	0.09
Total Increased Cancer Risk				**1.7**

* Third trimester of pregnancy

Image shown may not reflect actual package.

STANDBY
3000 ekW 3750 kVA
60 Hz 1800 rpm 480 Volts

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

FEATURES

FUEL/EMISSIONS STRATEGY
- EPA Certified for Stationary Emergency Application (EPA Tier 2 emissions levels)

DESIGN CRITERIA
- The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.

FULL RANGE OF ATTACHMENTS
- Wide range of bolt-on system expansion attachments, factory designed and tested
- Flexible packaging options for easy and cost effective installation

SINGLE-SOURCE SUPPLIER
- Fully prototype tested with certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT
- Cat dealers provide extensive post sale support including maintenance and repair agreements
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- The Cat® S•O•S℠ program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products

CAT® C175-16 DIESEL ENGINE
- Reliable and durable
- Four-stroke diesel engine combines superior performance with excellent fuel economy
- Advanced electronic engine control
- Low installation and operating cost

CAT GENERATOR
- Matched to the performance and output characteristics of Cat engines
- Industry leading mechanical and electrical design
- Industry leading motor starting capabilities
- High Efficiency

CAT EMCP 4 CONTROL PANELS
- Simple user friendly interface and navigation
- Scalable system to meet a wide range of customer needs
- Integrated Control System and Communications Gateway

SEISMIC CERTIFICATION
- Seismic Certification available
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength. IBC Certification requires that the anchoring system used is reviewed and approved by a Professional Engineer
- Seismic Certification per Applicable Building Codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007
- Pre-approved by OSHP and carries an OPA#(OSP-0084-01) for use in healthcare projects in California

FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	• Air cleaner, 4 x single element canister with service indicator(s) • Plug group for air inlet shut-off	[ ] Air cleaner, 4 x dual element with service indicator(s) [ ] Air inlet adapters
Circuit Breakers		[ ] Circuit breakers, UL 100% rated, 3 pole with shunt trip [ ] Circuit breakers, IEC rated, 3 or 4 pole with shunt
Cooling	• SCAC cooling • Jacket water and AC inlet/outlet flanges	[ ] Package mounted vertical SCAC radiator [ ] Remote horizontal SCAC radiator [ ] Remote fuel cooler
Crankcase Systems	• Open crankcase ventilation	[ ] Crankcase explosion relief valve
Exhaust	• Dry exhaust manifold • Bolted flange (ANSI 6" & DIN 150) with bellow for each turbo (qty 4)	[ ] Engine Exhaust Temperature Module [ ] Mufflers (15 dBA,25 dBA, or 40 dBA) [ ] Dual 16" or single 20" vertical exhaust collector [ ] Weld flange ANSI 20"
Fuel	• Primary fuel filter with water separator • Secondary fuel filters (engine mounted)	
Generator	• 3 phase brushless, salient pole • IEC platinum stator RTD's • Cat digital voltage regulator (CDVR)	[ ] Space heater [ ] Oversize generators [ ] Power connection arrangement
Governor	• ADEM™ A4	[ ] Redundant shutdown
Control Panels	• EMCP 4	[ ] Local & remote annunciator modules [ ] Digital I/O module [ ] Generator temperature monitoring & protection [ ] Remote monitoring software [ ] Load share module
Lube	• Lubricating oil • Oil filter, filler and dipstick • Oil drain line with valves • Fumes disposal • Electric prelube pumps • Integral lube oil cooler	
Mounting	• Rails-engine / generator • Rubber anti-vibration mounts (shipped loose)	[ ] Spring type linear vibration isolator [ ] IBC vibration isolators
Starting/Charging	• Dual 24 volt electric starting motors • Batteries with rack and cables • Battery disconnect switch	[ ] Oversize batteries [ ] 75 amp charging alternator [ ] Battery chargers (20,35 or 50 Amp) [ ] Jacket water heater [ ] Redundant Electric Starter
General	• RH service (Except LH Service Oil Filter) • Paint - Caterpillar Yellow with high gloss black rails • SAE standard rotation • Flywheel and flywheel housing - SAE No. 00	[ ] Barring group- manual or air powered [ ] Factory test reports

SPECIFICATIONS

CAT GENERATOR

Frame size..... 1868
Excitation..... Permanent Magnet
Pitch..... 0.6667
Number of poles..... 4
Number of bearings..... 2
Number of Leads..... 006
Insulation..... UL 1446 Recognized Class H with tropicalization and antiabrasion
- Consult your Caterpillar dealer for available voltages
IP Rating..... IP23
Alignment..... Closed Coupled
Overspeed capability..... 125
Wave form Deviation (Line to Line)..... 5%
Voltage regulator..... 3 Phase sensing with selectible volts/Hz
Voltage regulation..... Less than +/- 1/2% (steady state)
Less than +/- 1/2% (with 3% speed change)

CAT DIESEL ENGINE

C175 SCAC, V-16, 4-Stroke Water-cooled Diesel
Bore..... 175.00 mm (6.89 in)
Stroke..... 220.00 mm (8.66 in)
Displacement..... 84.67 L (5166.88 in^3)
Compression Ratio..... 15.3:1
Aspiration..... Turbo Aftercooled
Fuel System..... Common Rail
Governor Type..... ADEM™ A4

CAT EMCP 4 SERIES CONTROLS

EMCP 4 controls including:
- Run / Auto / Stop Control
- Speed and Voltage Adjust
- Engine Cycle Crank
- 24-volt DC operation
- Environmental sealed front face
- Text alarm/event descriptions

Digital indication for:
- RPM
- DC volts
- Operating hours
- Oil pressure (psi, kPa or bar)
- Coolant temperature
- Volts (L-L & L-N), frequency (Hz)
- Amps (per phase & average)
- ekW, kVA, kVAR, kW-hr, %kW, PF

Warning/shutdown with common LED indication of:
- Low oil pressure
- High coolant temperature
- Overspeed
- Emergency stop
- Failure to start (overcrank)
- Low coolant temperature
- Low coolant level

Programmable protective relaying functions:
- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under Frequency (81 o/u)
- Reverse Power (kW) (32)
- Reverse reactive power (kVAr) (32RV)
- Overcurrent (50/51)

Communications:
- Six digital inputs (4.2 only)
- Four relay outputs (Form A)
- Two relay outputs (Form C)
- Two digital outputs
- Customer data link (Modbus RTU)
- Accessory module data link
- Serial annunciator module data link
- Emergency stop pushbutton

Compatible with the following:
- Digital I/O module
- Local Annunciator
- Remote CAN annunciator
- Remote serial annunciator

STANDBY 3000 ekW 3750 kVA

60 Hz 1800 rpm 480 Volts

TECHNICAL DATA

Open Generator Set - - 1800 rpm/60 Hz/480 Volts	DM8448	
EPA Certified for Stationary Emergency Application (EPA Tier 2 emissions levels)		
Generator Set Package Performance		
Genset Power rating @ 0.8 pf	3750 kVA	
Genset Power rating with fan	3000 ekW	
Fuel Consumption		
100% load with fan	810.7 L/hr	214.2 Gal/hr
75% load with fan	625.8 L/hr	165.3 Gal/hr
50% load with fan	493.6 L/hr	130.4 Gal/hr
Cooling System[1]		
Air flow restriction (system)	0.12 kPa	0.48 in. water
Engine coolant capacity	303.5 L	80.2 gal
Inlet Air		
Combustion air inlet flow rate	276.7 m^3/min	9771.6 cfm
Exhaust System		
Exhaust system backpressure (maximum allowable)	6.7 kPa	26.9 in. water

Alternator[2]		
Motor starting capability @ 30% voltage dip	7322 skVA	
Frame	1866	
Temperature Rise	150 ° C	270 ° F

[1] For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.
[2] UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40 degree C ambient per NEMA MG1-32.
[3] Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77ºF, 28.42 in HG and number 2 diesel fuel with 35º API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

RATING DEFINITIONS AND CONDITIONS

Meets or Exceeds International Specifications: AS1359, CSA, IEC60034-1, ISO3046, ISO8528, NEMA MG 1-22, NEMA MG 1-33, UL508A, 72/23/EEC, 98/37/EC, 2004/108/EC

Standby - Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year. Standby power in accordance with ISO8528. Fuel stop power in accordance with ISO3046. Standby ambients shown indicate ambient temperature at 100% load which results in a coolant top tank temperature just below the shutdown temperature.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions.

Fuel rates are based on fuel oil of 35° API [16° C (60° F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.). Additional ratings may be available for specific customer requirements, contact your Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

STANDBY 3000 ekW 3750 kVA

60 Hz 1800 rpm 480 Volts

DIMENSIONS

Package Dimensions		
Length	6631.6 mm	261.09 in
Width	2089.4 mm	82.26 in
Height	2207.9 mm	86.93 in

NOTE: For reference only - do not use for installation design. Please contact your local dealer for exact weight and dimensions. (General Dimension Drawing #3269431).

Performance No.: DM8448

Feature Code: 175DE09

Gen. Arr. Number: 3111146

Source: U.S. Sourced

May 08 2012 20069812

www.Cat-ElectricPower.com

PERFORMANCE DATA[DM8448]

August 27, 2014

Performance Number: DM8448 **Change Level: 07**

SALES MODEL:	C175-16	**COMBUSTION:**	DI
ENGINE POWER (BHP):	4,423	**ENGINE SPEED (RPM):**	1,800
GEN POWER WITH FAN (EKW):	3,000.0	**HERTZ:**	60
COMPRESSION RATIO:	15.3	**FAN POWER (HP):**	187.7
RATING LEVEL:	STANDBY	**ASPIRATION:**	TA
PUMP QUANTITY:	2	**AFTERCOOLER TYPE:**	SCAC
FUEL TYPE:	DIESEL	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC+1AC, 2AC
MANIFOLD TYPE:	DRY	**AFTERCOOLER TEMP (F):**	115
GOVERNOR TYPE:	ADEM4	**JACKET WATER TEMP (F):**	210.2
ELECTRONICS TYPE:	ADEM4	**TURBO CONFIGURATION:**	PARALLEL
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	4
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	GTB6251BN-48T-1.38
INJECTOR TYPE:	CR	**CERTIFICATION YEAR:**	2008
FUEL INJECTOR:	3492522	**CRANKCASE BLOWBY RATE (FT3/HR):**	2,436.4
REF EXH STACK DIAMETER (IN):	14	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	25.1
		PISTON SPD @ RATED ENG SPD (FT/MIN):	2,598.4

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET

General Performance Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
3,000.0	100	4,423	377	0.338	213.2	91.9	121.6	1,210.6	63.1	894.9
2,700.0	90	3,999	341	0.335	191.1	82.0	121.3	1,161.6	54.8	876.2
2,400.0	80	3,576	305	0.336	171.6	73.8	121.1	1,122.7	48.2	861.4
2,250.0	75	3,364	286	0.339	162.8	70.4	121.1	1,106.9	45.6	855.4
2,100.0	70	3,152	268	0.345	155.5	68.2	121.2	1,096.9	43.9	851.5
1,800.0	60	2,729	232	0.365	142.4	64.4	121.4	1,082.2	41.4	845.8
1,500.0	50	2,305	196	0.392	129.2	59.9	121.6	1,068.3	38.7	841.0
1,200.0	40	1,882	160	0.419	112.6	50.1	121.2	1,043.7	32.5	833.2
900.0	30	1,458	124	0.448	93.3	38.6	120.8	1,011.1	25.6	823.3
750.0	25	1,246	106	0.465	82.9	32.6	120.7	992.4	22.1	817.8
600.0	20	1,035	88	0.486	71.8	26.5	120.7	956.4	18.6	799.8
300.0	10	611	52	0.549	47.9	14.1	121.1	792.3	11.6	696.1

