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San José City Data Center
(19-SPPE-04)

Data Response Set 6

Submitted to
California Energy Commission

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with technical assistance from

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Contents

Introduction

On September 14, 2021, California Energy Commission ("Commission") staff filed Data Request Set 6 for the San Jose Data Center Project, seeking additional information related to the applicant's revised project description and changes to the technical sections of the applicant's small power plant exception ("SPPE") application related to the project's change of backup generation technology to renewable natural gas. (See TN 239692.) Commission staff subsequently filed a revised Data Request Set 6 on September 15, 2021, which added one data request and superseded the previous Data Request Set 6 request. (*See* TN 239719.)

Provided below are Commission staff's Background descriptions and Data Requests, followed by the applicant's Responses.

Air Quality Data Requests

Background: Ambient Air Quality Impact Analysis for Construction

The applicant's Supplemental Filing (Supplemental Filing) revised the construction-phase emissions estimates (Appendix 3.3A of the SPPE Application; TN# 239413,8/20/2021) and provided an analysis of potential health risks caused by toxic air contaminants during construction (Table 3.3-20, p. 3.3-39; TN# 239409, 8/20/2021). For toxics, the applicant decided to model 437 individual construction-phase point sources (Table 3.3-12 and Appendix 3.3D, Table 1), but the analysis does not explain why this number of point sources was selected, where they emit on or near the site, or why area or volume sources would not be more representative of construction. The Supplemental Filing concluded the discussion of construction-phase impacts without quantifying criteria pollutant ambient air quality impacts. The analysis should show the concentrations of criteria air pollutants resulting during construction.

Data Requests

64) Please provide an ambient air quality impact analysis that confirms whether the construction-phase criteria pollutant emissions would comply with the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS).

Response: Construction-phase criteria pollutant emissions were compared to the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) significance criteria identified in Table 2-4 of the BAAQMD's 2017 CEQA Air Quality Guidelines[1]. The estimated emissions of criteria pollutants presented in Table 3.3-14 of the Supplemental Filing[2] were below the thresholds identified by BAAQMD and are, therefore, considered to have a less-than-significant impact. As a result, dispersion modeling of criteria air pollutants to demonstrate compliance with the ambient air quality standards is not warranted. This conclusion is further supported because the estimated emissions are temporary in nature and will be mitigated using best management practices identified by the BAAQMD.

Notwithstanding that this analysis is not required by any other lead agency pursuant to CEQA nor the BAAQMD for permitting, in the interests of time and with the understanding that Staff will diligently continue preparation of the DEIR quickly, the analysis will be submitted under separate cover on or before November 5, 2021.

65) Please support the analysis of construction-phase criteria pollutant impacts by describing how the construction sources are represented in the dispersion model and how concentrations of criteria air pollutants during different averaging times are derived. This information should demonstrate how daytime-only construction activities are represented in the consideration of 1-hour and daily impacts.

[1] https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en
[2] TN# 239409, 8/20/2021

Response: Consistent with the response to Data Request #64, construction-phase criteria pollutant emissions should not be required by the CEC for a CEQA level analysis and therefore were not evaluated using a dispersion model since the mass emissions from temporary construction activities were estimated to be below the BAAQMD significance criteria identified in Table 2-4 of the BAAQMD's 2017 CEQA Air Quality Guidelines.

The Project's construction-phase health risk dispersion model setup is described in Section 3.3.5.2 of the Applicant's Supplemental Filing[3]. Diesel Particulate Matter (DPM) was the only toxic modeled for the construction-phase health risk assessment (HRA) since diesel exhaust was identified as the only toxic being emitted from construction equipment at the site. Below is an excerpt of the source characterization for the HRA dispersion modeling of construction equipment, including daytime restrictions:

> ***Source Parameters.*** *The exhaust emissions resulting from construction equipment and vehicles were modeled as a set of point sources spaced approximately 25 m apart over the onsite demolition, excavation, and construction area with a horizontal stack release. The horizontal release type is an AERMOD beta option (that is, nonregulatory default option), which negates mechanical plume rise. This conservative approach was used because it is unknown whether all construction equipment will have vertically oriented exhaust stacks. Stack release parameters consisted of a stack release temperature of 533 degrees Kelvin (K; 500 degrees Fahrenheit), a stack diameter of 0.127 m (5 inches), and a release height of 4.6 m (15 feet) based on data for typical construction equipment. Modeling was also restricted to the hours of 7 a.m. to 7 p.m., which was assumed to coincide with the expected daily construction schedule allowed by local noise ordinances.*

Notwithstanding that this analysis is not required by any other lead agency pursuant to CEQA nor the BAAQMD for permitting, in the interests of time and with the understanding that Staff will diligently continue preparation of the DEIR quickly, the analysis will be submitted under separate cover on or before November 5, 2021. The submittal would include a description how sources are represented in the dispersion model and how concentrations of predicted criteria pollutants during different averaging times are compared to the applicable ambient air quality standards,

Background: Compliance with Reach Code Ordinance

In the Supplemental Filing, the applicant's discussion of the City of San Jose Natural Gas Infrastructure Prohibition and Reach Code Ordinances indicates that the "natural gas-fired generators will meet the distributed generation criteria pollutant emission standards of 17 CCR 94203," as stated in the Greenhouse Gas Emissions analysis (Section 3.8 of the SPPE Application). However, the criteria air pollutant emissions rates submitted in the Air Quality analysis (e.g., Table 3.3-11) are higher than those that would be allowed under the Air Resources Board's Distributed Generation Certification Program. The Air Quality section says the natural gas-fired engines "do not qualify as distributed generation resources under 17 CCR 94201" (p.3.3-8). Staff needs clarification on whether the project's natural gas-fired generators would be guaranteed not to exceed the emissions limits in the Distributed Generation Certification program.

Data Request

66) Please confirm whether the project's 224 natural gas-fired generators would be guaranteed by the manufacturer to achieve the emissions standards in the Air Resources Board's Distributed Generation Certification program and provide a copy of the manufacturer guarantee with this demonstration.

Response: See Appendix 3.3B, page 5 of Transaction Number 239419 for documentation that natural gas generator vendor, Enchanted Rock, has guaranteed the engines comply with the emissions standards in the Air Resources Board's Distributed Generation Certification program. **Attachment DR-66** presents a copy of this document.

[3] TN# 239409, 8/20/2021.

Background: Cumulative Health Risk Assessment

The Bay Area Air Quality Management District (BAAQMD) California EnvironmentalQuality Act (CEQA) Guidelines for assessing cumulative health risk impacts recommend investigating all sources of toxic air contaminants (TACs) within 1,000 feet of a proposed project. The Supplemental Filing only analyzed the health risk impacts related to the project itself. Staff needs the cumulative health risks evaluation to complete the Environmental Impact Report.

Data Requests

67) Please contact the BAAQMD for information on the potential cumulative TAC health risks for all sources of TACs including railroad, highway, and stationary sources within 1,000 feet of the proposed project boundary.

Response: The BAAQMD CEQA Air Quality Guidelines and available on-line tools[4] were used to determine the appropriate sources for inclusion in the cumulative HRA. Sources identified within 1,000 feet of the proposed Project are the Los Esteros Critical Energy Facility (stationary source) and State Route 237, just west of the Interstate 880 interchange (highway). The BAAQMD was contacted to obtain source information for the State Route 237 roadway segment. See the below response to Data Request #68 for details of the cumulative assessment.

68) Please analyze the project's contribution to cumulative health risk impacts in conjunction with the impacts of the nearby sources reported by BAAQMD.

Response: The BAAQMD CEQA Air Quality Guidelines recommend that toxic air contaminant (TAC) and particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) sources within 1,000 feet of the proposed facility be included in the cumulative HRA. Consistent with Table 2-1 of the BAAQMD CEQA Air Quality Guidelines, the results of the analysis will then be compared to a cumulative cancer risk threshold of 100 in one million, chronic hazard index (HI) of 10, and an annual $PM_{2.5}$ concentration of 0.8 micrograms per cubic meter ($\mu g/m^3$; not including background concentrations). As noted in the above response to Data Request #67, the BAAQMD CEQA Air Quality Guidelines and on-line CEQA tools identified the Los Esteros Critical Energy Facility (stationary source) and State Route 237, just west of the Interstate 880 interchange (highway), as the only existing sources within 1,000 feet of the proposed Project. Therefore, the potential impacts to cancer risk, chronic HI, and annual $PM_{2.5}$ concentrations from these sources, together with the proposed Project, were evaluated and compared to the applicable cumulative thresholds of significance.

The potential increase in cancer risk, chronic HI, and annual $PM_{2.5}$ concentrations from operation of the proposed Project were obtained from Appendix 3.3E, Table 2 and Table 3.3-18 of the Applicant's Supplemental Filing[5], respectively. The HRA results for the point of maximum impact (PMI), maximum exposed individual resident (MEIR), and maximum exposed individual worker (MEIW) are summarized in Table DR68-1 below. For annual $PM_{2.5}$ concentrations, the maximum offsite concentration is summarized in Table DR68-2 below and described as the PMI location. The increase in predicted annual $PM_{2.5}$ concentrations at the MEIR and MEIW are assumed to be less than at the PMI location.

Potential impacts to health risk and annual $PM_{2.5}$ concentrations resulting from the Los Esteros Critical Energy Facility, located directly west of the proposed Project, were obtained from the California Energy Commission (CEC) Final Staff Assessment for the Los Esteros Critical Energy Facility II Phase 2 Project (May 2005)[6]. The PMI for cancer risk, chronic HI, and annual $PM_{2.5}$ concentrations from the Los Esteros Critical Energy Facility were identified in Public Health Table 3 and Air Quality Table 19, respectively, and are summarized in Tables DR68-1 and DR68-2, as appropriate. These PMI health risks and annual $PM_{2.5}$

[4] https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools
[5] TN 239419, 8/20/2021 and TN 239409, 8/20/2021.
[6] CEC-700-2005-008.

concentrations were conservatively assumed to overlap with the location of PMI, MEIR, and MEIW predicted impacts from the proposed Project.

Potential impacts to health risk and annual $PM_{2.5}$ concentrations resulting from the segment of State Route 237 within 1,000 feet south of the proposed Project were obtained from the BAAQMD. The BAAQMD has generated raster files for cancer risk and DPM for all highways and freeways with greater than 30,000 annual average daily traffic (AADT). As further explained in the correspondence included in **Attachment DR-68**, the raster files incorporate EMFAC 2014 data for fleet mix and includes the Office of Environmental Health Hazard Assessment's (OEHHA) most recent 2015 guidance to calculate health risk. The raster files present an identified cancer risk and DPM concentration for 20x20-meter grid cells throughout the Bay Area. Raster data results for the grid cell closest to the proposed Project's PMI, MEIR, and MEIW locations were used to determine the State Route 237 traffic impacts at those locations. Since the raster files only contain cancer risk and DPM concentrations, the chronic HI was calculated by dividing the DPM concentration at those locations by the OEHHA reference exposure level for DPM of 5 $\mu g/m^3$; the annual $PM_{2.5}$ concentrations were assumed to be directly represented by DPM concentrations. Table DR68-1 summarizes the cumulative health risk impacts and Table DR68-2 summarizes the cumulative $PM_{2.5}$ concentrations from the major roadway for these locations.

Table DR68-1. Predicted Cumulative Health Risk Impacts[a]

Facility/Source	Cancer Risk[b] (PMI)	Cancer Risk[b] (MEIR)	Cancer Risk[b] (MEIW)	Chronic HI[c] (PMI)	Chronic HI[c] (MEIR)	Chronic HI[c] (MEIW)
SJ02	3.38	0.30	0.27	0.0010	0.0001	0.0010
Los Esteros	0.18	0.18	0.18	0.0070	0.0070	0.0070
State Route 237	12.57	14.46	13.57	0.0500	0.0586	0.0500
Total	**16.13**	**14.94**	**14.02**	**0.0580**	**0.0657**	**0.0580**
Threshold	100	100	100	10	10	10
Above Threshold?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

[a] The coordinates for each receptor location are as follows, provided in Universal Transverse Mercator (UTM) Zone 10:

PMI location: 594,538.7 easting, 4,142,956.3 northing
MEIR location: 594,900.0 easting, 4,141,800 northing
MEIW location: 594,538.7 easting, 4,142,956.3 northing

[b] Cancer risk units: in one million
[c] Chronic HI units: unitless

Table DR68-2. Predicted Cumulative Annual $PM_{2.5}$ Impacts[a, b]

Facility/Source	PMI	MEIR	MEIW
SJ02	0.06	0.06	0.06
Los Esteros	0.1	0.1	0.1
State Route 237	0.25	0.29	0.25
Total	**0.41**	**0.45**	**0.41**
Threshold	0.8	0.8	0.8
Above Threshold?	**NO**	**NO**	**NO**