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
3,000.0	100	4,423	91	449.9	9,354.6	24,561.2	41,178.2	42,670.8	8,914.9	8,125.8
2,700.0	90	3,999	82	413.5	8,669.4	22,333.8	37,919.5	39,258.2	8,219.9	7,506.8
2,400.0	80	3,576	74	383.9	8,104.4	20,515.6	35,241.7	36,443.9	7,635.4	6,989.2
2,250.0	75	3,364	70	371.6	7,867.0	19,759.9	34,120.5	35,261.2	7,387.5	6,771.0
2,100.0	70	3,152	68	364.5	7,728.5	19,298.5	33,455.9	34,545.6	7,236.5	6,643.0
1,800.0	60	2,729	64	353.0	7,492.6	18,546.1	32,341.4	33,337.7	6,984.7	6,432.9
1,500.0	50	2,305	60	338.7	7,182.4	17,661.1	30,929.1	31,831.8	6,676.1	6,168.3
1,200.0	40	1,882	50	308.4	6,446.9	15,853.5	27,583.4	28,376.7	6,029.1	5,577.3
900.0	30	1,458	39	267.3	5,556.6	13,501.7	23,627.7	24,286.8	5,174.3	4,794.1
750.0	25	1,246	33	243.4	5,078.3	12,165.9	21,540.3	22,123.2	4,682.6	4,345.1
600.0	20	1,035	27	217.5	4,586.9	10,746.2	19,412.2	19,914.7	4,195.0	3,902.4
300.0	10	611	14	160.7	3,587.5	7,713.3	15,115.2	15,450.4	3,281.3	3,076.1

Heat Rejection Data

PUMP POWER IS INCLUDED IN HEAT REJECTION BALANCE, BUT IS NOT SHOWN.

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHUAST RECOVERY TO 350F	FROM OIL COOLER	FROM 2ND STAGE AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
3,000.0	100	4,423	78,059	10,340	177,889	98,540	24,373	27,992	187,548	457,607	487,466
2,700.0	90	3,999	69,753	9,728	158,027	87,354	21,844	22,735	169,590	410,123	436,884
2,400.0	80	3,576	62,813	9,257	142,134	78,630	19,611	18,646	151,631	368,192	392,217
2,250.0	75	3,364	59,856	9,074	135,676	75,107	18,605	17,040	142,651	349,309	372,102
2,100.0	70	3,152	57,689	8,964	131,604	72,930	17,781	16,060	133,672	333,838	355,621
1,800.0	60	2,729	54,062	8,823	125,449	69,433	16,278	14,739	115,714	305,626	325,568
1,500.0	50	2,305	50,534	8,716	119,331	65,520	14,768	13,646	97,755	277,263	295,355
1,200.0	40	1,882	45,771	8,538	108,948	57,374	12,870	11,188	79,796	241,627	257,393
900.0	30	1,458	39,630	8,265	94,183	48,019	10,669	8,349	61,838	200,308	213,378
750.0	25	1,246	36,078	8,096	85,285	43,193	9,471	7,028	52,858	177,821	189,424
600.0	20	1,035	31,984	7,842	74,947	37,306	8,207	5,910	43,879	154,087	164,142
300.0	10	611	21,612	6,922	48,843	22,014	5,475	4,318	25,920	102,790	109,497

Sound Data

SOUND DATA REPRESENTATIVE OF NOISE PRODUCED BY THE "ENGINE ONLY"

EXHAUST: Sound Power (1/3 Octave Frequencies)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	134.5	109.7	115.8	113.7	115.5	116.0	119.0	119.9	121.5	120.4	121.2
2,700.0	90	3,999	133.2	110.2	116.1	112.6	114.3	114.5	117.3	118.4	120.1	118.3	119.5
2,400.0	80	3,576	132.0	111.6	116.6	111.0	112.7	113.0	115.6	116.9	118.4	116.5	117.7
2,250.0	75	3,364	131.4	112.4	116.8	110.2	111.9	112.3	114.8	116.2	117.6	115.6	116.8
2,100.0	70	3,152	130.7	113.2	117.1	109.3	111.1	111.6	114.0	115.5	116.8	114.7	115.9
1,800.0	60	2,729	129.5	114.8	117.6	107.5	109.4	110.2	112.3	114.1	115.1	113.0	114.0
1,500.0	50	2,305	128.2	116.3	118.1	105.8	107.8	108.7	110.6	112.6	113.4	111.2	112.2
1,200.0	40	1,882	127.0	117.9	118.6	104.1	106.1	107.3	108.9	111.2	111.8	109.5	110.3
900.0	30	1,458	125.7	119.5	119.1	102.3	104.4	105.9	107.3	109.8	110.1	107.7	108.5
750.0	25	1,246	125.1	120.2	119.3	101.4	103.6	105.2	106.4	109.1	109.3	106.8	107.6
600.0	20	1,035	124.4	121.0	119.6	100.6	102.8	104.5	105.6	108.4	108.4	105.9	106.7
300.0	10	611	123.2	122.6	120.0	98.8	101.1	103.0	103.9	106.9	106.8	104.2	104.8

EXHAUST: Sound Power (1/3 Octave Frequencies)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	122.2	122.6	123.5	124.9	124.7	123.1	122.4	121.6	120.1	119.0	123.4
2,700.0	90	3,999	120.7	121.0	122.2	123.5	123.2	121.5	120.8	120.0	118.7	117.8	123.8
2,400.0	80	3,576	119.4	119.7	120.8	122.5	121.9	120.4	119.8	119.0	117.7	117.1	123.5
2,250.0	75	3,364	118.8	119.1	120.1	122.0	121.3	119.9	119.4	118.6	117.2	116.8	123.3
2,100.0	70	3,152	118.1	118.5	119.4	121.5	120.6	119.3	119.0	118.2	116.7	116.5	123.1
1,800.0	60	2,729	116.9	117.3	118.0	120.4	119.4	118.3	118.1	117.3	115.6	115.9	122.6
1,500.0	50	2,305	115.6	116.2	116.6	119.4	118.1	117.3	117.2	116.4	114.6	115.3	122.1
1,200.0	40	1,882	114.3	115.0	115.1	118.4	116.8	116.3	116.4	115.6	113.6	114.7	121.6
900.0	30	1,458	113.1	113.8	113.7	117.4	115.6	115.3	115.5	114.7	112.6	114.1	121.1
750.0	25	1,246	112.4	113.2	113.0	116.9	114.9	114.8	115.1	114.3	112.1	113.8	120.9
600.0	20	1,035	111.8	112.6	112.3	116.4	114.3	114.2	114.7	113.9	111.6	113.5	120.7
300.0	10	611	110.5	111.4	110.9	115.4	113.0	113.2	113.8	113.0	110.6	112.9	120.2

PERFORMANCE DATA[DM8448]

Sound Data (Continued)

MECHANICAL: Sound Power (1/3 Octave Frequencies)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	125.9	89.8	105.6	98.4	100.6	104.5	108.3	111.6	113.3	112.5	114.1
2,700.0	90	3,999	125.8	89.4	105.5	97.9	100.9	103.3	108.7	111.1	112.7	112.2	113.8
2,400.0	80	3,576	126.0	89.0	105.0	97.8	99.8	102.4	108.0	111.0	111.8	111.9	113.0
2,250.0	75	3,364	126.1	88.8	104.7	97.8	99.1	102.1	107.5	111.0	111.3	111.7	112.6
2,100.0	70	3,152	126.2	88.5	104.3	97.8	98.4	101.7	107.0	111.0	110.8	111.6	112.2
1,800.0	60	2,729	126.5	88.1	103.7	97.8	96.9	100.9	106.0	111.0	109.8	111.2	111.4
1,500.0	50	2,305	126.7	87.7	103.0	97.8	95.4	100.2	105.1	111.0	108.8	110.9	110.5
1,200.0	40	1,882	127.0	87.3	102.4	97.7	94.0	99.4	104.1	110.9	107.8	110.6	109.7
900.0	30	1,458	127.2	86.9	101.7	97.7	92.5	98.6	103.1	110.9	106.8	110.2	108.9
750.0	25	1,246	127.3	86.7	101.4	97.7	91.8	98.2	102.6	110.9	106.3	110.1	108.5
600.0	20	1,035	127.4	86.4	101.0	97.7	91.0	97.9	102.1	110.9	105.8	109.9	108.1
300.0	10	611	127.7	86.0	100.4	97.7	89.6	97.1	101.2	110.9	104.8	109.6	107.2

MECHANICAL: Sound Power (1/3 Octave Frequencies)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	112.7	113.9	114.6	115.3	115.0	112.7	110.9	111.9	114.3	113.4	117.8
2,700.0	90	3,999	112.5	113.7	114.5	115.0	114.5	112.3	110.4	111.1	113.6	112.9	119.2
2,400.0	80	3,576	112.2	113.2	113.8	114.4	114.2	111.9	110.0	110.7	113.2	112.6	121.4
2,250.0	75	3,364	112.0	112.9	113.4	114.0	114.2	111.7	109.8	110.5	112.9	112.6	122.6
2,100.0	70	3,152	111.8	112.6	113.0	113.7	114.1	111.4	109.6	110.3	112.7	112.5	123.8
1,800.0	60	2,729	111.3	112.1	112.2	113.1	113.9	111.0	109.3	110.0	112.3	112.3	126.2
1,500.0	50	2,305	110.9	111.5	111.4	112.4	113.7	110.6	109.0	109.6	111.9	112.1	128.6
1,200.0	40	1,882	110.5	110.9	110.5	111.7	113.5	110.2	108.6	109.3	111.5	111.9	131.0
900.0	30	1,458	110.1	110.3	109.7	111.1	113.4	109.8	108.3	109.0	111.0	111.8	133.4
750.0	25	1,246	109.9	110.0	109.3	110.7	113.3	109.6	108.1	108.8	110.8	111.7	134.6
600.0	20	1,035	109.7	109.7	108.9	110.4	113.2	109.3	107.9	108.6	110.6	111.6	135.8
300.0	10	611	109.3	109.2	108.1	109.7	113.0	108.9	107.6	108.3	110.2	111.4	138.2

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN		EKW	3,000.0	2,250.0	1,500.0	750.0	300.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	4,423	3,364	2,305	1,246	611
TOTAL NOX (AS NO2)		G/HR	32,120	21,539	9,430	3,810	3,351
TOTAL CO		G/HR	2,658	3,451	1,789	1,814	1,830
TOTAL HC		G/HR	245	185	358	385	347
PART MATTER		G/HR	160.9	170.2	122.6	134.5	129.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,723.8	3,345.5	1,874.3	1,261.1	2,241.5
TOTAL CO	(CORR 5% O2)	MG/NM3	268.6	462.8	302.2	502.2	1,002.8
TOTAL HC	(CORR 5% O2)	MG/NM3	20.9	21.5	53.3	95.7	161.8
PART MATTER	(CORR 5% O2)	MG/NM3	14.0	19.8	18.4	33.9	64.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,814	1,630	913	614	1,092
TOTAL CO	(CORR 5% O2)	PPM	215	370	242	402	802
TOTAL HC	(CORR 5% O2)	PPM	39	40	100	179	302
TOTAL NOX (AS NO2)		G/HP-HR	7.29	6.42	4.09	3.05	5.47
TOTAL CO		G/HP-HR	0.60	1.03	0.78	1.45	2.99
TOTAL HC		G/HP-HR	0.06	0.06	0.16	0.31	0.57
PART MATTER		G/HP-HR	0.04	0.05	0.05	0.11	0.21
TOTAL NOX (AS NO2)		LB/HR	70.81	47.49	20.79	8.40	7.39
TOTAL CO		LB/HR	5.86	7.61	3.94	4.00	4.03
TOTAL HC		LB/HR	0.54	0.41	0.79	0.85	0.76
PART MATTER		LB/HR	0.35	0.38	0.27	0.30	0.29

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN		EKW	3,000.0	2,250.0	1,500.0	750.0	300.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	4,423	3,364	2,305	1,246	611
TOTAL NOX (AS NO2)		G/HR	26,766	17,949	7,858	3,175	2,792
TOTAL CO		G/HR	1,477	1,917	994	1,008	1,017
TOTAL HC		G/HR	184	139	269	289	261
TOTAL CO2		KG/HR	2,236	1,651	1,287	779	428
PART MATTER		G/HR	115.0	121.5	87.6	96.1	92.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,103.2	2,787.9	1,561.9	1,050.9	1,867.9
TOTAL CO	(CORR 5% O2)	MG/NM3	149.2	257.1	167.9	279.0	557.1
TOTAL HC	(CORR 5% O2)	MG/NM3	15.7	16.2	40.1	72.0	121.7
PART MATTER	(CORR 5% O2)	MG/NM3	10.0	14.2	13.1	24.2	45.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,512	1,358	761	512	910
TOTAL CO	(CORR 5% O2)	PPM	119	206	134	223	446
TOTAL HC	(CORR 5% O2)	PPM	29	30	75	134	227
TOTAL NOX (AS NO2)		G/HP-HR	6.07	5.35	3.41	2.55	4.56
TOTAL CO		G/HP-HR	0.34	0.57	0.43	0.81	1.66
TOTAL HC		G/HP-HR	0.04	0.04	0.12	0.23	0.43
PART MATTER		G/HP-HR	0.03	0.04	0.04	0.08	0.15
TOTAL NOX (AS NO2)		LB/HR	59.01	39.57	17.32	7.00	6.16
TOTAL CO		LB/HR	3.26	4.23	2.19	2.22	2.24
TOTAL HC		LB/HR	0.41	0.31	0.59	0.64	0.57
TOTAL CO2		LB/HR	4,930	3,639	2,836	1,717	943
PART MATTER		LB/HR	0.25	0.27	0.19	0.21	0.20
OXYGEN IN EXH		%	9.6	10.2	11.6	12.7	14.5
DRY SMOKE OPACITY		%	0.7	1.0	0.3	0.8	1.8
BOSCH SMOKE NUMBER			0.25	0.36	0.13	0.29	0.62

Regulatory Information

EPA TIER 2		2006 - 2010		
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	**Agency**	**Regulation**	**Tier/Stage**	**Max Limits - G/BKW - HR**
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY		2011 - ----		
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.				
Locality	**Agency**	**Regulation**	**Tier/Stage**	**Max Limits - G/BKW - HR**
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data

ALTITUDE DERATE DATA IS BASED ON THE ASSUMPTION OF A 20 DEGREES CELSIUS(36 DEGREES FAHRENHEIT) DIFFERENCE BETWEEN AMBIENT OPERATING TEMPERATURE AND ENGINE INLET MANIFOLD TEMPERATURE (IMAT). AMBIENT OPERATING TEMPERATURE IS DEFINED AS THE AIR TEMPERATURE MEASURED AT THE TURBOCHARGER COMPRESSOR INLET.

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)													
0	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,413	4,423
1,000	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,362	4,423
2,000	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,382	4,323	4,233	4,423
3,000	4,360	4,360	4,360	4,360	4,360	4,360	4,360	4,360	4,359	4,294	4,200	4,107	4,360
4,000	4,185	4,185	4,185	4,185	4,185	4,185	4,184	4,183	4,181	4,139	4,080	4,021	4,185
5,000	4,019	4,019	4,019	4,019	4,019	4,019	4,018	4,016	4,013	3,992	3,964	3,935	4,019
6,000	3,867	3,867	3,867	3,867	3,867	3,867	3,866	3,862	3,859	3,853	3,846	3,839	3,867
7,000	3,747	3,747	3,747	3,747	3,747	3,747	3,745	3,741	3,737	3,732	3,725	3,719	3,747
8,000	3,626	3,626	3,626	3,626	3,626	3,626	3,624	3,620	3,616	3,610	3,604	3,598	3,626
9,000	3,514	3,514	3,514	3,514	3,514	3,514	3,512	3,508	3,504	3,498	3,493	3,487	3,514
10,000	3,409	3,409	3,409	3,409	3,409	3,409	3,407	3,403	3,399	3,394	3,389	3,383	3,409
11,000	3,304	3,304	3,304	3,304	3,304	3,304	3,302	3,298	3,294	3,289	3,285	3,280	3,304
12,000	3,199	3,199	3,199	3,199	3,199	3,199	3,197	3,193	3,189	3,185	3,181	3,176	3,199
13,000	3,113	3,113	3,113	3,113	3,113	3,113	3,111	3,108	3,105	3,101	3,098	3,095	3,113
14,000	3,030	3,030	3,030	3,030	3,030	3,030	3,029	3,027	3,025	3,022	3,020	3,018	3,030
15,000	2,948	2,948	2,948	2,948	2,948	2,948	2,947	2,946	2,944	2,943	2,942	2,940	2,948

Cross Reference

Engine Arrangement			
Arrangement Number	**Effective Serial Number**	**Engineering Model**	**Engineering Model Version**
3079788	WYB00620	GS265	-

Test Specification Data						
Test Spec	**Setting**	**Effective Serial Number**	**Engine Arrangement**	**Governor Type**	**Default Low Idle Speed**	**Default High Idle Speed**
0K8532	LL6018	WYB00620	3079788	ADEM4		

Performance Parameter Reference

Parameters Reference:DM9600-06

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION:
Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS:

Power	+/- 3%
Torque	+/- 3%
Exhaust stack temperature	+/- 8%
Inlet airflow	+/- 5%
Intake manifold pressure-gage	+/- 10%
Exhaust flow	+/- 6%
Specific fuel consumption	+/- 3%
Fuel rate	+/- 5%
Specific DEF consumption	+/- 3%
DEF rate	+/- 5%
Heat rejection	+/- 5%
Heat rejection exhaust only	+/- 10%
Heat rejection CEM only	+/- 10%

Heat Rejection values based on using treated water.

Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.

On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.

These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS:

Heat rejection	+/- 10%
Heat rejection to Atmosphere	+/- 50%
Heat rejection to Lube Oil	+/- 20%
Heat rejection to Aftercooler	+/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS:

Torque	+/- 0.5%
Speed	+/- 0.2%
Fuel flow	+/- 1.0%
Temperature	+/- 2.0 C degrees
Intake manifold pressure	+/- 0.1 kPa

OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR

FOR 3500 ENGINES AND SMALLER
SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.

FOR 3600 ENGINES
Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler

water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE
Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER
The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL

DIESEL
Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29 (84.2), where the density is 838.9 G/Liter (7.001 Lbs/Gal).

GAS
Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD
Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY
Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set. Standard temperature values versus altitude could be seen on TM2001. When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.

Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001. Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE
TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative. Log on to the Technology and Solutions Divisions (T&SD) web page (https://pdgt.cat.com/cda/layout) for information including federal regulation applicability and time lines for implementation. Information for labeling and tagging requirements is also provided.

NOTES:
Regulation watch covers regulations in effect and future regulation changes for world, federal, state and local. This page includes

items on the watch list where a regulation change or product change might be pending and may need attention of the engine product group. For additional emissions information log on to the TMI web page.

Additional product information for specific market application is available.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

HEAT REJECTION DEFINITIONS:
Diesel Circuit Type and HHV Balance : DM9500

EMISSIONS DEFINITIONS:
Emissions : DM1176

SOUND DEFINITIONS:
Sound Power : DM8702

Sound Pressure : TM7080

RATING DEFINITIONS:
Agriculture : TM6008

Fire Pump : TM6009

Generator Set : TM6035

Generator (Gas) : TM6041

Industrial Diesel : TM6010

Industrial (Gas) : TM6040

Irrigation : TM5749

Locomotive : TM6037

Marine Auxiliary : TM6036

Marine Prop (Except 3600) : TM5747

Marine Prop (3600 only) : TM5748

MSHA : TM6042

Oil Field (Petroleum) : TM6011

Off-Highway Truck : TM6039

On-Highway Truck : TM6038

Date Released : 5/12/14

ENGINE CONTROLLER

ADEM™ A4 Engine Controller

The ADEM™ A4 is the main Electronic Control Module (ECM) used on select diesel engines. The ADEM A4 provides a higher degree of control over a large number of combustion variables. The ADEM A4 is designed to control/interface Electronic Unit Injector (EUI) equipped engines. The ADEM A4 engine system is composed of the ADEM A4 ECM, control software, sensors, actuators, fuel injectors, and interface to the generator system. The prime benefit of an ADEM A4 engine system is to better control and maintain the particulate emissions, both steady state and transient, while improving engine performance

FEATURES

RELIABLE, DURABLE

All ADEM A4 controllers are designed to survive the harshest environments.

- Environmentally sealed, die-cast aluminum housing isolates and protects electronic components from moisture and dirt contamination.
- Rigorous vibration testing ensures product reliability and durability.
- Accuracy maintained from –40° C to 85° C
- Electrical noise immunity to 100 volts/meter
- Internal circuits are designed to withstand shorts to +battery and –battery.

SIMPLE SERVICING

Each ADEM A4 system works in combination with the Cat® ET service tool software to keep the engine operating at peak performance.

- Displays measured parameters
- Retrieves active and logged event code documenting abnormal system operation
- Performs calibrations and diagnostic tests
- Supports flash programming of new software into the ADEM A4 ECM

SELF DIAGNOSTICS

Each ADEM A4 ECM has a full compliment of diagnostics. The ECM can detect faults in the electrical system and report those faults to the service technician for quick repair.

- Self-diagnostic capability pinpoints operational problems in need of attention.

ADVANCED FEATURES

- Enhanced performance from fuel injection timing and limiting
- Adjustable monitoring of vital engine parameters
- Programmable speed acceleration ramp rate
- Data link interfaces

ENGINE CONTROLLER

DESCRIPTION

The ECM is housed in an environmentally sealed casting. All wiring connections to the ECM are made using two sealed connectors: a single seventy-pin connector and a single one hundred twenty-pin connector.

ENGINE SPEED GOVERNING

Desired engine speed is calculated by the ECM and held within ±0.2 Hz for isochronous and droop mode. The ECM accounts for droop that is requested. The proper amount of fuel is sent to the injectors due to these calculations. The ECM also employs cooldown/shutdown strategies, acceleration delays on startup, acceleration ramp times and speed reference.

FUEL LIMITING

Warm and cold fuel-air ratio control limits are controlled by the ECM. Electronic monitoring system derates, torque limit, and cranking limit, programmable torque scaling, and cold cylinder cutout mode are standard features.