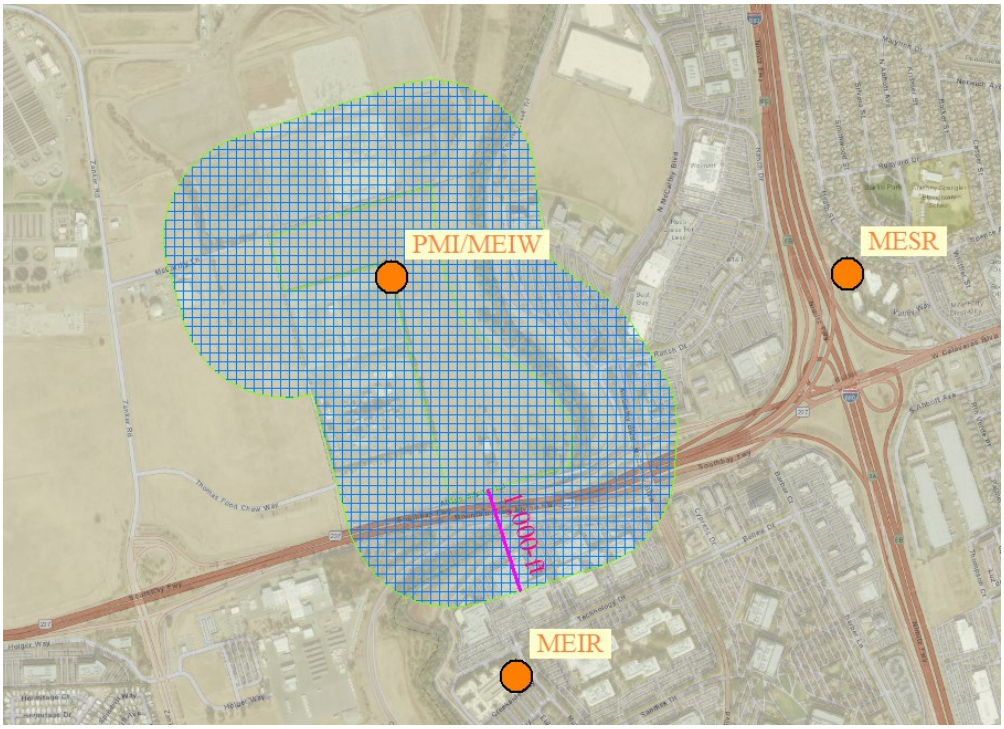
[a] $PM_{2.5}$ units: $\mu g/m^3$
[b] The coordinates for each receptor location are as follows, provided in UTM Zone 10:

PMI location: 594,538.7 easting, 4,142,956.3 northing
MEIR location: 594,900.0 easting, 4,141,800 northing
MEIW location: 594,538.7 easting, 4,142,956.3 northing

As seen in Table DR68-1 and Table DR68-2, the results of the cumulative HRA for cancer risk, chronic HI, and annual $PM_{2.5}$ concentrations are below the respective significance criteria at the proposed Project's PMI, MEIR, and MEIW locations.

Cumulative impacts at the maximum exposed sensitive receptor (MESR) are assumed to be less than those presented for the PMI, MEIR, and MEIW based on the MESR being located farther from the sources analyzed in the cumulative HRA. Although the MESR is located near the Interstate 880 interchange, that roadway segment is outside of the 1,000-foot radius used to identify sources for inclusion in the cumulative HRA. Because the raster files obtained from the BAAQMD show overlapping impacts from all major roadway segments within the Bay Area and do not differentiate contributions from individual roadway segments, the individual contribution of the segment of State Route 237 included in the cumulative HRA to the MESR impact cannot be easily identified. Therefore, the MESR location from the Applicant's Supplemental Filing[7] is assumed to have a less-than-significant cumulative impact from the proposed Project, Los Esteros Critical Energy Facility, and the segment of State Route 237 within the 1,000-foot buffer. Figure DR68-1 shows the PMI, MEIR, MEIW, and MESR locations and supports justification of the MESR impacts being less than significant based on its relative distance from the sources within the 1,000-foot buffer of the site.

Figure DR68-1. Receptor Locations



69) Please provide a cumulative TAC health risks analysis to include all sources of TACs within 1,000 feet of the proposed project.

Response: See the above response to Data Request #68.

[7] TN 239409, 8/20/2021.

Energy And Energy Resources Data Requests

Background

In the original SPPE application, the project's PUE was projected to be 1.25. In the revised project where diesel backup generators would be replaced with natural gas generators, the project's annual average PUE would be 1.20. The applicant did not provide calculations regarding the original and revised PUEs. Additionally, it is unknown whether the 1.25 PUE figure was based on peak or annual average conditions. Peak PUE represents the worst case—hottest day with all server bays occupied and all servers operating at 100 percent capacity. Annual average PUE is based on annual average site temperatures and less than maximum power loads.

Data Requests

70) Please provide calculations for the project's revised annual average PUE of 1.2 (total facility load divided by total IT load).

Response: The total average IT load for the SJC is 76.8 megawatts and the total average facility load is 92.16, resulting in a PUE of 1.2. The total peak facility load is 96 megawatts, resulting in a PUE of 1.25. It should be noted that the PUE for this facility is significantly below the industry average 1.58 according to the Uptime Institute recent national survey of data centers.[8]

71) Also, please provide the revised project's peak PUE figure, along with the total facility load and the total IT loads used to arrive at this PUE figure.

Response: See the response to Data Request #70 above.

Background

The applicant-selected backup generators for the original project were Cummins diesel gensets for all IT, cooling, and admin loads. In the revised project, the applicant replaced all of the Cummins gensets. The project replaced the IT and cooling load gensets with Enchanted Rock's natural gas ICEs and the administrative gensets with Caterpillar diesel gensets. In the original application, the applicant provided data staff used to calculate the quantities of diesel fuel needed for hours of testing and maintenance for all Cummins diesel generators. This data was provided in barrels per year (bbr/yr). For the revised project, the applicant does not provide the quantities of natural gas and diesel fuel, or data to calculate the estimated fuel quantities.

Data Requests

72) Please provide cut sheets for the Enchanted Rock's natural gas ICEs and the Caterpillar diesel generators.

Response: See Appendix 3-3B, pages 5 to 45 of Transaction Number 239419. For convenience, a copy is provided in **Attachment DR-72**.

73) Please provide the quantities of natural gas and diesel fuel to be used for the hours of testing and maintenance (bbr/yr).

Response: The 1.25 and 0.5 MW administrative diesel generators will consume 92.3 and 34.4 gallons of diesel per hour, respectively (see the background to Data Request #75). Testing each of these engines for 42 hours per year will consume 5,321 gallons per year. Assuming a conversion factor of 42 gallons/barrel, the two diesel generators will consume approximately 127 barrels per year.

The natural gas generators will consume 5,204 cubic feet of natural gas per hour and are expected to operate 8.66 hours per year for testing and maintenance. The annual natural gas consumption will be 10.09 million cubic feet per year or 10,297 MMBtu/year.[9]

[8] https://journal.uptimeinstitute.com/data-center-pues-flat-since-2013/

[9] 5,204 CF/hr * 8.66 hours/year * 224 engines * 1020 Btu/CF = 10,296,805,907 Btu/year

Hazards and Hazardous Materials Data Requests

Background: Hazards and Hazardous Materials

On page 3.9-9 of the Supplemental Filing, the project description states there are 40 standby generators, each with a storage capacity of 9,100 gallons of diesel fuel.

Data Request

74) Please update page 3.9-9, to be consistent with the current revised project description of providing natural gas-fired generators.

Response: **Attachment DR-74** includes a revised Section 3.9 with the number and types of generators corrected.

Background: Fuel Tank Replenishment Strategies

On page 3.3-18 of the Supplemental Filing, the project description specifies that two administrative generators will have a separate diesel fuel tank. On page 3.3-20, the two administrative generators are expected to operate less than 42 hours per year. Assuming each administrative generator is operated for 42 hours per year at their respective fuel usage rates of 92.3 and 34.4 gallons per hour, both generators would together consume 5,435 gallons of diesel fuel annually. Diesel fuel would be used during routine testing and maintenance, and emergencies, if they occurred. Each generator would be run approximately once a month for approximately 25 minutes with 100 percent load on the engine.

Data Request

75) Please provide the fuel tank replenishment strategy and frequency for the administrative generators, and the estimated frequency and number of fuel trucks needing to visit the facility for refueling per year.

Response: The goal is to maintain fuel tanks at 85 percent full. Therefore, the Applicant expects to have one fuel truck delivery each calendar quarter to fill the administrative generators diesel tanks.

Background: Urea or Diesel Exhaust Fluid (DEF)

On page 3.3-16 of the Supplemental Filing, the project description specifies the use of urea or diesel exhaust fluid (DEF) being used during the selective catalyticreduction (SCR) process. The SCR would not likely be fully functional during routinemaintenance and testing events.

Data Requests

76) Please provide a safety data sheet for the DEF and confirm the estimated shelf life of the DEF.

Response: **Attachment DR-76** provides a safety data sheet for DEF that shows a shelf life of 2 years depending on storage temperature.

77) Please provide an estimate of how much DEF would be used in a year per diesel engine.

Response: The 1.25 MW administrative diesel engine consumes 5.1 gallons of DEF per hour or 214 gallons per year. The 0.5 MW administrative diesel engine consumes 1.7 gallons of DEF per hour or 71 gallons per year, for a combined 285 gallons per year for both generators.

78) Please provide a DEF replenishment strategy and frequency, and how any excess or degraded DEF, if any, would be disposed of properly.

Response: As noted in the response to Data Request #75, the DEF tanks are expected to be filled once per calendar quarter. The DEF will be delivered by the same vendors that deliver diesel fuel and there are numerous diesel fuel suppliers located in the City of San José. Furthermore, DEF is widely available and can be purchased from automotive parts stores, most gas stations, and supercenters (Walmart and Costco). It is not anticipated that the project would experience degraded DEF that would require disposal.

If, however, in the unlikely event DEF would need to be disposed, the project would contract with the DEF supplier and delivery vendor to pump out the DEF from the tanks and haul it offsite for proper disposal or recycling in accordance with the vendor's applicable permits.

79) Please provide a schematic showing if the DEF would be located in a secondary containment.

Response: The schematics for the double-walled High Density Polyethylene DEF tanks for the 1.25 and 0.5 MW administrative generators are presented in **Attachment DR-79**. The 1.25 MW administrative generator's DEF tank is a 162-gallon tank and the 0.5 MW administrative generator is an 84-gallon tank.

Background: Natural Gas Supply Lines

On page 2-3 of the Supplemental Filing, the project description states the project will include two separate natural gas supply lines at the southern border of the project site, which uniquely provides redundancy in the natural gas supply. Each line will run directly south from the project boundary to Pacific Gas and Electric Company's (PG&E's) existing gas lines. One natural gas supply line will interconnect with Line 109 and the other with Line 101.

Data Requests

80) Please provide the natural gas supply line pressure prior to connecting to the natural gas-fired generators.

Response: The onsite natural gas system will have an operating pressure of 125 pounds per square inch gage (PSIG).

81) Please provide the natural gas pressure required at each 0.45 MW natural gas-fired generator.

Response: The engine vendor, Enchanted Rock, indicates the engines will accept natural gas between 80-125 pounds per square inch gage (PSIG).

82) In the event of an earthquake or accident, please describe how the natural gas supply lines would be automatically shut-off or isolated to prevent natural gas being released to the project site.

Response: Emergency Gas Shutoff valves are located at the point of gas custody transfer from PG&E in the gas metering yard located in the southern portion of the SJC site. These Emergency Gas Shutoff valves electronically communicate with the Data Center's Operation Center for operators to close the valves. In addition, each natural gas generator includes a natural gas leak detector that in the event of a detected leak, an isolation valve is automatically closed on the gas header feeding the generators.

Land Use and Planning Data Requests

Background: Exemption from Natural Gas Prohibition

The Supplemental Filing provides a general discussion of multiple ways the project could be exempt from the City of San Jose's prohibition of natural gas infrastructure. The applicant states on page 3.11-9:

> *Section 17.845.030 of the (City of San Jose) Municipal Code prohibits natural gas infrastructure within newly constructed buildings and natural gas infrastructure extending into any system or device within a building for which an equivalent all-electric system or design is available. However, Section 17.845.040(B) provides an exception to the prohibition of natural gas infrastructure for facilities with a distributed energy resource that protects public health, safety, or economic welfare in the event of an electric grid outage, until December 31, 2024. The project would include 224 natural gas-fired generators, which will operate for load shedding, demand response and behind the meter RA in support of the electric grid as well as provide emergency power to the Project. Therefore, the project meets the necessary operational requirements for the protection of public health, safety, and economic welfare in the event of an electric grid outage. With concurrence from the City of San Jose, the project would be eligible for the exception provided under Section 17.845.040(B) of the Municipal Code. Further, the Applicant may apply for the Limited Exemption for Manufacturing and Industrial Facilities or the Hardship Exemption provided under Sections 17.845.045 and 17.845.050 of the Municipal Code, respectively.*

Data Request

83) Please provide a focused, specific description of the basis for how the project is exempt from the natural gas infrastructure prohibition discussed in Section 17.845 of the City of San Jose Municipal Code and correspondence with the City confirming the exemption.

Response: The City's Municipal Code 17.845 prohibits the installation of natural gas infrastructure in newly constructed buildings for which an all-electric system or design is available. However, Section 17.845.040(B) states the following:

> "The requirements of this Chapter shall not apply to facilities with a physical connection to the electrical grid and a Distributed Energy Resource for necessary operational requirements to protect the public health, safety, or economic welfare in the event of an electric grid outage, until December 31, 2024.

The data center would be critical infrastructure supporting data storage and data processing needs, facilitating communications via internet connections. Such critical infrastructure reliability is critical to protecting the public health, safety, and economic welfare in the region.

The natural gas generators proposed for SJC do not have an equivalent all-electric system or design available. The primary purpose for proposing the natural generators is to provide electrical power to SJC in the event that PG&E is unable to provide electrical power to the facility's onsite substation. No all-electric system or design can replace the natural gas generators given the size of the project site. Installation of energy storage would require substantially more space than the current natural gas generators, and other non-fossil fuel generation technologies cannot provide the required availability of the proposed natural gas generators with the redundant natural gas connections.