FUEL INJECTION TIMING

Master timing for injection is controlled by the ECM control. Temperature dependencies are accounted for in the fuel injection calculations.

ELECTRONIC MONITORING

Electronic monitoring of vital engine parameters can be programmed. Warning, derate, and shutdown event conditions may be customized by the user.

INFORMATION MANAGEMENT

The ECM stores information to assist with electronic troubleshooting. Active and logged diagnostic codes, active events, logged events, fuel consumption, engine hours, and instantaneous totals aid service technicians when diagnosing electronic faults and scheduling preventive maintenance.

CALIBRATIONS

Engine performance is optimized through injection timing. Auto/manual sensor calibrations are standard features.

ON-BOARD SYSTEM TESTS

System tests are available to assist in electronic troubleshooting. These tests include: injector activation, injector cutout, and override of control outputs.

DATA LINK INTERFACES

The ADEM A4 communicates with the EMCP via a dedicated communication network.

ELECTRONIC SENSING

The following sensing is available on the ADEM A4: oil pressure, fuel pressure, fuel temperature, atmospheric pressure, air inlet temperature, turbo outlet pressure, engine coolant temperature, engine speed, throttle, position, exhaust temperature, oil filter pressure differential, fuel filter pressure differential, air filter pressure differential and crankcase pressure.

ENGINE CONTROLLER

SPECIFICATIONS

Impervious to:
salt spray, fuel, oil and oil additives, coolant, spray cleaners, chlorinated solvents, hydrogen sulfide and methane gas, and dust

Input and output protection
all inputs and outputs are protected against short circuits to +battery and –battery

Input voltage range (24 VDC nominal)
18 to 32 VDC

Mounting
engine mounted

Reverse polarity protected

Shock, withstands 20 g

Temperature range
Operating: –40° C to 85° C (–40° F to 185° F)
Storage: –50° C to 120° C (–58° F to 248° F)

Vibration
withstands 8.0 g @ 24 to 2 kHz

Image shown may not reflect actual product

1800 Frame

Standby Power

50 Hz 2500-3100 kVA	1500 rpm
60 Hz 2500-3100 ekW	**1800 rpm**

Prime Power

50 Hz 2275-2825 kVA	1500 rpm
60 Hz 2250-2825 ekW	1800 rpm

Continuous Power

50 Hz 2000-2600 kVA	1500 rpm
60 Hz 2050-2600 ekW	1800 rpm

FEATURES

GENERAL

- Standards: meets the requirements of NEMA, IEC, ISO, IEEE, BS, AS
- Industry leading insulation technology
- Proven mechanical and electrical design
- Reliable and durable construction
- Improved excitation system for high power quality
- Improved motor starting capability
- Radio frequency noise suppression better than industry standards
- Superior construction and testing

STANDARD

- 3 phase brushless, salient pole
- NEMA Class H insulation
- Class H temperature rise 40 ° ambient
- 2/3 winding pitch
- Form Wound
- Standard voltages:
  60 Hz: 480V, 4160V
  50 Hz: 400V, 3300V
- Bus bar connections
  60 Hz models: NEMA standard hole pattern
  50 Hz models: IEC standard hole pattern

OPTIONAL

- Space heater kit
- Bearing temperature detectors
- Optional voltages:
  60 Hz: 380V, 440V, 600V
  50 Hz: 380V, and 415V
- Oversized generators for Class F temperature rise
- UL Listing

SPECIFICATIONS

Type……..……Brushless, revolving field
solid-state automatic voltage regulator
Construction……..…..……Two bearings
three phase, series star connected
Enclosure……..Drip proof IP23, guarded

Over-speed capability
60 Hz…….……..….125% of synchronous speed
50 Hz……..……150% of synchronous speed
Waveform deviation, line to line, no load……Less than 3%
Paralleling capability……...Standard with adjustable
voltage droop
Voltage level adjustment……..……+/- 5.0%
Voltage regulator …….……..… 3-phase sensing with
variable Volts-Per-Hertz response
Voltage regulation, steady state……..……..+/- 0.5%
Voltage regulation with 3% speed change……..….+/- 0.5%
Voltage gain…….……....adjustable to compensate for
engine speed droop and line loss
TIF…….……Less than 50
Number of leads……..……..……..6

PRODUCT SUPPORT

- Standard Caterpillar warranty
- Optional extended Caterpillar warranty
- Serviceable parts available through Cat Parts System
- Service intervals agree with recommended engine practices

SERVICEABILITY

- Stator leads exit top
- Replaceable bearing sleeve(s) for longer life and lower repair cost
- Easy access to serviceable parts
- Improved wire and terminal identification ensuring reliable connection

CABLE ENTRY

- Top cable entry on LV package
- Bottom cable entry on MV packages

MAIN STATOR CONSTRUCTION

The 1800 frame generators use Round lamination stator design.

Stator coil pitch, coil distribution designed to produce optimum waveform and minimum total harmonic distortion. Stator slots are insulated by slot liners and coil separators. Slot liners, coil separators, and top sticks provide an adequate distance from the coil to ground.

The thickness of liners, separators, and phase sheets provides superior protection between phases and ground.

Low voltage stator windings are given a 3000 volt “high pot” test (150% of the NEMA and IEC requirements for 460 volt generators) before the insulation is applied. The stators are then given a vacuum impregnation treatment of polyester material, followed by an application of epoxy resin. This sealed stator is then given a final 2000 volt “high pot” test.

ROTOR CONSTRUCTION

The main rotor is constructed using a precision “wet” layer winding process with epoxy painted on the bare rotor and on each layer. This ensures bonding of all the wire layers together, bonding of the coils to the rotor laminations, and a sealed insulation system. The rotor is put in the oven for curing the epoxy.

The exciter rotor is machine wound and receives a trickle coat of a fungus-resisting resin. Numerically controlled turning and grinding machines produce rotor shafts with close repeatable tolerances. Grade-8 bolts are used wherever joints are subject to induced stresses. A complete coating of red sealer is applied to protect the rotors and shaft from corrosion.

Every production rotor is dynamically balanced in two planes to within 0.0508 mm deflection peak-to-peak amplitude and run at rated speed before assembly into the stator.

GENERATOR DATA *AUGUST 27, 2014*

Selected Model

Engine: C175-16	**Generator Frame:** 1868	**Genset Rating (kW):** 3000.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 4330082	**Genset Rating (kVA):** 3750.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 4510.5
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 40953 /40749 /41407 /9981

Spec Information

Generator Specification

Frame: 1868 **Type:** SR5	**No. of Bearings:** 2
Winding Type: FORM WOUND	**Flywheel:** 21.0
Connection: SERIES STAR	**Housing:** 00
Phases: 3	**No. of Leads:** 6
Poles: 4	**Wires per Lead:** 8
Sync Speed: 1800	**Generator Pitch:** 0.6667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	750.0	93.4
0.5	1500.0	95.8
0.75	2250.0	96.3
1.0	3000.0	96.3

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1270	0.0078
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1237	0.0076
TRANSIENT - SATURATED X'_d	0.1855	0.0114
SYNCHRONOUS - DIRECT AXIS X_d	2.8630	0.1759
SYNCHRONOUS - QUADRATURE AXIS X_q	1.2744	0.0783
NEGATIVE SEQUENCE X_2	0.1253	0.0077
ZERO SEQUENCE X_0	0.0081	0.0005

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	5.5950
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.3618
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0087
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0073
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.0080
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0068
EXCITER TIME CONSTANT T_e	0.2230
ARMATURE SHORT CIRCUIT T_a	0.0463

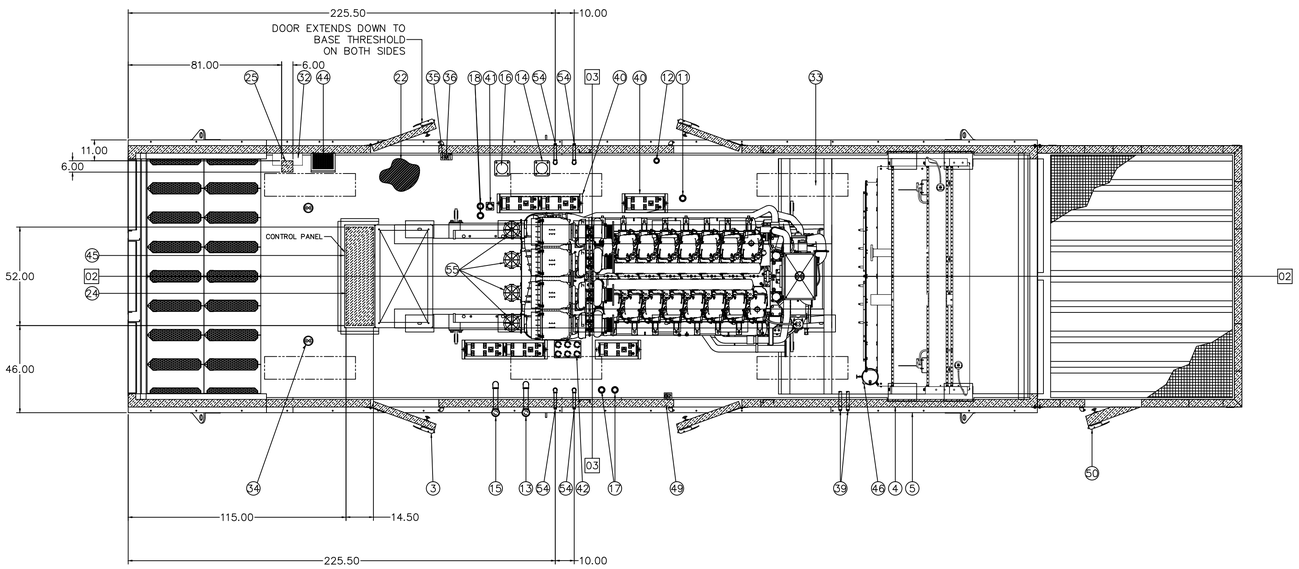
Short Circuit Ratio: 0.47	Stator Resistance = 8.0E-4 Ohms	Field Resistance = 1.106 Ohms

Voltage Regulation

Voltage level adustment: +/-	5.0%
Voltage regulation, steady state: +/-	0.5%
Voltage regulation with 3% speed change: +/-	0.5%
Waveform deviation line - line, no load: less than	3.0%
Telephone influence factor: less than	50

Generator Excitation

	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	13.4 Volts	56.09 Volts	Volts
Excitation current	1.23 Amps	4.24 Amps	Amps