The City's Municipal Code (Section 17.845.020 E) defines "distributed energy resource" as means an electric generation or storage technology that complies with the emissions standards adopted by the State Air Resources Board pursuant to the distributed generation certification requirements of Section 94203 of Title 17 of the California Code of Regulations, or any successor regulation. Section 94203 of Title 17 of the California Code of Regulations requires that after January 1, 2007, fossil fueled distributed generation units meet specific emission limits of 0.07 pounds of Oxides of Nitrogen per megawatt-hour,

0.10 pounds of carbon monoxide per megawatt-hour, and 0.02 pounds of volatile organic compounds per megawatt-hour.

The Applicant intends to participate in PG&E's Base Interruptible Program (BIP). This program was designed to reduce electrical loads on PG&E's system when the California Independent System Operator issues a curtailment notice. The SJC project is directly connected to PG&E's electrical grid with two redundant connections from the onsite SJC substation to the PG&E Los Esteros Substation. Furthermore, participating in PG&E's BIP program will require SJC to reduce their load by disconnecting the project from the electrical grid and self-generating the required electrical load with the natural gas generators, making that quantity of electric power available to PG&E's grid, assisting the utility in protecting the public health, safety, or economic welfare during an electric grid emergency.

The SJC project satisfies the intent and requirements of San Jose Municipal Code Section 17.845.030 to be considered a facility with a distributed generation resource. Finally, as noted in the response to Data Request # 66, the Applicant has provided documentation that the natural gas generators comply with Section 94203 of Title 17 of the California Code of Regulations for fossil fueled distributed generation unit's emission limits of 0.07 pounds of Oxides of Nitrogen per megawatt-hour, 0.10 pounds of carbon monoxide per megawatt-hour, and 0.02 pounds of volatile organic compounds per megawatt-hour. Therefore, the SJC project complies Section 17.845 of the City of San Jose Municipal Code.

The Applicant has consulted with the City and is awaiting a response to confirm applicability of the foregoing exemption(s).

Project Description Data Requests

Background

The Supplemental Filing indicates that the natural gas backup generators would provide load shedding, demand response, and resource adequacy ancillary services. Staff needs to understand how these services would be provided.

Data Request

84) Please explain how the backup natural gas generators would respond to load shedding, demand response and resource adequacy ancillary services when they are not connected to the grid.

Response: The natural gas generators will be available for grid services to CAISO, primarily through PG&E's Base Interruptible Program (BIP). BIP currently requires a 30-minute response to an event dispatch and requires participants to be available up to 180 hours per year[10]; however, historically it has not been called more than 30 hours annually in the last 12 years.[11] Table DR84-1 provides a summary of the BIP events and the number of hours of operation. The BIP is only called when CAISO determines a Stage 1, Stage 2, or Stage 3 emergency, or a transmission system contingency is needed to support the grid.

Table DR-84 Summary of PG&E BIP Events

Year	Sum of Hours	BIP Events
2009	2	1
2010	2	1
2011	2	2
2012	2	1
2013	8	2
2014	14	4
2015	8	3
2016	4	1
2017	3	2
2018	12	3
2019	8	3
2020	28	7
2021	2	1
Total	**95**	**31**

In a non-grid outage situation, PG&E will issue a dispatch notification to Microsoft and Enchanted Rock to reduce load within the 30-minute timeframe. Enchanted Rock and Microsoft will coordinate operations to start up the generators and transfer the facility load from the grid to the generation within the required timeframe. During the BIP event, Microsoft load will be completely disconnected from the utility to run on natural gas generators. Once PG&E ends the BIP event, Enchanted Rock and Microsoft will coordinate a transition back to grid power.

In a situation where a BIP event is called and grid power has been lost, Microsoft will already be running on backup generation and will remain on backup generation until the BIP event is over and grid power is restored.

[10] https://www.pge.com/en_US/large-business/save-energy-and-money/energy-management-programs/demand-response-programs/base-interruptible/base-interruptible.page

[11] https://www.pge.com/en_US/large-business/save-energy-and-money/energy-management-programs/demand-response-programs/case-studies/case-studies.page

Background

The Supplemental Filing has a discrepancy concerning the proposed connection of the natural gas pipelines. There are references to the two proposed gas pipelines connecting to existing PG&E pipelines under Alviso-Milpitas Road and also at Ranch Drive. For example, Figure 1.2R shows the connection to what is Alviso-Milpitas Road but the text in Section 2.1.6, page 2-5, reads:

> *The project will include two separate natural gas supply lines at the southern border of the project site, which uniquely provides redundancy in the natural gas supply. Each line will run directly south from the project boundary to PG&E's existing gas lines located within Ranch Drive. One natural gas supply line will interconnect with Line 109 and the other with Line 101. Each gas supply line will be approximately 75 feet in length.*

Earlier, in Section 1.2, page 1-7, the text reads:

> *Natural gas will be provided by Pacific Gas and Electric Company (PG&E) via two independent pipeline interconnections; one to natural gas Lines 101 and another to Line 109, both located within Alviso-Milpitas Road located adjacent to the southern portion of the project site.*

Alviso-Milpitas Road is directly south of the project site. Ranch Drive is about 1/3 of a mile to the northeast of the project site. It appears there is some confusion in various sections of the SPPE application as to the name of the road directly southof the project site.

Data Request

85) Please identify the correct pipeline connection location and revise the application as needed.

Response: Figure 1.2R shows the correct location of the natural gas interconnection. **Attachment DR-85** presents a redline version of Section 2.0 of the supplemental SPPE Project Description section with "Ranch Drive" replaced with "Alviso-Milpitas Road".

Utilities And Service Systems Data Requests

Background

The Supplemental Filing states that the corridors for linear project features would be 75 feet from each side of the linear centerline (TN 239411, page 2-26). Figure 2-7R, however, indicates that the linear corridors would be 100 feet wide (TN 239411).

Data Request

86) Please identify the correct linear corridor width.

Response: The correct linear corridor width is 100 feet wide.

Background

In the original SPPE application, the project's total water demand was approximately 29 acre-feet per year (AFY). In the revised project where diesel backup generators would be replaced with natural gas generators, the project's expected water demand jumped to approximately 535 AFY, which is more than 18 times the original amount. The applicant did not provide any information regardingthis substantial increase in the water demand.

Data Request

87) Please explain why the project's water demand has increased to 535 AFY.

Response: The original SPPE water use design was based on each colo using up to 7.4 megawatt's (MW) of electricity with the same type of wet/dry hybrid fluid coolers, but the original design utilized 17 total fluid coolers of which only 15 were operating at any time. The Supplemental SPPE filing's design assumes up to 9.6 MW of electricity use per colo, requiring 3 additional fluid coolers (for a total of 20). The Supplemental SPPE design assumed that 18 hybrid fluid coolers will be operating at any time.

The Applicant consulted the fluid cooler vendor regarding water consumption and after careful consideration, they indicated that recycled water use at SJC is not expected to exceed 423 acre-feet per year. The original design assumed a higher number of "dry cooling" hours before needing to change from dry cooling to wet cooling. However, the changeover temperature for dry to wet cooling is at an ambient temperature of 46.5 degrees Fahrenheit. This requires the fluid coolers to operate in a wet cooling mode when ambient temperature is above 46.5 degrees Fahrenheit, which for the project site is 8,074 hours or 92 percent of the year.

Nevertheless, as explained further below, the SJC project's increased water demand of 423 acre-feet per year (AFY) of recycled and less than 1 AFY of potable water is still less than the total water demand analyzed in the Water Supply Assessment prepared for the previous project proposed at the site. Additionally, to reduce potential potable water impacts, the project is using recycled water for its cooling needs.

Background

Sections 10910 et seq. of the California Water Code set forth the circumstances in which CEQA lead agencies must seek preparation of, or prepare themselves, water supply assessments (WSA) for proposed projects that meet certain criteria. One of the criteria is if a project's water demand is equal to or exceeds the total demand of 500 dwelling units. In the state of California, the demand of a dwelling unit ranges from 0.25 to 0.5 AFY, depending on several factors, such as the area and the cost of water, among many other. Using those numbers, the demand of 500 dwelling units is between 125 and 250 AFY. Since the demand of the revised San Jose Data Center project would be exceed the total for 500 dwelling units, it meets this criterion and thus a WSA is needed.

A fundamental task of a WSA is to determine whether total projected water supplies available during normal, single-dry, and multiple-dry water years will meet the projected water demand associated with a proposed project, in addition to the water supplier's existing and planned future uses. When making such a determination, the authors of the WSA must address several factors including information regarding existing water supplies, projected water demand, and dry year supply and demand. Suppliers are expressly permitted to rely on information contained in the most recently adopted Urban Water Management Plans, so long as the water needed for the proposed project was accounted for therein.

In the original SPPE application the applicant relied on a WSA that was prepared by the city of San Jose for a previous version of the San Jose Data Center. The water demand for that project was approximately 130 AFY. The city determined that it had sufficient supplies to meet the previous project's needs. CEQA allows a project to tier off an approved Environmental Impact Report (EIR) if the impact of a newly proposed project was accounted for in the approved EIR, or if the impact of the newly proposed project is comparable to that of the project for which the EIR was approved if that project has been canceled. However, the impact is substantially greater than that of the canceled project (535 AFY vs. 130 AFY). The assumption that the conclusion of the previous WSA that sufficient water supply was available for the project would still apply to the revised project, whose water demand is more than four times that of the project for which the WSA was prepared, is not valid.

Staff would like to know if the applicant contacted the City regarding the preparation of a new WSA for the revised project and the likelihood that the City would approve the request for total expected water demand (recycled and potable).

Data Requests

88) Please provide any information the applicant might have received from the City of San Jose regarding availability of water (recycled and potable) for the project and the likelihood that the City would grant approval to the project to use recycled water.

Response: The reference to 130 acre-feet per year (AFY) of water demand in the 2017 EIR prepared for the project was specific to potable water. The Water Supply Assessment prepared for the 2017 EIR identified that the proposed project would consume 129.5 AFY of potable water and 1,673 AFY of recycled water.[12] Therefore, the SJC project's increased water demand of 423 acre-feet per year (AFY) of recycled and less than 1 AFY of potable water is still less than the water demand analyzed in the Water Supply Assessment prepared for the previous project proposed at the site.

89) Please consult with the City on the need to prepare a new WSA for the revised project and provide any information the applicant might have regarding the time frame for the City to process the request.

Response: The Applicant consulted with the City to determine if a new Water Supply Assessment for the revised project is required. The City is confirming if the assumptions used in the Water Supply Assessment are still applicable. The Applicant will file the City's response when received.

[12] https://www.sanjoseca.gov/home/showpublisheddocument/20881/636688064827230000

Attachment DR-66
Enchanted Rock Engine Emission Guarantee

ENCHANTED ROCK
The Power is On.

Enchanted Rock, LLC
1113 Vine Street, Suite # 101
Houston, TX 77002
713-429-4091 Phone
281-509-9559 Fax

July 21, 2021

Ms. Jordan Weiszhaar
Microsoft

Via email to jordanw@microsoft.com

Subject: Emission Limits — Enchanted Rock 21.9 L Natural Gas-fired Generator

Dear Ms. Weiszhaar:

Per your request, below are the guaranteed controlled emissions limits for Enchanted Rock's 21.9L natural gas fired generator with updated PM levels and the CARB DG certified emissions package we proposed.

Parameter	lb/MW-hr
Nitrogen Oxides (NOx)	0.070
Carbon Monoxide (CO)	0.100
Hydrocarbons (VOC)	0.020
Particulate Matter (PM10/PM2.5)	0.009

If you have any questions regarding the information presented above, please contact the undersigned via email at nsmith@enchantedrock.com.

Sincerely,

Norman Smith
EVP of Engineering

Attachment DR-68
Bay Area Air Quality Management District Correspondence

From: Frohning, John/SEA
To: Engel, Elyse/SJC
Subject: FW: BAAQMD Cumulative CEQA Health Risk
Date: Monday, October 4, 2021 10:50:24 AM
Attachments: image002.png
image003.png
image004.png
image005.png
image006.png
image008.png
image009.png

FYI

From: Matthew Hanson <mhanson@baaqmd.gov>
Sent: Monday, September 27, 2021 5:10 PM
To: Frohning, John/SEA <John.Frohning@jacobs.com>
Cc: Salamy, Jerry/SAC <Jerry.Salamy@jacobs.com>
Subject: [EXTERNAL] RE: BAAQMD Cumulative CEQA Health Risk

Hi John.

Please see the dataset links and the assumptions below. These links will only be active for 7 days but I am happy to resupply if more time is needed. Note you will need to isolate your project as we are no longer providing IT support for the tool. Let me know if there's anything else.

Highway cancer: highwaycancer.zip
Highway PM2.5: highpm25.zip

Major Road cancer: majstrcancer.zip
Major Road PM2.5: majstrpm25.zip

The datasets are raster files with cancer risk and DPM for all highways/freeways and roadways >30,000 AADT (annual average daily traffic). They show the modeled values for each source (high = highway, majstr = major streets, and rail = rail) in 20 x 20 meter grid cells. The raster files incorporate AADT for that highway using EMFAC 2014 data for fleet mix and **includes** OEHHA's 2015 Guidance Methods.

The Air District assigned vehicle counts on each link using information from the California Department of Transportation (Caltrans) and the Metropolitan Transportation Commission (MTC) for all roads with greater than 30,000 AADT. Traffic counts for state highways are from 2014 while surface streets AADT reflect 2015 counts when available, with older counts from 2010 through 2013 if data were missing. Sources of data used for the activity data are described below.