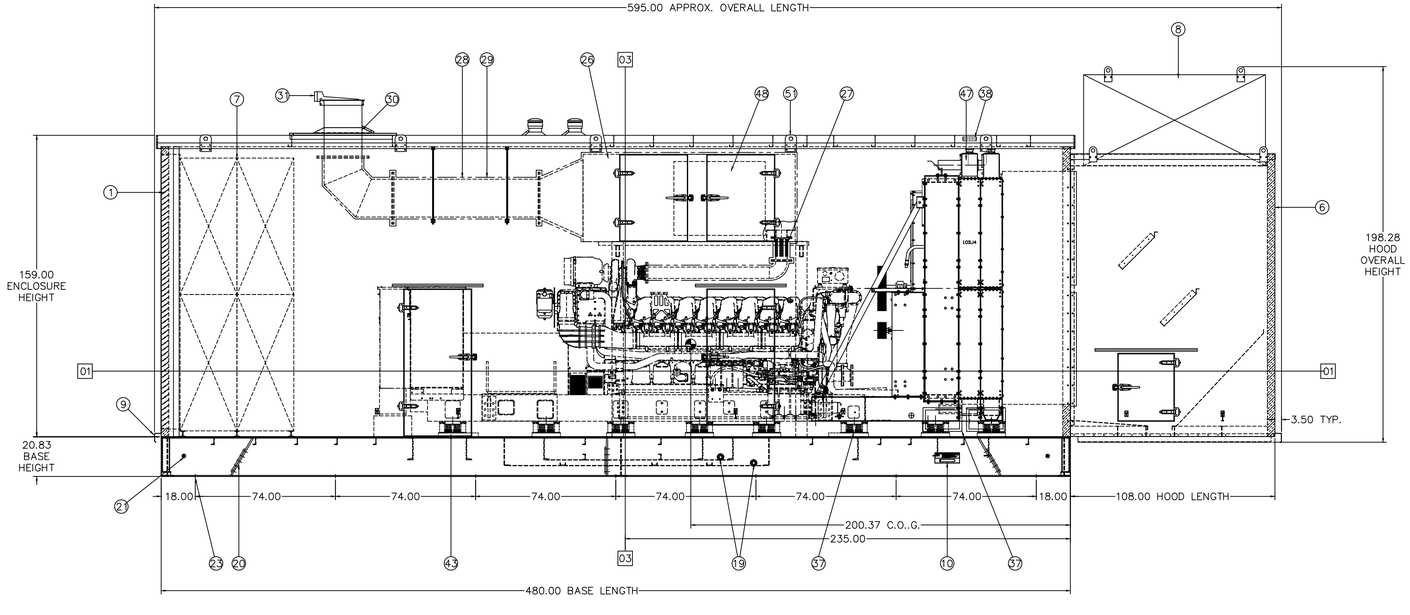
01 CENTERLINE OF CRANKSHAFT

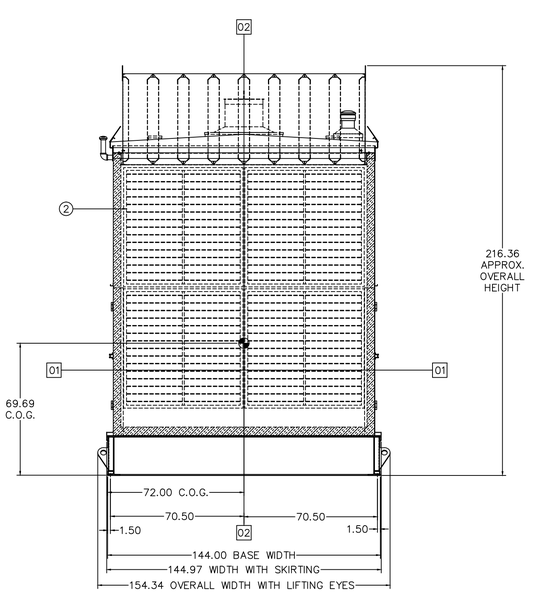
02 CENTERLINE OF ENGINE

03 REAR FACE OF BLOCK

1. STATIONARY INTAKE LOUVERS WITH SCREENS
2. GRAVITY DISCHARGE LOUVERS
3. (4) 36"W x 72" SINGLE ACCESS DOORS WITH CHROME SLAM LATCH DOOR HANDLES, S.S. HINGES, INTERIOR RELEASE, RUBBER GASKETING, J-DRIPS AND STAINLESS STEEL DOOR OPEN HOLDERS
4. 4" DEEP WALLS WITH (1) LAYER OF 2" SEMI-RIGID AND (1) LAYER OF 1½" SEMI RIGID INSULATION AND 22 GAUGE PERFORATED LINER IN ENCLOSURE
5. FLAT BAR WITH GASKETING FOR REMOVABLE ENCLOSURE
6. DISCHARGE HOOD WITH BAFFLE REMOVABLE FROM MAIN ENCLOSURE
7. 5' DEEP AIR INTAKE SOUND BAFFLES
8. 4' DEEP DISCHARGE HOOD BAFFLE WITH RODENT SCREEN
9. WEATHER SKIRTING AT ENCLOSURE/BASE SEAM
10. 600/660 GALLON U.L. 142 FUEL TANK AND RUPTURE BASIN BASE.
11. 4" MANUAL FILL WITH CAP
12. SITE GAUGE WITH KICK GAURD
13. 2" TANK VENT EXTENDED THE EXTERIOR AT THE ROOF LINE
14. 6" EMERGENCY TANK VENT EXTENDED TO THE EXTERIOR AT THE ROOF LINE
15. 2" RUPTURE BASIN VENT EXTENDED THE EXTERIOR AT THE ROOF LINE
16. 6" EMERGENCY RUPTURE BASIN VENT EXTENDED TO THE EXTERIOR AT THE ROOF LINE
17. (2) 2" NPT COUPLINGS IN TANK (SPARES)
18. (2) 2" NPT COUPLINGS IN RUPTURE BASIN (SPARES)
19. 2" NPT DRAIN PORTS IN TANK AND RUPTURE BASIN
20. 6-POINT REMOVABLE LIFTING EYES
21. GROUND BOSS (1 ON EXTERIOR OF BASE EACH END OPPOSITE CORNERS)
22. 7 GAUGE FLOOR PLATE
23. (7) 1.25" CUSTOMER MOUNT HOLES PER SIDE
24. STUB UP FOR LOAD CABLES AND CONTROL WIRING
25. STUB UP FOR A.C. PANEL
26. AIR CLARITY 3000 RF TIER IV EXHAUST SILENCER
27. EXHAUST FLEXES
28. INTERIOR EXHAUST EXTENSION
29. EXHAUST BLANKETS FOR ALL INTERIOR PIPING
30. ROOF SKIRT
31. RAIN CAP
32. A.C. DISTRIBUTION PANEL, 120/208V - 3 PHASE
33. (6) A.C. INTERIOR FLUORESCENT LIGHTS - 4' LONG - T8 TYPE
34. (2) D.C. INTERIOR INCANDESCENT LIGHTS WITH 0-60 MINUTE TIMER
35. (2) SWITCHES
36. (2) GFCI RECEPTACLES
37. ISOLATOR ADJUSTMENT ACCESS PANEL
38. RADIATOR ACCESS CAP
39. EXTENDED OIL AND WATER DRAINS WITH VALVES TO SIDE OF ENCLOSURE AND LABELED
40. (2) SETS OF (6) BATTERIES IN A STACKED RACK WITH CABLES (DEALER SUPPLIED BATTERIES)
41. RUPTURE BASIN ALARM SWITCH
42. (6) 2" NPT FUEL SWITCH FITTINGS
43. CAT SPRING ISOLATORS
44. (2) BATTERY CHARGERS, WALL MOUNTED (CAT # 131-0832-CHG 01)
45. FACTORY MOUNTED 5000 AMP MAIN BREAKER (REAR FACING)
46. 5 GALLON RADIATOR OVERFLOW TANK
47. IEA RADIATOR
48. (4) 36"W x 46"T SINGLE ACCESS DOORS WITH CHROME SLAM LATCH DOOR HANDLES, S.S. HINGES, RUBBER GASKETING, AND J-DRIPS
49. REMOVABLE MIDDLE DOOR POST
50. 30"W x 30" SINGLE ACCESS HOOD DOOR WITH CHROME SLAM LATCH DOOR HANDLE, S.S. HINGES, INTERIOR RELEASE, RUBBER GASKETING, J-DRIP AND STAINLESS STEEL DOOR OPEN HOLDER
51. LIFTING EYES FOR ENCLOSURE LIFTING ONLY
53. REMOVED
54. 1" NPT THROUGH ENCLOSURE WALL AND PLUMBED TO FUEL TANK FOR REMOTE FUEL SUPPLY AND RETURN. (FITTINGS ARE LOCATED ON BOTH SIDES OF THE ENCLOSURE/BASE). REQUIRES DROP TUBES
55. RACOR CCV CRANKCASE VENTILATION SYSTEM

NOTES:
1. 14 GAUGE SHEET METAL BOLT TOGETHER ENCLOSURE CONSTRUCTION
2. 78 DBA @ 23' - FREE FIELD - GROUND LEVEL - SINGLE UNIT OPERATION
3. RACOR CCV'S RETURN OUTLET PLUMBED TO AIR BREATHER
4. CENTER OF GRAVITY INCLUDING FUEL
5. DO NOT USE THIS DRAWING FOR SHIPPING WEIGHTS AND SHIPPING DIMENSIONAL INFORMATION - CONSULT ISCO FACTORY SHIPPING DEPARTMENT FOR SHIPPING WEIGHTS AND DIMENSIONS
6. PAINT COLOR ANSI 70





ESTIMATED DRY WEIGHT	103,755 LBS
ESTIMATED WET WEIGHT	108,693 LBS
OVERALL LENGTH	595"
OVERALL WIDTH	155"
OVERALL HEIGHT	199"

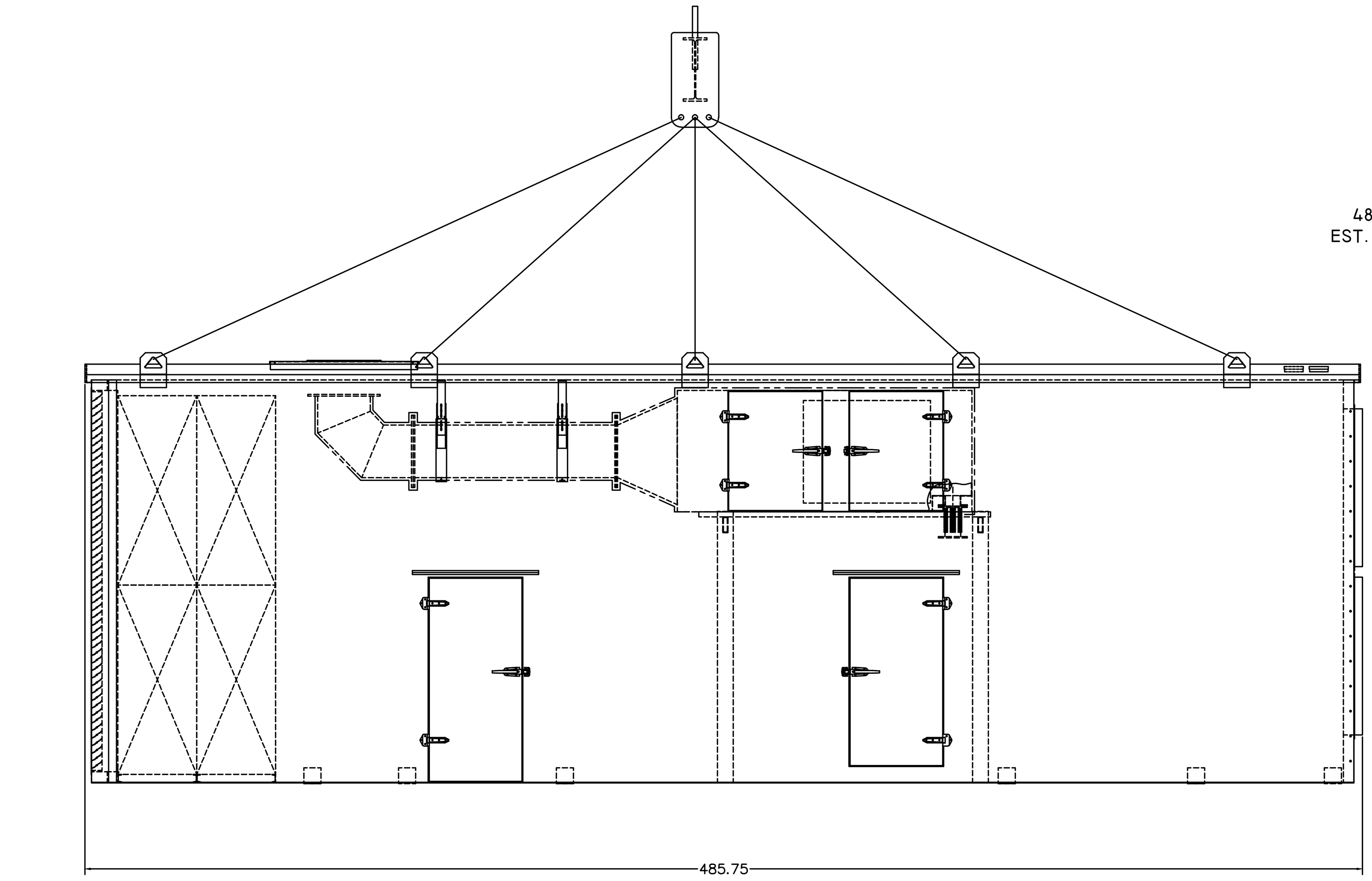
NOTES:
1. ALL OVERALL DIMENSIONS ARE NOMINAL WITH A 1" TOLERANCE
2. ALL ENGINE MOUNTING HOLES ARE ± .06" FROM CENTER TO CENTER AND ± .03" TOLERANCE
3. ALL DIMENSIONED FLANGES ARE ± .06" TOLERANCE
4. ALL DIMENSIONED PIPING ARE ± .06" TOLERANCE
5. ALL DIMENSIONED WELDED STRUCTURES ARE ± .03" TOLERANCE
6. ALL DIMENSIONED FORMED STRUCTURES ARE ± .03" TOLERANCE
7. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
8. ALL WEIGHTS ARE IN POUNDS UNLESS OTHERWISE NOTED
9. ADD 2" PER DOOR FOR SWING CLEARANCE
10. DRY WEIGHTS INCLUDE ONLY CAT SUPPLIED ITEMS ONLY
11. DRY WEIGHTS INCLUDE ENGINE OIL AND WATER
12. WET WEIGHTS ARE USED FOR PACKAGES WITH FUEL TANKS

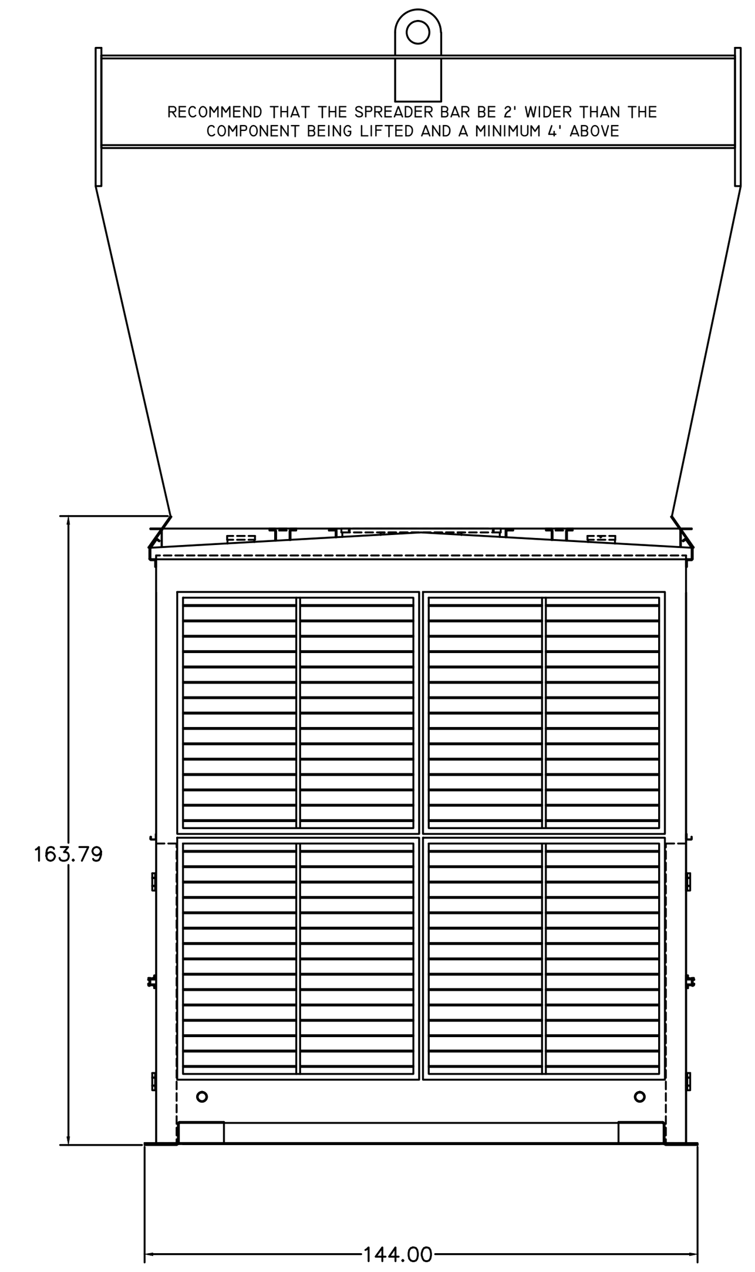
DRAWING NUMBER: W0981

REV.#	DATE:	DESCRIPTION:	DRN BY:

WORK ORDER NUMBER: 9817	PURCHASE ORDER NUMBER:	INTERNATIONAL SUPPLY CO., INC.	
JOB REFERENCE: EQUINIX SV5-3 UNIT #7		2717 W. NORTH STREET, P.O. BOX 17, EDELSTEIN, IL 61526 - www.elbisco.com	
		DRAWING APPROVAL: INITIAL/DATE	DRAWING APPROVAL: INITIAL/DATE
DRAWN BY: DAJ	ENGINE SIZE: C175	FUEL TANK CAPACITY: 600 GALLONS	DRAWING TITLE: MECHANICAL LAYOUT
DATE: 08/18/2014	KW AND VOLTAGE: 3000kW @ 480V	RUPTURE BASIN CAPACITY: 660 GALLONS	DRAWING DESCRIPTION: (1) C175, 3000kW @ 480V, WITH A IEA RADIATOR, SOUND ATTENUATED ENCLOSURE, WITH A U.L. 142 600 GAL. / 660 GAL. FUEL TANK / RUPTURE BASIN BASE, WITH A INTERIOR SILENCER.
SCALE: 1=40	RADIATOR DESIGNATION: IEA RADIATORS	SOUND ATTENUATION: 78dBA @ 23 FEET	
REV.# 0	CUSTOMER: PETERSON POWER SYSTEMS	ENCLOSURE MATERIAL: 14 GAUGE	

ENCLOSURE
486"L x 144"W x 164"H
EST. WEIGHT = 27,506 LBS.



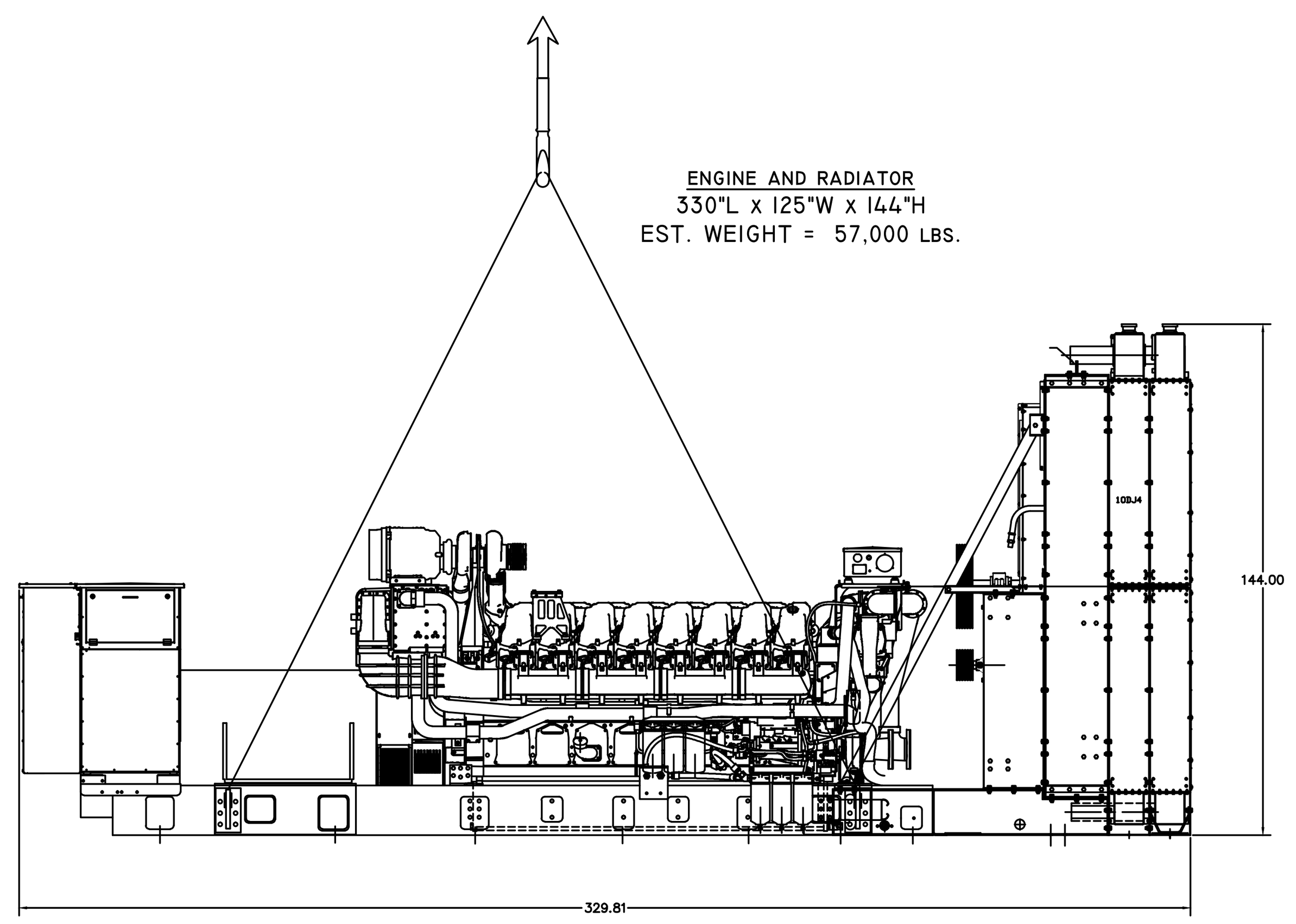


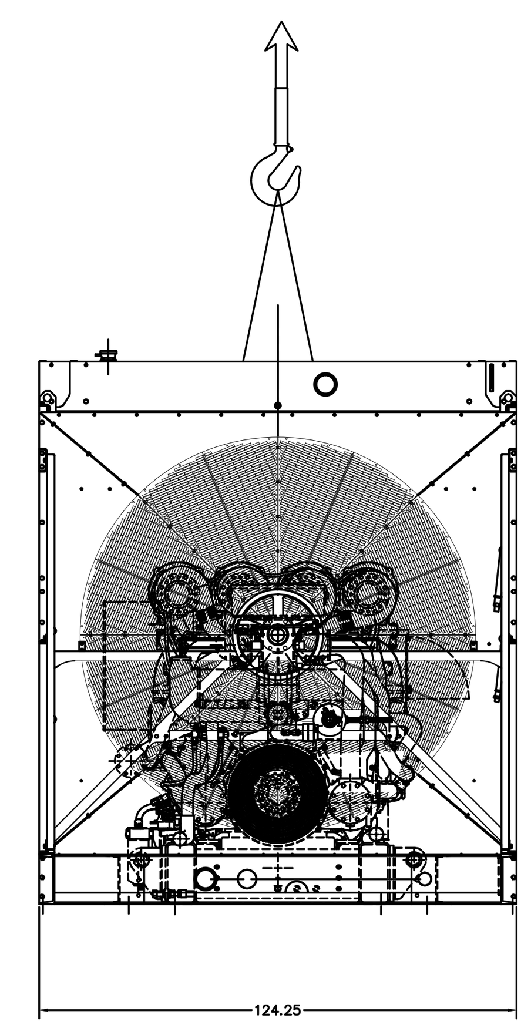
DO NOT USE THIS DRAWING FOR SHIPPING WEIGHTS AND SHIPPING DIMENSIONAL INFORMATION - CONSULT ISCO FACTORY SHIPPING DEPARTMENT FOR SHIPPING WEIGHTS AND DIMENSIONS

ISCO NOT RESPONSIBLE FOR RIGGING !!!