- State highway activity on the state highway system was represented using 2014 AADT counts from Caltrans. AADT values represent the total traffic volume for the year divided by 365 days, and these counts are reported for state highway segments defined using milepost values. Caltrans provides AADT data for total traffic and for trucks only, with trucks classified by axle number (the two-axle class excludes pickups and vans with only 4

tires).

- Daily traffic counts on surface streets were obtained from Metropolitan Transportation Commission (MTC) which receives roadway counts from local agencies as part of the Highway Performance Monitoring System (HPMS) with the exception of Santa Rosa, which posts the AADT on their web page.

- Year 2014 traffic volumes were forecast to 2017 using county-level growth factors from the California Air Resources Board's (ARB) EMFAC2014 mobile source emissions model. EMFAC2014 was run for all Bay Area counties for 2014, and vehicle miles of travel (VMT) output data were used to calculate the growth factors needed to project 2014 traffic volumes to 2017.

Best Regards,

Matthew Hanson (he/his)
Environmental Planner
Bay Area Air Quality Management District
Planning & Climate Protection Department
375 Beale St. Suite 600 | San Francisco, CA 94105
415-749-8733 | mhanson@baaqmd.gov

From: Frohning, John/SEA <John.Frohning@jacobs.com>
Sent: Monday, September 27, 2021 3:41 PM
To: Matthew Hanson <mhanson@baaqmd.gov>
Cc: Salamy, Jerry/SAC <Jerry.Salamy@jacobs.com>
Subject: RE: BAAQMD Cumulative CEQA Health Risk

Thanks Matthew!
Yes, the ARCMAP dataset should be OK for now.
The segment of SR237 is in the attached figure. This is just West of the Interstate 880 interchange.
Let me know if you would like to discuss.
Regards,
John F.

John Frohning | Jacobs | Air Quality Specialist
O: +01.206.687.7099 | john.frohning@jacobs.com
1100 112th Ave. NE Suite 500 | Bellevue, WA 98004 | USA

From: Matthew Hanson <mhanson@baaqmd.gov>
Sent: Monday, September 27, 2021 3:07 PM
To: Frohning, John/SEA <John.Frohning@jacobs.com>
Cc: Salamy, Jerry/SAC <Jerry.Salamy@jacobs.com>

Subject: [EXTERNAL] RE: BAAQMD Cumulative CEQA Health Risk

Hi John,

Thank you for your patience. The District currently does not have a screening tool for major roadways and highways, and strongly recommends that mobile sources be modeled with EMFAC2021. The 2014 Roadway Screening Analysis Calculator is out of date and is currently being updated. Upon request, we can provide the ARCMAP datasets for the 2014 on-road mobile source cancer risk and PM2.5 concentrations but they may be under conservative. Let me know if you have any other questions or would like the ARCMAP data.

Best Regards,

Matthew Hanson (he/his)
Environmental Planner
Bay Area Air Quality Management District
Planning & Climate Protection Department
375 Beale St. Suite 600 | San Francisco, CA 94105
415-749-8733 | mhanson@baaqmd.gov

From: Frohning, John/SEA <John.Frohning@jacobs.com>
Sent: Friday, September 24, 2021 9:05 AM
To: Wendy Goodfriend <wgoodfriend@baaqmd.gov>; Matthew Hanson <mhanson@baaqmd.gov>
Cc: Salamy, Jerry/SAC <Jerry.Salamy@jacobs.com>; Areana Flores <aflores@baaqmd.gov>
Subject: RE: BAAQMD Cumulative CEQA Health Risk

Hi Wendy,
Thanks for the response.
Have a great weekend!

Matthew, let me know if you would like to discuss.
Regards,
John F.

From: Wendy Goodfriend <wgoodfriend@baaqmd.gov>
Sent: Friday, September 24, 2021 9:03 AM
To: Frohning, John/SEA <John.Frohning@jacobs.com>; Matthew Hanson <mhanson@baaqmd.gov>
Cc: Salamy, Jerry/SAC <Jerry.Salamy@jacobs.com>; Areana Flores <aflores@baaqmd.gov>
Subject: [EXTERNAL] RE: BAAQMD Cumulative CEQA Health Risk

Hi John. Matthew Hanson, included on this email, will help you out with this request. Today is our regular day off so look for info from Matthew sometime next week.

Wendy

Wendy Goodfriend, Ph.D. | Air Quality Planning Manager
Planning and Climate Protection Division
Bay Area Air Quality Management District
Office: 415-749-4641 | Mobile: 415-308-6518

From: Frohning, John/SEA <John.Frohning@jacobs.com>
Sent: Friday, September 24, 2021 8:48 AM
To: Areana Flores <aflores@baaqmd.gov>
Cc: Salamy, Jerry/SAC <Jerry.Salamy@jacobs.com>; Wendy Goodfriend <wgoodfriend@baaqmd.gov>
Subject: RE: BAAQMD Cumulative CEQA Health Risk

Thanks Areana for the followup!

Wendy, feel free to let me know if you require any additional information or would like to discuss.
Thanks,
John F.

From: Areana Flores <aflores@baaqmd.gov>
Sent: Thursday, September 23, 2021 3:33 PM
To: Frohning, John/SEA <John.Frohning@jacobs.com>
Cc: Salamy, Jerry/SAC <Jerry.Salamy@jacobs.com>; Wendy Goodfriend <wgoodfriend@baaqmd.gov>
Subject: [EXTERNAL] RE: BAAQMD Cumulative CEQA Health Risk

Hi John,

Thanks for bringing this to our attention. I am now working on another program but Wendy, Air Quality Planning Manager, should be able to assist you. I have cc'd her above.

Thank you,

AREANA FLORES
PROGRAM LEAD, CLIMATE TECH FINANCE
Bay Area Air Quality Management District
375 Beale St. Suite 600 | San Francisco, CA 94105
415-610-1684 | aflores@baaqmd.gov

From: Frohning, John/SEA
Sent: Thursday, September 23, 2021 3:23 PM
To: Areana Flores
Cc: Salamy, Jerry/SAC

Subject: BAAQMD Cumulative CEQA Health Risk

CAUTION: This email originated from outside of the BAAQMD network. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Arena,
Your contact information was supplied at the bottom of the BAAQMD Risk Screening Guidance to obtain information not currently available within the CEQA Toolkit.

I am assisting a client conduct a cumulative Risk Assessment. As such, we are looking for HRA Screening values for major roadways within 1,000-ft of our project (Risk and PM2.5). We have identified SR237, directly west of Interstate 880 as a segment within 1,000-ft.

Please let me know if you are available to discuss or if you can point me to the correct contact within BAAQMD to obtain the data.

Thanks in advance.
Regards,
John F.

John Frohning | Jacobs | Air Quality Specialist
O: +01.206.687.7099 | john.frohning@jacobs.com
1100 112th Ave. NE Suite 500 | Bellevue, WA 98004 | USA

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Attachment DR-72 Caterpillar Engines Specification Sheets

Image Shown may not reflect actual configuration

Caterpillar 3512C Standby Genset – 1500kW, 480V

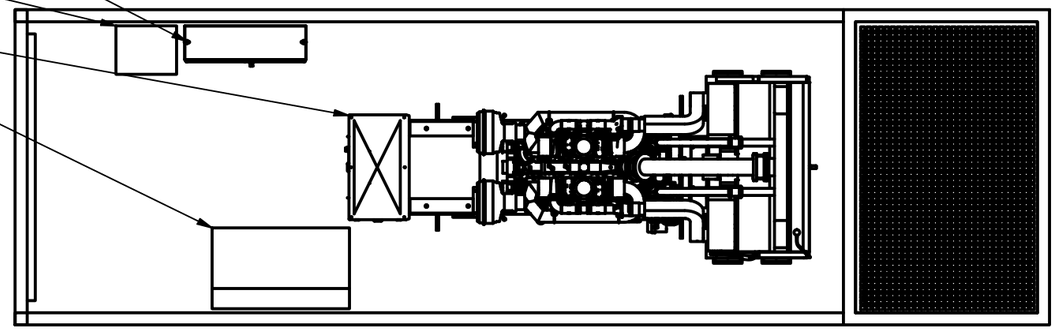
July 7, 2021

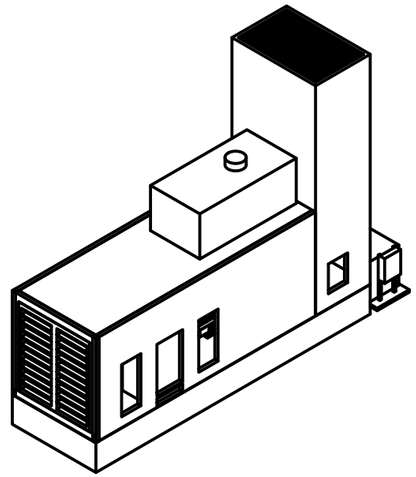
CUSTOMER INTERCONNECT CABINET

HOUSE ELECTRICAL PANEL

CAT 3512C GENSET

BREAKER CABINET W/ CAM-LOKS PANEL





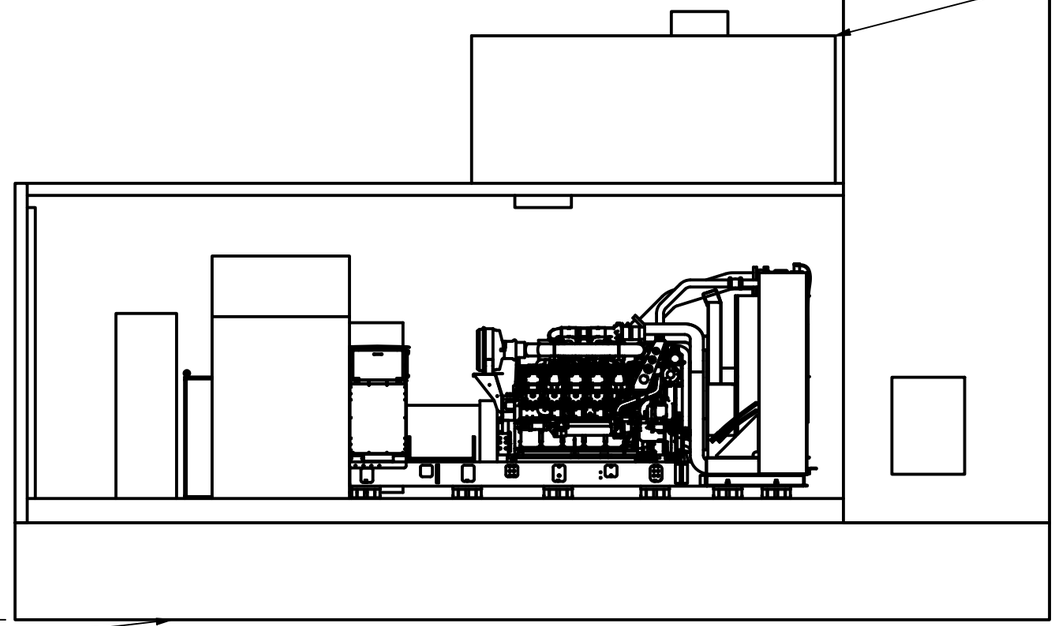
TOP VIEW

35 FT DISCHARGE PLENUM

SCR EMISSIONS CONTROL UNIT

SCR DOSING CABINET W/ DEF TANK

420.00



542" L X 125" W X 552" H
Not including Urea Tank

DIESEL FUEL TANK

RIGHT SIDE VIEW

DRAFT

PETERSON CAT

SAN LEANDRO, CA - HILLSBORO, OR
WEB: WWW.PETERSONPOWER.COM

REV	BY	DESCRIPTION	DATE

PROJECT NAME: RDD

DESCRIPTION: 3512C ENCLOSURE

REFERENCE DRAWINGS:

DRAWING STATUS: PRELIMINARY

DRAWN BY: NMA	PROJECT NUMBER: 21XXXX
CHECKED BY: -	DATE: 07/02/2021
APPROVED BY: -	REV #: -
OVERALL LENGTH: -	WET WEIGHT: -
OVERALL WIDTH: -	DRY WEIGHT: -
OVERALL HEIGHT: -	SCALE: -

NOTES:
-ALL OVERALL DIMENSIONS ARE NOMINAL WITH + 1" TOLERANCE SEE DRAWING FOR ALL DETAILED COMPONENT DIMENSIONS CONSULT FACTORY FOR QUESTIONS AND/OR DISCREPANCIES FOUND
-ALL MEASUREMENTS ARE DISPLAYED IN INCHES
-CENTER OF GRAVITY IS FOR WET WEIGHT

DRAWING NUMBER: RDD-3512C

SHEET NUMBER: 1 OF 1

Cat® 3512C
Diesel Generator Sets

Bore – mm (in)	170 (6.69)
Stroke – mm (in)	190 (7.48)
Displacement – L (in^3)	51.8 (3161.03)
Compression Ratio	14.7:1
Aspiration	TA
Fuel System	EUI
Governor Type	ADEM™ A3

Image shown may not reflect actual configuration

Mission Critical 60 Hz ekW (kVA)	Emissions Performance
1500 (1875)	U.S. EPA Stationary Emergency Use Only. (Tier 2)

Standard Features

Cat® Diesel Engine
- Meets U.S. EPA Stationary Emergency Use Only (Tier 2) emission standards
- Reliable performance proven in thousands of applications worldwide

Generator Set Package
- Accepts 100% block load in one step and meets NFPA 110 loading requirements
- Conforms to ISO 8528-5 G3 load acceptance requirements
- Reliability verified through torsional vibration, fuel consumption, oil consumption, transient performance, and endurance testing

Alternators
- Superior motor starting capability minimizes need for oversizing generator
- Designed to match performance and output characteristics of Cat diesel engines

Cooling System
- Cooling systems available to operate in ambient temperatures up to 50°C (122°F)
- Tested to ensure proper generator set cooling

EMCP 4 Control Panels
- User-friendly interface and navigation
- Scalable system to meet a wide range of installation requirements
- Expansion modules and site specific programming for specific customer requirements

Warranty
- 24 months/1000-hour warranty for standby and mission critical ratings
- 12 months/unlimited hour warranty for prime and continuous ratings
- Extended service protection is available to provide extended coverage options

Worldwide Product Support
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- Your local Cat dealer provides extensive post-sale support, including maintenance and repair agreements

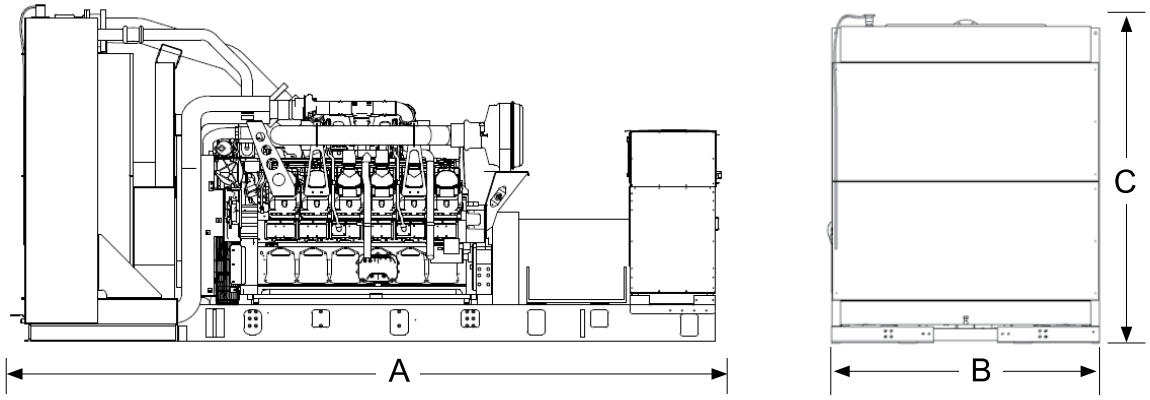
Financing
- Caterpillar offers an array of financial products to help you succeed through financial service excellence
- Options include loans, finance lease, operating lease, working capital, and revolving line of credit
- Contact your local Cat dealer for availability in your region

Package Performance

Performance	Mission Critical	
Frequency	60 Hz	
Gen set power rating with fan	1500 ekW	
Gen set power rating with fan @ 0.8 power factor	1875 kVA	
Emissions	EPA Stationary Emergency (Tier 2)	
Performance number	EM1899-00	
Fuel Consumption		
100% load with fan – L/hr (gal/hr)	395.9	(104.6)
75% load with fan – L/hr (gal/hr)	310.5	(82.0)
50% load with fan – L/hr (gal/hr)	219.7	(58.0)
25% load with fan – L/hr (gal/hr)	128.4	(33.9)
Cooling System		
Radiator air flow restriction (system) – kPa (in. water)	0.12	(0.48)
Radiator air flow – m^3/min (cfm)	2075	(73278)
Engine coolant capacity – L (gal)	156.8	(41.4)
Radiator coolant capacity – L (gal)	234.0	(61.0)
Total coolant capacity – L (gal)	390.8	(102.4)
Inlet Air		
Combustion air inlet flow rate – m^3/min (cfm)	139.8	(4937.2)
Exhaust System		
Exhaust stack gas temperature – °C (°F)	402.6	(756.6)
Exhaust gas flow rate – m^3/min (cfm)	332.3	(11734.1)
Exhaust system backpressure (maximum allowable – kPa (in. water)	6.7	(27.0)
Heat Rejection		
Heat rejection to jacket water – kW (Btu/min)	502	(28541)
Heat rejection to exhaust (total) – kW (Btu/min)	1398	(79477)
Heat rejection to aftercooler – kW (Btu/min)	519	(29539)
Heat rejection to atmosphere from engine – kW (Btu/min)	124	(7072)
Heat rejection from alternator – kW (Btu/min)	74	(4208)
Emissions* (Nominal)		
NOx mg/Nm^3 (g/hp-h)	2373.9	(5.48)
CO mg/Nm^3 (g/hp-h)	237.3	(0.48)
HC mg/Nm^3 (g/hp-h)	51.7	(0.12)
PM mg/Nm^3 (g/hp-h)	13.0	(0.03)
Emissions* (Potential Site Variation)		
NOx mg/Nm^3 (g/hp-h)	2848.7	(6.58)
CO mg/Nm^3 (g/hp-h)	427.2	(0.87)
HC mg/Nm^3 (g/hp-h)	68.8	(0.16)
PM mg/Nm^3 (g/hp-h)	18.2	(0.04)

**mg/Nm^3 levels are corrected to 5% O_2. Contact your local Cat dealer for further information.*

Weights and Dimensions



Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Dry Weight kg (lb)
5920 (233.1)	2281 (89.8)	2794 (110.0)	13 970 (30,790)

Note: *For reference only. Do not use for installation design. Contact your local Cat dealer for precise weights and dimensions.*

Ratings Definitions

Mission Critical
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Applicable Codes and Standards
AS 1359, CSA C22.2 No. 100-04, UL 142, UL 489, UL 869, UL 2200, NFPA 37, NFPA 70, NFPA 99, NFPA 110, IBC, IEC 60034-1, ISO 3046, ISO 8528, NEMA MG1-22, NEMA MG1-33, 2014/35/EU, 2006/42/EC, 2014/30/EU.

Note: Codes may not be available in all model configurations. Please consult your local Cat dealer for availability.

Data Center Applications
- All ratings Tier III/Tier IV compliant per Uptime Institute requirements.
- All ratings ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centers.

Fuel Rates
Fuel rates are based on fuel oil of 35º API [16°C (60ºF)] gravity having an LHV of 42,780 kJ/kg (18,390 Btu/lb) when used at 29ºC (85ºF) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.)

3512 PGFL
LEHE2495-03 (02/20)

PERFORMANCE DATA[EM0831]

July 2, 2021

Performance Number: EM0831 **Change Level: 00**

SALES MODEL:	3512	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	1,800
ENGINE POWER (BHP):	1,818	**HERTZ:**	60
GEN POWER WITH FAN (EKW):	1,250.0	**FAN POWER (HP):**	59.5
COMPRESSION RATIO:	13.5	**ASPIRATION:**	TA
RATING LEVEL:	MISSION CRITICAL STANDBY	**AFTERCOOLER TYPE:**	JWAC
PUMP QUANTITY:	1	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC+AC
FUEL TYPE:	DIESEL	**AFTERCOOLER TEMP (F):**	180
MANIFOLD TYPE:	DRY	**JACKET WATER TEMP (F):**	210.2
GOVERNOR TYPE:	WOODWARD	**TURBO CONFIGURATION:**	PARALLEL
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	2
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	TV9215-48T-2.00
INJECTOR TYPE:	MUI	**COMBUSTION STRATEGY:**	LOW BSFC
FUEL INJECTOR:	1113718	**CRANKCASE BLOWBY RATE (FT3/HR):**	907.5
UNIT INJECTOR TIMING (IN):	86.90	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	8.0
REF EXH STACK DIAMETER (IN):	10	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,244.1
MAX OPERATING ALTITUDE (FT):	2,789		

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	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)
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR
1,250.0	100	1,817	253	0.360	92.3
1,125.0	90	1,638	228	0.353	81.6
1,000.0	80	1,461	204	0.349	71.8
937.5	75	1,373	191	0.349	67.6
875.0	70	1,285	179	0.351	63.6
750.0	60	1,111	155	0.357	55.9
625.0	50	937	131	0.365	48.2
500.0	40	766	107	0.376	40.6
375.0	30	594	83	0.394	33.0
312.5	25	508	71	0.408	29.2
250.0	20	420	59	0.428	25.3
125.0	10	242	34	0.513	17.5

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
EKW	%	BHP	IN-HG	DEG F	DEG F	DEG F	IN-HG	DEG F
1,250.0	100	1,817	63.0	199.2	1,286.2	1,007.0	65	394.2
1,125.0	90	1,638	57.7	195.4	1,186.7	928.6	60	362.3
1,000.0	80	1,461	51.4	191.8	1,110.5	874.4	53	331.5
937.5	75	1,373	47.4	190.0	1,079.6	865.3	50	316.2
875.0	70	1,285	43.4	188.2	1,052.6	858.0	46	300.7
750.0	60	1,111	35.3	185.4	1,009.4	846.0	38	268.9
625.0	50	937	27.6	182.8	971.6	829.2	31	236.3
500.0	40	766	20.5	180.4	925.2	807.3	23	205.0
375.0	30	594	14.1	178.0	864.9	776.8	16	175.0
312.5	25	508	11.2	176.8	826.0	756.7	13	160.6
250.0	20	420	8.7	175.6	780.1	731.2	10	147.0
125.0	10	242	5.0	174.2	655.5	629.9	6	125.7

General Performance Data (Continued)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	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	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,250.0	100	1,817	3,742.9	10,797.8	16,586.9	17,241.6	3,619.6	3,247.8
1,125.0	90	1,638	3,548.8	9,664.8	14,028.0	14,607.0	3,422.9	3,071.3

PERFORMANCE DATA[EM0831]

1,000.0	80	1,461	3,269.7	8,548.4	11,906.1	12,415.3	3,150.5	2,826.9
937.5	75	1,373	3,117.0	8,079.7	11,171.6	11,651.4	2,998.3	2,690.3
875.0	70	1,285	2,962.6	7,641.2	10,510.3	10,961.6	2,851.2	2,558.3
750.0	60	1,111	2,673.1	6,825.6	9,305.6	9,702.0	2,570.4	2,306.3
625.0	50	937	2,390.4	6,023.7	8,110.3	8,452.3	2,297.9	2,061.8
500.0	40	766	2,114.5	5,231.6	6,927.8	7,216.1	2,030.2	1,821.7
375.0	30	594	1,841.9	4,438.1	5,740.0	5,974.3	1,764.7	1,583.4
312.5	25	508	1,707.1	4,039.2	5,140.8	5,348.0	1,632.7	1,465.0
250.0	20	420	1,572.4	3,636.8	4,535.2	4,714.9	1,501.6	1,347.3
125.0	10	242	1,378.1	2,913.7	3,332.0	3,456.3	1,314.9	1,179.8

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM 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
1,250.0	100	1,817	48,053	7,165	81,434	47,028	10,009	12,909	77,039	200,617	213,708
1,125.0	90	1,638	42,254	6,881	70,235	38,839	8,872	10,407	69,461	177,243	188,809
1,000.0	80	1,461	37,361	6,597	61,245	32,186	7,791	8,075	61,962	156,947	167,188
937.5	75	1,373	35,254	6,508	57,685	30,102	7,365	7,000	58,235	148,019	157,677
875.0	70	1,285	33,155	6,426	54,253	28,207	6,938	5,971	54,509	139,229	148,314
750.0	60	1,111	29,004	6,199	47,600	24,738	6,085	4,038	47,105	121,934	129,890
625.0	50	937	24,850	5,914	41,114	21,325	5,232	2,331	39,743	104,789	111,627
500.0	40	766	20,804	5,658	34,871	17,928	4,405	987	32,482	88,107	93,856
375.0	30	594	16,813	5,401	28,745	14,484	3,578	-62	25,201	71,560	76,229
312.5	25	508	14,842	5,257	25,703	12,728	3,157	-493	21,532	63,279	67,408
250.0	20	420	12,869	5,119	22,659	10,934	2,733	-850	17,825	54,949	58,535
125.0	10	242	8,896	4,892	16,530	6,905	1,882	-1,306	10,272	38,061	40,545

Emissions Data

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN		EKW	1,250.0	937.5	625.0	312.5	125.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	1,817	1,373	937	508	242
TOTAL NOX (AS NO2)		G/HR	18,043	12,999	9,036	4,717	2,488
TOTAL CO		G/HR	2,351	1,214	759	669	753
TOTAL HC		G/HR	180	436	427	375	430
TOTAL CO2		KG/HR	1,010	705	500	301	178
PART MATTER		G/HR	350.3	193.7	184.9	260.7	203.8
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	5,447.4	4,928.7	4,935.6	4,113.7	3,263.1
TOTAL CO	(CORR 5% O2)	MG/NM3	709.8	460.2	414.5	583.0	989.4
TOTAL HC	(CORR 5% O2)	MG/NM3	54.3	165.3	233.4	327.3	563.8
PART MATTER	(CORR 5% O2)	MG/NM3	105.8	73.5	101.0	227.3	267.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	2,299	2,169	2,188	1,840	1,497
TOTAL CO	(CORR 5% O2)	PPM	492	333	302	432	728
TOTAL HC	(CORR 5% O2)	PPM	76	241	344	490	836
TOTAL NOX (AS NO2)		G/HP-HR	9.93	9.47	9.64	9.29	10.27
TOTAL CO		G/HP-HR	1.29	0.88	0.81	1.32	3.11
TOTAL HC		G/HP-HR	0.10	0.32	0.46	0.74	1.77
PART MATTER		G/HP-HR	0.19	0.14	0.20	0.51	0.84
TOTAL NOX (AS NO2)		LB/HR	39.78	28.66	19.92	10.40	5.49
TOTAL CO		LB/HR	5.18	2.68	1.67	1.47	1.66
TOTAL HC		LB/HR	0.40	0.96	0.94	0.83	0.95
TOTAL CO2		LB/HR	2,227	1,555	1,101	663	392
PART MATTER		LB/HR	0.77	0.43	0.41	0.57	0.45
OXYGEN IN EXH		%	11.4	11.8	12.7	13.8	15.1
DRY SMOKE OPACITY		%	2.9	2.9	2.9	4.2	5.5
BOSCH SMOKE NUMBER			1.07	1.07	1.07	1.49	1.74