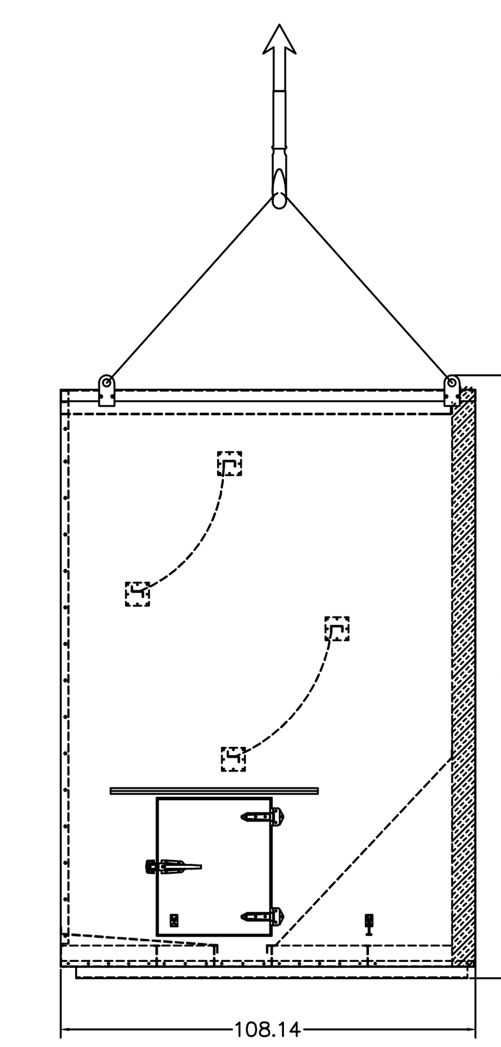
THESE ILLUSTRATIONS ARE FOR REFERENCE ONLY. ALL RIGGING EQUIPMENT (SPREADER BAR, CABLES, SUPPORT BEAMS, ETC.) & POINTS OF CONNECTION ARE THE RESPONSIBILITY OF THE RIGGER.

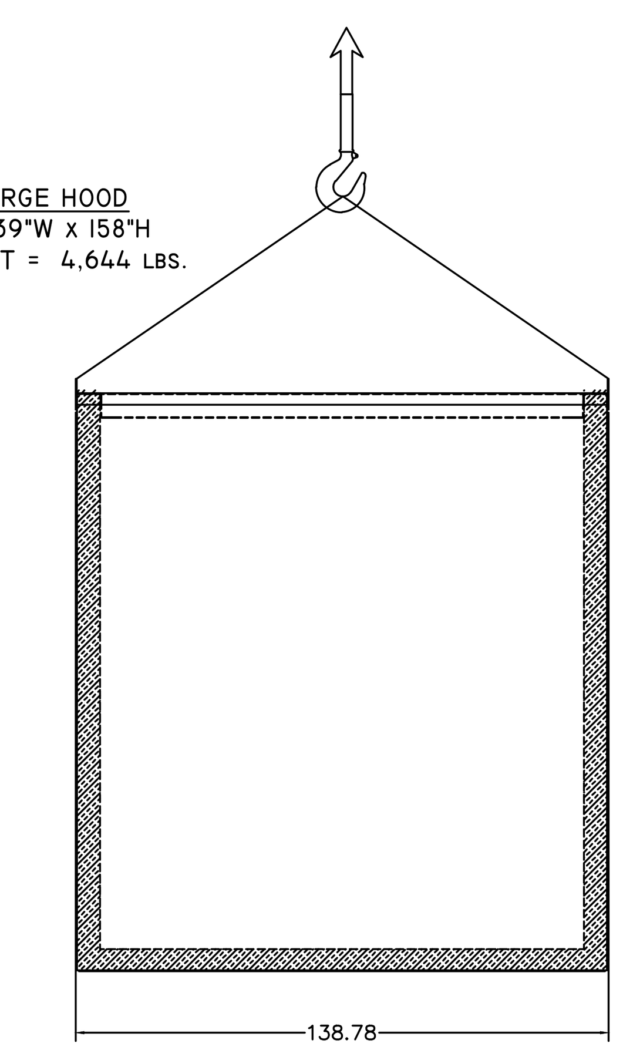
ENGINE AND RADIATOR
330"L x 125"W x 144"H
EST. WEIGHT = 57,000 LBS.

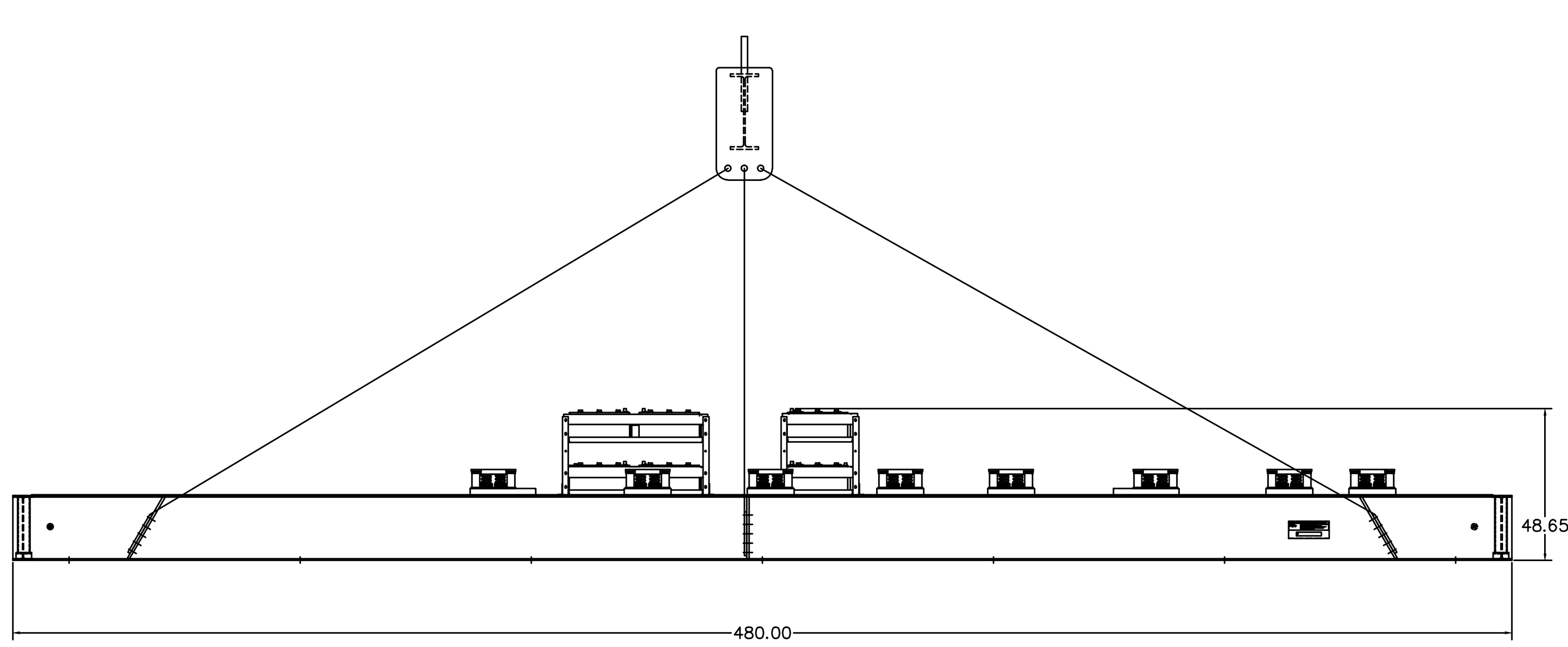




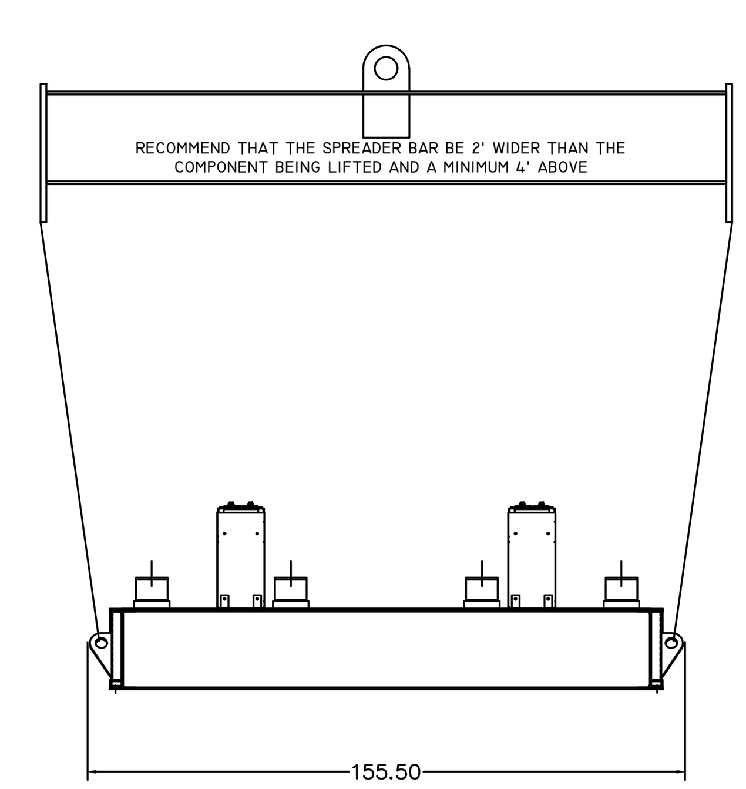
DISCHARGE HOOD
109"L x 139"W x 158"H
EST. WEIGHT = 4,644 LBS.