PERFORMANCE DATA[EM0831]

July 2, 2021

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN		EKW	1,250.0	937.5	625.0	312.5	125.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	1,817	1,373	937	508	242
TOTAL NOX (AS NO2)		G/HR	21,651	15,599	10,844	5,661	2,986
TOTAL CO		G/HR	4,232	2,185	1,366	1,204	1,356
TOTAL HC		G/HR	239	580	568	499	571
PART MATTER		G/HR	490.4	271.2	258.9	365.0	285.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	6,536.9	5,914.5	5,922.8	4,936.4	3,915.7
TOTAL CO	(CORR 5% O2)	MG/NM3	1,277.6	828.4	746.1	1,049.4	1,781.0
TOTAL HC	(CORR 5% O2)	MG/NM3	72.2	219.8	310.4	435.3	749.9
PART MATTER	(CORR 5% O2)	MG/NM3	148.1	102.9	141.4	318.2	374.1
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	2,759	2,603	2,626	2,208	1,796
TOTAL CO	(CORR 5% O2)	PPM	886	599	544	778	1,311
TOTAL HC	(CORR 5% O2)	PPM	101	321	458	652	1,112
TOTAL NOX (AS NO2)		G/HP-HR	11.92	11.36	11.57	11.15	12.33
TOTAL CO		G/HP-HR	2.33	1.59	1.46	2.37	5.60
TOTAL HC		G/HP-HR	0.13	0.42	0.61	0.98	2.36
PART MATTER		G/HP-HR	0.27	0.20	0.28	0.72	1.18
TOTAL NOX (AS NO2)		LB/HR	47.73	34.39	23.91	12.48	6.58
TOTAL CO		LB/HR	9.33	4.82	3.01	2.65	2.99
TOTAL HC		LB/HR	0.53	1.28	1.25	1.10	1.26
PART MATTER		LB/HR	1.08	0.60	0.57	0.80	0.63

Regulatory Information

NON-CERTIFIED	1970 - 2100
THIS ENGINE RATING IS NOT EMISSIONS CERTIFIED BY ANY DOMESTIC OR FOREIGN AGENCY.	

Altitude Derate Data

STANDARD

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	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,727	1,709	1,818
1,000	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,797	1,673	1,673	1,818
2,000	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,794	1,763	1,732	1,618	1,618	1,818
3,000	1,818	1,818	1,818	1,818	1,818	1,793	1,761	1,729	1,699	1,670	1,582	1,582	1,806
4,000	1,818	1,818	1,818	1,795	1,761	1,728	1,697	1,666	1,637	1,609	1,545	1,527	1,752
5,000	1,818	1,798	1,763	1,729	1,696	1,665	1,635	1,605	1,577	1,550	1,509	1,473	1,700
6,000	1,767	1,732	1,698	1,665	1,634	1,603	1,574	1,546	1,519	1,493	1,436	1,400	1,648
7,000	1,701	1,667	1,635	1,603	1,573	1,544	1,516	1,489	1,463	1,437	1,364	1,309	1,598
8,000	1,638	1,605	1,574	1,543	1,514	1,486	1,459	1,433	1,408	1,384	1,291	1,236	1,548
9,000	1,576	1,545	1,514	1,485	1,457	1,430	1,404	1,379	1,355	1,331	1,200	1,127	1,500
10,000	1,516	1,486	1,457	1,429	1,402	1,376	1,351	1,327	1,303	1,281	1,091	1,018	1,454
11,000	1,291	1,291	1,291	1,291	1,291	1,291	1,273	1,200	1,145	1,054	982	909	1,291
12,000	1,254	1,254	1,254	1,254	1,254	1,236	1,182	1,109	1,018	945	873	800	1,254
13,000	1,236	1,236	1,236	1,236	1,218	1,145	1,073	982	909	836	782	727	1,236
14,000	1,200	1,200	1,200	1,182	1,109	1,036	945	873	800	745	691	654	1,200
15,000	1,164	1,164	1,145	1,073	1,000	909	836	782	727	673	636	582	1,164

Cross Reference

PERFORMANCE DATA[EM0831]

July 2, 2021

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4486095	GG1079	3855536	GS653	XJ	DB700001	
4577286	GG3664	5157727	PG239	-	LY700001	

Supplementary Data

Type	Classification	Performance Number
SOUND	SOUND PRESSURE	DM8779

General Notes

General Notes EM0831 - 00
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779

Performance Parameter Reference

Parameters Reference:DM9600-12

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

PERFORMANCE DATA[EM0831]

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 15 deg C (59 deg F), where the density is
850 G/Liter (7.0936 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.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.
EMISSION CYCLE LIMITS:
Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.
EMISSIONS DEFINITIONS:
Emissions : DM1176
EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets
test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not

PERFORMANCE DATA[EM0831]

included above, test cycle C1 shall be applied.
HEAT REJECTION DEFINITIONS:
Diesel Circuit Type and HHV Balance : DM9500
HIGH DISPLACEMENT (HD) DEFINITIONS:
3500: EM1500
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
SOUND DEFINITIONS:
Sound Power : DM8702
Sound Pressure : TM7080
Date Released : 07/10/19

GENERATOR DATA

JULY 02, 2021

(AT400240)-ENGINE (BAA126422A)-CEM

For Help Desk Phone Numbers Click here

Selected Model

Engine: 3512	**Generator Frame:** 1488	**Genset Rating (kW):** 1500.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 3434412	**Genset Rating (kVA):** 1875.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 2255.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40915 /40997 /9600

Spec Information

Generator Specification

Frame: 1488 **Type:** SR5	**No. of Bearings:** 1
Winding Type: FORM WOUND	**Flywheel:** 21.0
Connection: SERIES STAR	**Housing:** 00
Phases: 3	**No. of Leads:** 6
Poles: 4	**Wires per Lead:** 4
Sync Speed: 1800	**Generator Pitch:** 0.6667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	375.0	92.1
0.5	750.0	94.7
0.75	1125.0	95.2
1.0	1500.0	95.0

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1172	0.0144
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1270	0.0156
TRANSIENT - SATURATED X'_d	0.2051	0.0252
SYNCHRONOUS - DIRECT AXIS X_d	2.2656	0.2784
SYNCHRONOUS - QUADRATURE AXIS X_q	1.3574	0.1668
NEGATIVE SEQUENCE X_2	0.1213	0.0149
ZERO SEQUENCE X_0	0.0293	0.0036

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	1.9900
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.1800
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0320
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0180
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.1970
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0180
EXCITER TIME CONSTANT T_e	0.0600
ARMATURE SHORT CIRCUIT T_a	0.0270

Short Circuit Ratio: 0.54	Stator Resistance = 0.0028 Ohms	Field Resistance = 0.556 Ohms

Voltage Regulation

Voltage level adjustment: +/-	5.0%
Voltage regulation, steady state: +/-	0.5%
Voltage regulation with 3% speed change: +/-	0.5%
Waveform deviation line - line, no load: less than	2.0%
Telephone influence factor: less than	50

Generator Excitation

	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	15.43 Volts	52.77 Volts	Volts
Excitation current	1.4 Amps	3.95 Amps	Amps

Selected Model

Engine: 3512	**Generator Frame:** 1488	**Genset Rating (kW):** 1500.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 3434412	**Genset Rating (kVA):** 1875.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 2255.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40915 /40997 /9600

Generator Mechanical Information

Center of Gravity

Dimension X	-741.5 mm	-29.2 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

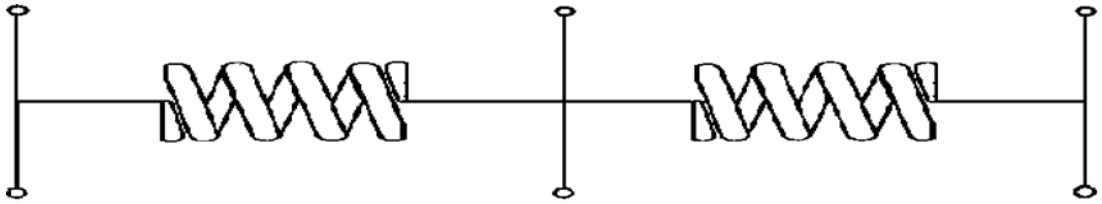
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT = 3200 kg * Rotor WT = 1236 kg * Stator WT = 1964 kg
7,055 LB 2,725 LB 4,330 LB

Rotor Balance = 0.0508 mm deflection PTP

Overspeed Capacity = 125% of synchronous speed

Generator Torsional Data



J1 = Coupling and Fan | **J2 = Rotor** | **J3 = Exciter End**

TOTAL J = J1 + J2 + J3

K1 = Shaft Stiffness between J1 + J2 (Diameter 1)

K2 = Shaft Stiffness between J2 + J3 (Diameter 2)

J1	K1	Min Shaft Dia 1	J2	K2	Min Shaft Dia 2	J3
18.6 LB IN. s^2	162.0 MLB IN./rad	6.7 IN.	208.9 LB IN. s^2	54.7 MLB IN./rad	5.5 IN.	7.1 LB IN. s^2
2.1 N m s^2	18.3 MN m/rad	170.0 mm	23.6 N m s^2	6.18 MN m/rad	140.0 mm	0.8 N m s^2

Total J

234.5 LB IN. s^2

26.5 N m s^2

Selected Model

Engine: 3512	**Generator Frame:** 1488	**Genset Rating (kW):** 1500.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 3434412	**Genset Rating (kVA):** 1875.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 2255.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40915 /40997 /9600

Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:		**Temperature Data: (Ambient 40 ^{0}C)**	
Heat Dissipated:	78.9 kW	**Stator Rise:**	125.0 ^{0}C
Air Flow:	132.0 m^3/min	**Rotor Rise:**	125.0 ^{0}C

Insulation Class: H

Insulation Reg. as shipped: 100.0 MΩ minimum at 40 ^{0}C

Thermal Limits of Generator

Frequency:	60 Hz
Line to Line Voltage:	480 Volts
B BR 80/40	1500.0 kVA
F BR -105/40	1706.0 kVA
H BR - 125/40	1875.0 kVA
F PR - 130/40	1875.0 kVA
H PR - 150/40	1988.0 kVA
H PR27 - 163/27	2062.5 kVA

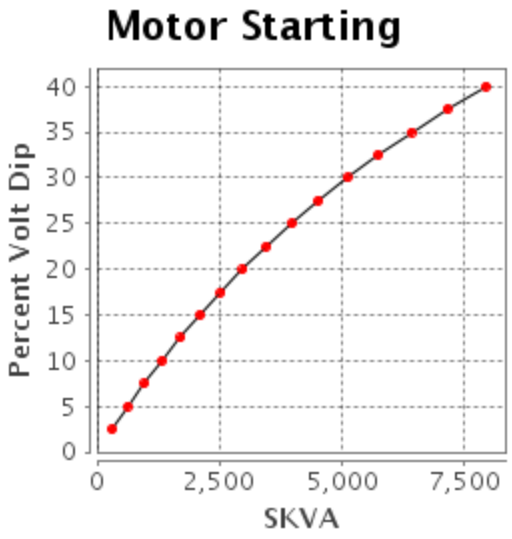
Selected Model

Engine: 3512	**Generator Frame:** 1488	**Genset Rating (kW):** 1500.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 3434412	**Genset Rating (kVA):** 1875.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 2255.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40915 /40997 /9600

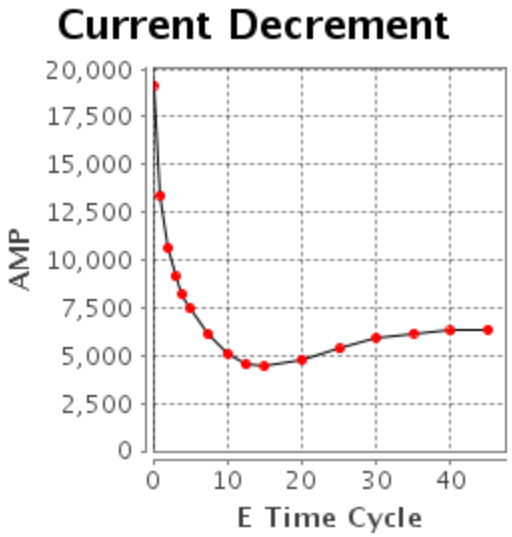
Starting Capability & Current Decrement
Motor Starting Capability (0.4 pf)

SKVA	Percent Volt Dip
305	2.5
627	5.0
965	7.5
1,323	10.0
1,701	12.5
2,101	15.0
2,526	17.5
2,977	20.0
3,457	22.5
3,969	25.0
4,516	27.5
5,103	30.0
5,733	32.5
6,411	35.0
7,144	37.5
7,938	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	19,160
1.0	13,400
2.0	10,638
3.0	9,138
4.0	8,173
5.0	7,453
7.5	6,109
10.0	5,092
12.5	4,517
15.0	4,446
20.0	4,777
25.0	5,347
30.0	5,932
35.0	6,180
40.0	6,289
45.0	6,357



Instantaneous 3 Phase Fault Current: 19160 Amps **Instantaneous Line - Line Fault Current:** 16321 Amps