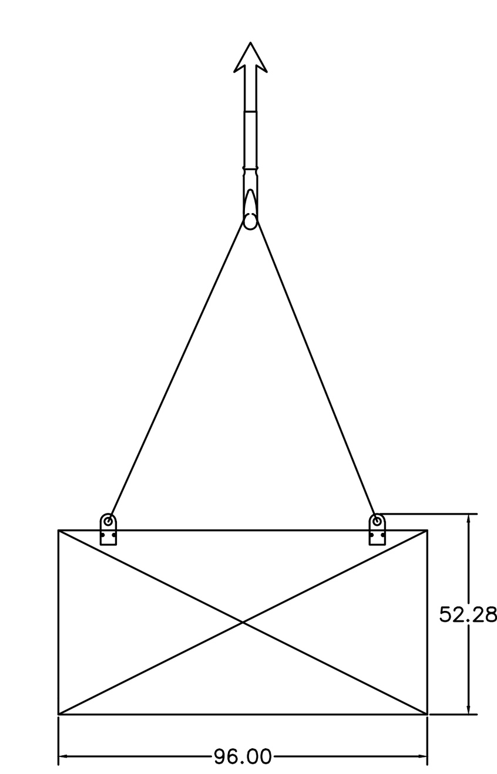


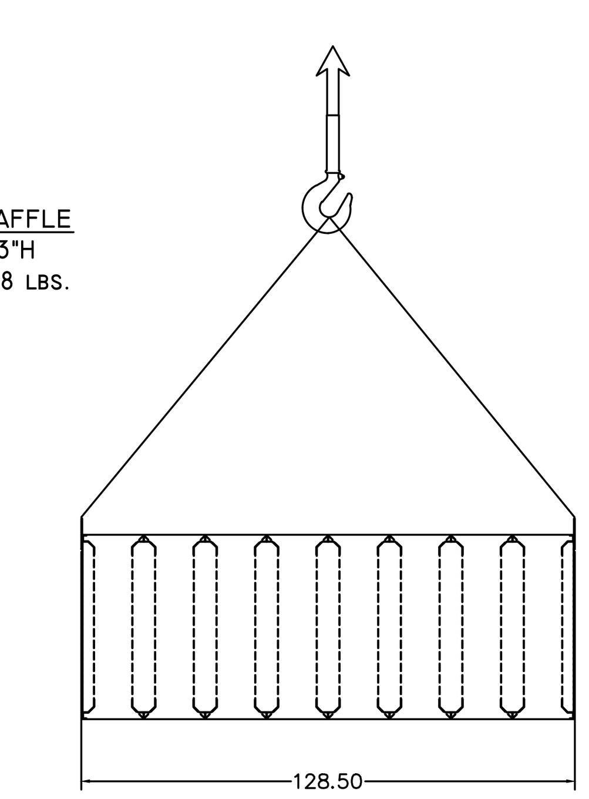


BASE
480"L x 156"W x 49"H
EST. DRY WEIGHT = 12,508 LBS.
EST. WET WEIGHT = 17,008 LBS.



DISCHARGE HOOD BAFFLE
96"L x 129"W x 53"H
EST. WEIGHT = 1,618 LBS.





INTERNATIONAL SUPPLY CO., INC.
2717 W. NORTH STREET, P.O. BOX 17, EDELSTEIN, IL 61526 - WWW.ELHISCO.COM

WORK ORDER NUMBER:	9817
JOB REFERENCE:	EQUINIX SV5-3 UNIT #7
DRAWN BY:	DAJ
DATE:	08/18/14
SCALE:	1:50
REV #:	0
ENGINE SIZE:	C175
KW AND VOLTAGE:	3000KW @ 480V
RADIATOR DESIGNATION:	IEA
CUSTOMER:	PETERSON POWER SYSTEMS
FUEL TANK CAPACITY:	600 GALLONS
RUPTURE BASIN CAPACITY:	660 GALLONS
SOUND ATTENUATION:	78dBA @ 23 FEET
ENCLOSURE MATERIAL:	14 GAUGE
DRAWING TITLE:	RIGGING DIAGRAM
DRAWING DESCRIPTION:	RIGGING DIAGRAM FOR (1) C175, 3000KW @ 480V, WITH A IEA RADIATOR, SOUND ATTENUATED ENCLOSURE, WITH A INTERIOR SILENCER.
DRAWING NUMBER:	M9817-RIGGING

10/16/14 B4676

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CALIFORNIA 94109
(415) 771-6000

PERMIT TO OPERATE

Plant# 14676 Page: 1 Expires: NOV 1, 2016

This document does not permit the holder to violate any District regulation or other law.

Equinix LLC
11 Great Oaks Blvd
San Jose, CA 95119

Location: 11 Great Oaks Blvd
San Jose, CA 95119

S#	DESCRIPTION	[Schedule]	PAID
1	Standby Diesel engine, 1000 hp, Caterpillar, 1649 cu in Diesel Engine, Caterpillar model 3412, emergency	[B,731 days]	483
2	Standby Diesel engine, 1000 hp, Caterpillar, 1649 cu in Diesel Engine, Caterpillar model 3412, emergency	[B,731 days]	483
3	Standby Diesel engine, 1000 hp, Caterpillar, 1649 cu in Diesel Engine, Caterpillar model 3412, emergency	[B,731 days]	483
4	Standby Diesel engine, 2700 hp, Caterpillar, 4210 cu in Diesel Engine, Caterpillar model 3516B	[B,731 days]	1242
5	Standby Diesel engine, 2700 hp, Caterpillar, 4210 cu in Diesel Engine, Caterpillar model 3516B	[B,731 days]	1242
6	Standby Diesel engine, 2700 hp, Caterpillar, 4210 cu in Diesel Engine, Caterpillar model 3516B	[B,731 days]	1242
7	Standby Diesel engine, 2700 hp, Caterpillar, 4210 cu in Diesel Engine, Caterpillar model 3516B	[B,731 days]	1242
8	Standby Diesel engine, 4423 hp, EPA# 9CPXL106.T2E, Caterpillar Emergency Standby Diesel Generator Set (S#1 @ Emissions at: P8 Stack	[B,731 days]	2039

The operating parameters described above are based on information supplied by permit holder and may differ from the limits set forth in the attached conditions of the Permit to Operate. The limits of operation in the permit conditions are not to be exceeded. Exceeding these limits is considered a violation of District regulations subject to enforcement action.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CALIFORNIA 94109
(415) 771-6000

PERMIT TO OPERATE

Plant# 14676 Page: 2 Expires: NOV 1, 2016

This document does not permit the holder to violate any District regulation or other law.

S#	DESCRIPTION	[Schedule]	PAID
9	Standby Diesel engine, 4423 hp, EPA# 9CPXL106.T2E, Caterpillar Emergency Standby Diesel Generator Set (S#2 @ Emissions at: P9 Stack	[B,731 days]	2039
10	Standby Diesel engine, 4423 hp, EPA# 9CPXL106.T2E, Caterpillar Emergency Standby Diesel Generator Set (S#3 @ Emissions at: P10 Stack	[B,731 days]	2039
11	Standby Diesel engine, 4423 hp, EPA# 9CPXL106.T2E, Caterpillar Emergency Standby Diesel Generator Set (S#4 @ Emissions at: P11 Stack	[B,731 days]	2039
12	Standby Diesel engine, 4423 hp, EPA# 9CPXL106.T2E, Caterpillar Emergency Standby Diesel Generator Set (S#5 @ Emissions at: P12 Stack	[B,797 days]	3037
13	Standby Diesel engine, 4423 hp, EPA# 9CPXL106.T2E, Caterpillar Emergency Standby Diesel Generator Set (S#6 @ Emissions at: P13 Stack	[B,797 days]	3037

13 Permitted Sources

*** See attached Permit Conditions ***

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CALIFORNIA 94109
(415) 771-6000

PERMIT TO OPERATE

Plant# 14676 Page: 3 Expires: NOV 1, 2016

This document does not permit the holder to violate any District regulation or other law.

*** PERMIT CONDITIONS ***

Source# 1	subject	to	Condition	ID# 22820
Source# 2	"	"	"	ID# 22820
Source# 3	"	"	"	ID# 22820
Source# 4	"	"	"	ID# 22820
Source# 5	"	"	"	ID# 22820
Source# 6	"	"	"	ID# 22820
Source# 7	"	"	"	ID# 22820
Source# 8	subject	to	Condition	ID# 22850
Source# 9	"	"	"	ID# 22850
Source# 10	"	"	"	ID# 22850
Source# 11	"	"	"	ID# 22850
Source# 12	"	"	"	ID# 22850
Source# 13	"	"	"	ID# 22850

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*** PERMIT CONDITIONS ***

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COND# 22820 *applies to S#'s 1, 2, 3, 4, 5, 6, 7*

1. The owner/operator shall not exceed 20 hours per year per engine for reliability-related testing. Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited. [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. [Basis: Title 17, California Code ofRegulations, section 93115, ATCM for Stationary CI Engines]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
   a. Hours of operation for reliability-related activities (maintenance and testing).
   b. Hours of operation for emission testing to show compliance with emission limits.
   c. Hours of operation (emergency).
   d. For each emergency, the nature of the emergency condition.
   e. Fuel usage for each engine(s).

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[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

5. At School and Near-School Operation:
If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:

The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:
   a. Whenever there is a school sponsored activity (ifthe engine is located on school grounds)
   b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

"School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.

[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

COND# 22850 *applies to S#'s 8, 9, 10, 11, 12, 13*

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or

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for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
   a. Hours of operation for reliability-related activities (maintenance and testing).
   b. Hours of operation for emission testing to show compliance with emission limits.
   c. Hours of operation (emergency).
   d. For each emergency, the nature of the emergency condition.
   e. Fuel usage for each engine(s).
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

5. At School and Near-School Operation:
If the emergency standby engine is located on school grounds or within 500 feet of any school

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This document does not permit the holder to violate any District regulation or other law.

*** PERMIT CONDITIONS ***

grounds, the following requirements shall apply:

The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

"School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, athletic field, or other areas of school property but does not include unimproved school property.
[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

END OF CONDITIONS

S#	Source Description	Annual Average lbs/day PART	ORG	NOx	SO2	CO
1	Diesel Engine, Caterpillar model 3412, eme	.04	.1	.66	-	.81
2	Diesel Engine, Caterpillar model 3412, eme	.03	.08	.59	-	.72
3	Diesel Engine, Caterpillar model 3412, eme	.03	.07	.51	-	.63
4	Diesel Engine, Caterpillar model 3516B, em	.03	.09	.59	-	.72
5	Diesel Engine, Caterpillar model 3516B, em	.04	.1	.66	-	.81
6	Diesel Engine, Caterpillar model 3516B, em	.03	.07	.51	-	.63
7	Diesel Engine, Caterpillar model 3516B, em	.03	.06	.44	-	.54
8	Emergency Standby Diesel Generator Set (S#	-	.02	.34	-	.11
9	Emergency Standby Diesel Generator Set (S#	-	.02	.34	-	.11
10	Emergency Standby Diesel Generator Set (S#	-	.01	.23	-	.07
11	Emergency Standby Diesel Generator Set (S#	.02	.03	.58	-	.19
12	Emergency Standby Diesel Generator Set (S#	.01	.02	.42	-	.14
13	Emergency Standby Diesel Generator Set (S#	.02	.03	.65	-	.21
	T O T A L S	.3	.71	6.53		5.7

** PLANT TOTALS FOR EACH EMITTED TOXIC POLLUTANT **

Pollutant Name	Emissions lbs/day
Benzene	.02
Diesel Engine Exhaust Particulate Matter	.30