Instantaneous Line - Neutral Fault Current: 25174 Amps

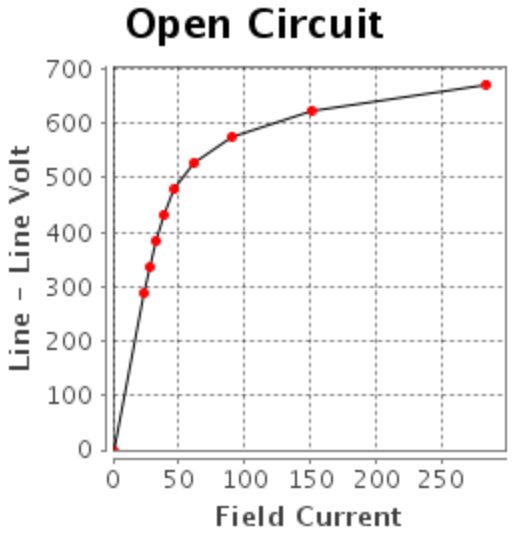
Selected Model

Engine: 3512	**Generator Frame:** 1488	**Genset Rating (kW):** 1500.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 3434412	**Genset Rating (kVA):** 1875.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 2255.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40915 /40997 /9600

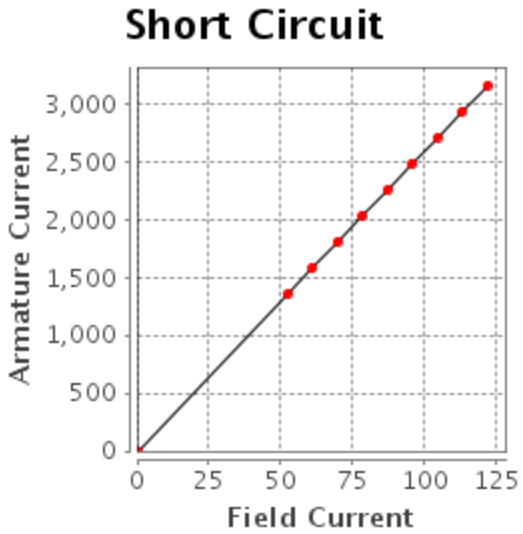
Generator Output Characteristic Curves
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
23.4	288
27.7	336
32.4	384
38.4	432
47.0	480
61.7	528
90.4	576
150.8	624
283.7	672



Short Circuit Curve

Field Current	Armature Current
0.0	0
52.3	1,353
61.0	1,579
69.7	1,804
78.4	2,030
87.1	2,255
95.8	2,481
104.5	2,706
113.2	2,932
122.0	3,157



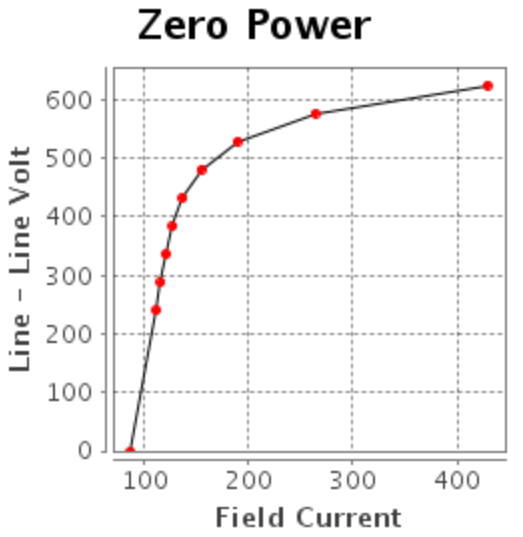
Selected Model

Engine: 3512	**Generator Frame:** 1488	**Genset Rating (kW):** 1500.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 3434412	**Genset Rating (kVA):** 1875.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 2255.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40915 /40997 /9600

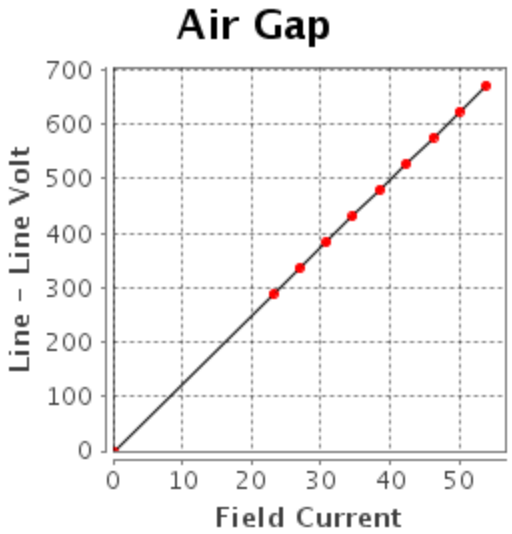
Generator Output Characteristic Curves
Zero Power Factor Curve

Field Current	Line - Line Volt
87.1	0
111.3	240
115.7	288
120.7	336
127.2	384
137.0	432
154.5	480
189.3	528
263.8	576
428.9	624



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
23.1	288
26.9	336
30.8	384
34.6	432
38.5	480
42.3	528
46.2	576
50.0	624
53.9	672



Selected Model

Engine: 3512 **Generator Frame:** 1488 **Genset Rating (kW):** 1500.0 **Line Voltage:** 480

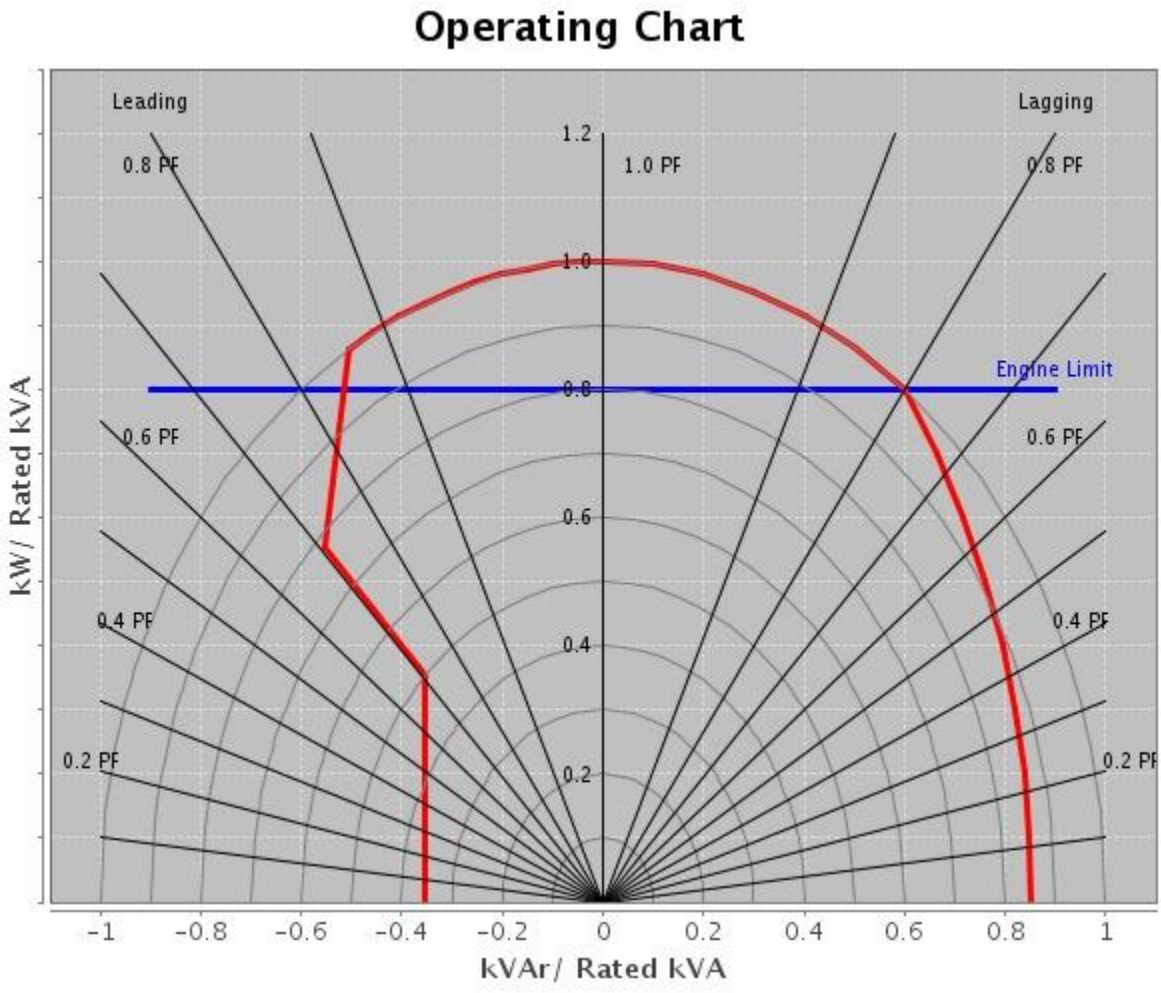
Fuel: Diesel **Generator Arrangement:** 3434412 **Genset Rating (kVA):** 1875.0 **Phase Voltage:** 277

Frequency: 60 **Excitation Type:** Permanent Magnet **Pwr. Factor:** 0.8 **Rated Current:** 2255.3

Duty: STANDBY **Connection:** SERIES STAR **Application:** EPG **Status:** Current

Version: 41205 /40915 /40997 /9600

Reactive Capability Curve



Selected Model

Engine: 3512	**Generator Frame:** 1488	**Genset Rating (kW):** 1500.0	**Line Voltage:** 480
Fuel: Diesel	**Generator Arrangement:** 3434412	**Genset Rating (kVA):** 1875.0	**Phase Voltage:** 277
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 2255.3
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40915 /40997 /9600

General Information

DM7825 Caterpillar SR5 Generators (50 Hz, 60 Hz)
Data for 1400, 1600, 1700, 1800 and 1900 frames Caterpillar SR5 generators built by Leroy Somer - USA and Leroy Somer □ France.

Refer to DM7821 for explanation of all generator data in Technical Marketing Information (TMI) except generator efficiency for which the explanation is given below.

GENERATOR EFFICIENCY
Generator efficiency is the percentage of engine flywheel (or other prime mover) power that is converted into electrical output. The generator efficiency shown is calculated by the summation of all losses method, and is determined in accordance with the IEC Standard 60034. The efficiency considers only the generator. There is no consideration of engine or parasitic losses here.

Refer to DM7829 for low and medium voltage protective setting values a nd limits.

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Project Proposal

Safety Power ecoCUBE® SCR Emission Control System

For (1) x CAT 3512C (1,500 ekW) & (1) x CAT C9 (300 ekW) Diesel Generator Sets

Safety Power Inc
26-5155 Spectrum Way
Mississauga, On L4W 5A1
Canada
www.safetypower.com

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Safety Power is a global innovator and a leading supplier for large stationary engines. Safety Power has the **technical resources** to provide support during installation and throughout the life of the equipment.

Key features and benefits of the proposed system include:

- Safety Power's ecoCUBE® system will be designed with its proprietary **Closed Loop control** system to provide NOx emissions reduction performance throughout varying engine loads while minimizing ammonia slip
- SCR reactor housing, mixing duct are fabricated from durable **409 stainless steel** and the static mixers, turning vanes and injection lance from **304 stainless steel.**
- The proprietary catalyst used in the SCR reactor is a homogeneous design providing superior emissions reduction in a compact configuration with superior spalling and degradation resistance over the life of the catalyst.
- The SCR control and dosing system is designed with an industrial grade **urea injection pump system** for maximum reliability and precise control
- Each ecoCUBE® equipped with DPF includes Safety Power's patented **Internal Diverter Valve** technology that continuously monitors overall system backpressure and will automatically divert a portion of exhaust gas flow to prevent exceeding Engine OEM max allowable back pressure. Passive regeneration of the DPF is promoted without the addition of external heat source.
- All ecoCUBE® emissions control systems are capable of withstanding operating pressures up to 40" W.C., further design pressure can be achieved if required.
- The system supplied comes equipped with **remote monitoring & diagnostics** capability
- The system comes supplied with all necessary exhaust temperature, differential pressure and NOx sensor field instruments for monitoring and control

The ecoCUBE® system proposed by Safety Power has been tested & verified by independent consultants and regulatory authorities to meet some of the toughest global emissions standards.

Included within this proposal is the recommended servicing of the ecoCUBE® units.

Thank you for the opportunity of submitting the following proposal. If you have any questions please do not hesitate to contact me.

Jacob Rozenblit,

Senior Applications Engineer

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DESIGN PARAMETERS

The design of the Safety Power emissions reduction system is based on the following conditions.
Note: NOx is calculated as NO_2.

Table 1 – Engine Data

Engine Type:	CAT 3512C	CAT C9
Application	Stand-by	Stand-by
Engine Power	1500 ekW	300 ekW
Exhaust Temperature	757 °F	927 °F
Design Exhaust Flow Rate	11734 (CFM)	2461 (CFM)
Fuel Type	Diesel	Diesel

Table 2 – Emissions Data at Full Engine Load

Engine Option	Emissions	Catalyst Inlet	Emissions Requirement	Catalyst Outlet
Option 1 - CAT 3512C (1,500 ekW)	NOx (g/HP-h)	5.48	0.50	0.50
	CO (g/HP-h)	0.48	2.60	0.48
	NMHC (g/HP-h)	0.12	0.14	0.12
	PM (g/HP-h)	0.03	0.020	0.020
Option 2 - CAT C9 (300 ekW)	NOx (g/HP-h)	3.95	0.50	0.50
	CO (g/HP-h)	0.24	2.60	0.24
	NMHC (g/HP-h)	0.06	0.14	0.06
	PM (g/HP-h)	0.03	0.020	0.020

Notes: (1) The EPA does not treat methane and ethane as VOC's. Safety Power can achieve a stated reduction of VOC's based on the EPA definition assuming that the VOC's manifest themselves as propene. (2) all emissions reductions are based on an average at steady state using SCAQMD method 100.1 for NOx and SCAQMD/EPA methods 25.1/25.3 for CO and VOC's or mutually agreed test method approved in writing. (3) if NMHC/VOC data isn't provided 0.6 g/hp-hr is to be assumed (unless otherwise stated).

Table 3 – SCR System Data

System Details	Option 1 - CAT 3512C (1,500 ekW)	Option 2 - CAT C9 (300 ekW)
Max. Ammonia Slip @ 15% O2	8 ppm	8 ppm
Urea Consumption - 32.5% solution (+/- 15%)	5.1 USG/hr	0.8 USG/hr
SCR Pressure Loss	17.3" WC	24.0" WC
SCR Inlet/Outlet ANSI Flange Inches	18/18	12/12

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SOUND ATTENUATION

The ecoCUBE® systems will provide the following sound reductions:

Description	Option 1 - CAT 3512C (1,500 ekW)	Option 2 - CAT C9 (320 ekW)
Insertion Loss (IL) dB*	35-42	35-42

***(1) All stated sound reductions assume 1/1 octave band resolution, from 63 Hz to 8000 Hz.
(2) If engine datasheet does not include complete sound data from the 63 Hz to 8000 Hz frequency range, then the above analysis and guarantee is limited to the frequency range that was provided.
(3) Insertion loss (IL) measured based on ISO 6798-1995 in a survey grade 3 environment.
(4) SPL predictions assume hemispherical sound propagation; it does not account for site-specific conditions.
(5) For outdoor or enclosure mounted ecoCUBE®s, acoustic measurement point is assumed to be at least 7 meters laterally from the enclosure wall (or SCR wall if no enclosure), at a height of 1.5 meters above ground.
(6) For indoor ecoCUBE®s, acoustic measurement point is assumed to be to be at least 7 meters from the edge of the stack opening, perpendicular to the axis of the stack.

ecoCUBE® System Scope of Supplies and Services

Table 4 – Components Supplied for Each System

ecoCUBE System Components Description (For Each Engine)	Option 1 - CAT 3512C (1,500 ekW)	Option 2 - CAT C9 (300 ekW)
1. Reactor Assembly (Part Number)	**2 Series (9520-H3D20)**	**2 Series (9520-H3C02)**
1.1 ecoCUBE system configuration	SCR + DPF	SCR + DPF
1.2 ecoCUBE SCR Reactor assembly 409 s/s c/w temperature, pressure and NOx sensors	1	1
1.3 Reactor assembly weight with catalyst	8,250 lbs	4,150 lbs
1.4 SCR Catalyst - layers of catalyst material (each system)	3	3
1.5 DPF Filter Modules	20	02
2. Control and Dosing Assembly		
2.1 Control Panel – with embedded control, on-off switch, on-off status indicator light, and power distribution. Ability for remote monitoring and troubleshooting if Internet connection provided. Dosing System – with automatic flow rate adjustment, system purge valve, air regulator, air pressure switch, check valves, overpressure regulator and injection valves, injection pumps.	Included	Included
3. Insulation of each ecoCUBE with 4 inches MW insulation and metal cladding. Note: skin surface temperature does not exceed 70 deg C except for exhaust and access door flanges.	Included	Included
4. Duration of warranty (warranty is limited to parts only):	30 months	30 months
5. Commissioning (excludes travel expenses)	Included	Included
6. Technical Support Services - (hrs) total	20	20
7. Operation & Maintenance Manuals (digital version)	Included	Included

SCR COMMISSIONING/TRAINING

Our normal practice is to complete this activity on a time and material basis to allow greater flexibility to meet the customer's schedule. Proposal includes 2-day cost allowance per engine as noted above plus technical support during design and installation as noted. Any additional time required as a result of delays not caused by Safety Power will be charged at $1,200 per day or part thereof. Travel and living will be charged at cost.

SCR commissioning requires a customer supplied load bank to operate the generator at various load points and establish the controls load map. The customer should allow 4 hours per machine for the SCR load map to be established, 4 hours of testing and verifying SCR system operation, and where required, 1 hour for a third party witnessing of the SCR operation and performance.

The customer MUST provide a minimum of 2-weeks notification for the scheduling of the SPI pre-commissioning inspection and a minimum of 2-weeks between pre-commissioning and commissioning activities.

SYSTEM MAINTENANCE

The honeycomb catalyst installed in the ecoCUBE® system is supplied by Safety Power to ensure reliable performance over the life of the system. Operating in accordance with the manufacturer's recommendations the catalyst is warranted from defects 8,000 operating hours or 2-years pro-rata, whichever comes first. Periodic inspection of the catalyst by measuring and noting the differential pressure across the catalyst should be the only maintenance required over the life of this system.

NOTE: Safety Power's Warranty coverage does not negate the requirement for annual maintenance and inspection of the system to ensure peak performance. During the Warranty Period any parts found to be defective will be replaced at no additional charge. Safety Power recommends a minimum of one visit per year to inspect, clean and adjust the system.

PERIODIC INSPECTION

1. Prior to operation of the generator check urea tank and top up if necessary. Use a urea concentration analyzer to verify that the urea is at a concentration of approximately 32.5% by weight.

2. Visually inspect all urea fittings, dosing pump, urea lines for signs of leaks and correct if necessary. Leaks will be evident by signs of crystallization.

3. Check SCR control panel for programming faults. If any faults are observed contact your Safety Power™ technical representative.

4. Ensure secure power to the control panel and dosing system.

5. Check that air compressor is operational and receiver is charged and there are no leaks.

ANNUAL MAINTENANCE & TESTING

In order to ensure the reliable operation and performance of the SCR system periodic maintenance is required. Safety Power recommends that the owner enter into a service agreement with Safety Power. Annual maintenance inspections include but not limited to:

Scope of Work (Maintenance, Inspection, Warranty Repairs)

Frequency: Every Twelve (12) Months

Prior to the Measurement & Verification services Safety Power's Technician will carry out the following recommended maintenance & inspection services:

1. Air compressor – inspect and as required adjust pressure for atomization and purging functions.

2. Inspect SCR catalyst - by comparing delta pressure changes since the last inspection found in historical data-logger. Note differential pressure for final report.

3. If included, inspect DPF cartridges – by comparing delta pressure (dP) changes since last inspection found in historical data-logger. Note dP pressure for final report.

4. Check injection lance - done by verifying flow at various engine loads. Once every 500 operating hours (SCR) remove and visually inspect injection nozzle for build-up and wear due to exposure to high temperatures. The lance tip may need replacement after several years (5 - 10) as it is exposed to high temperature - the replacement parts are not covered by the Service Agreement.

5. Inspect system for urea and air leaks. Tighten fittings as needed.

6. Inspect dosing pump. Verify pump operation. Typically, the replacement parts may include the gear assembly required after several years (5 - 10) – replacement parts are not covered by the Service Agreement.

7. Check urea level in day tank prior to measurement & verification testing. Check urea concentration using a urea concentration analyzer.

8. Participate in testing of the generator to ensure the total system functions in conjunction with the generator controls.

9. Check control panel PLC software revision and upgrade to most recent revision if applicable. The cost of maintaining the most current revision of software for the SCR system is included in the Service Agreement.

Scope of Work (Measurement & Verification)

Frequency: Every Twelve (12) Months

Sampling will be performed as follows:

- One sample for oxides of nitrogen (NOx) will be collected from the exhaust of each of the generators. Sampling will be performed utilizing a calibrated portable combustion analyzer using accepted procedures for the Determination of Nitrogen Oxides Emissions for Stationary Sources.

- Sampling will be performed at each unit (after approximately 15-minute warm-up period) for a period required to show stable operation of the unit (expected to be 15 to 20 minutes in length).

- Results will be reported as lbs/hour NOx at 15% oxygen.

During sampling Safety Power's Technician will monitor and record the engine loads and other operating conditions including the feed rate of Urea for inclusion in the final report. Safety Power will obtain the manufacturer's specification data for each of the engines to determine exhaust flow rates during testing.

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Technical Guarantee

The system and catalytic material shall be warranted in accordance with the standard Performance & System Warranty (attached).

Safety Power warrants the quality and suitability of the materials, design and construction of the supplies and services and their qualification for the application. Provided the design data is adhered to, Safety Power guarantees the output values as shown in Table 2 and the Performance & System Warranty.

The maximum allowed temperature entering the Catalyst is 950°F (for NOx reduction). Above 950° F, the SCR catalyst activity can be degraded over time. System performance can't be guaranteed if large variations exist in the full load NOx output of the engine (> +/- 20%) while the generator is operating at a steady state electrical output.

If the engine runs with an exhaust temperature below 410°F (for ULSD or Pipe Line Natural Gas), the SCR control system will stop the injection of urea. This will prevent the formation of ammonium (bi) sulfate on the SCR catalyst surface. Full load NOx reduction will not be achieved at exhaust temperatures less than 540°F.

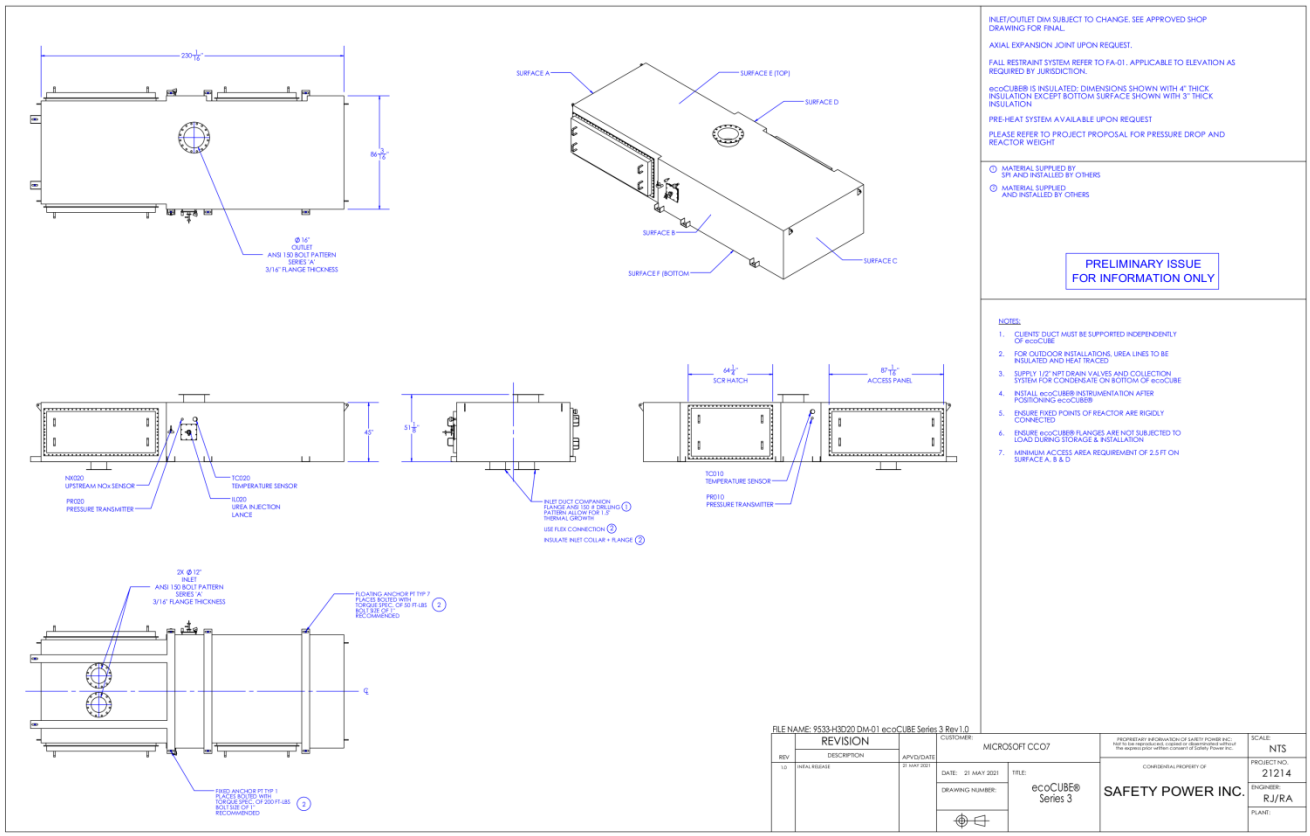
The SCR Catalyst is warranted from defects for a period of 8,000 hours (2-years pro-rata), based in accordance with the operation manual. If the proposed system also includes an Oxidation Catalyst or Oxidation Catalyst Modules, this catalyst is warranted for 8,000 hours (2-years pro-rata), based in accordance with the operation manual. Any deficiencies in the supplies and services provided by Safety Power must be reported by the buyer in writing without delay. These deficiencies will be remedied to the exclusion of any further guarantee claims and rights, accordingly to our warranty statement and our standard terms and conditions. The supplied equipment, excluding the catalyst and labor, is guaranteed for 12 months starting from the date of commissioning and acceptance of the system but no longer than 18 months after delivery or purchase order required ship date. This warranty is not transferable.

PERIOD OF VALIDITY

This proposal is valid until **30 days** after this proposal date, unless withdrawn, superseded, or revised by Safety Power prior to that date.

Appendix D – System Drawings

Option 1 – 3 Series Wide ecoCUBE (SCR + DPF)



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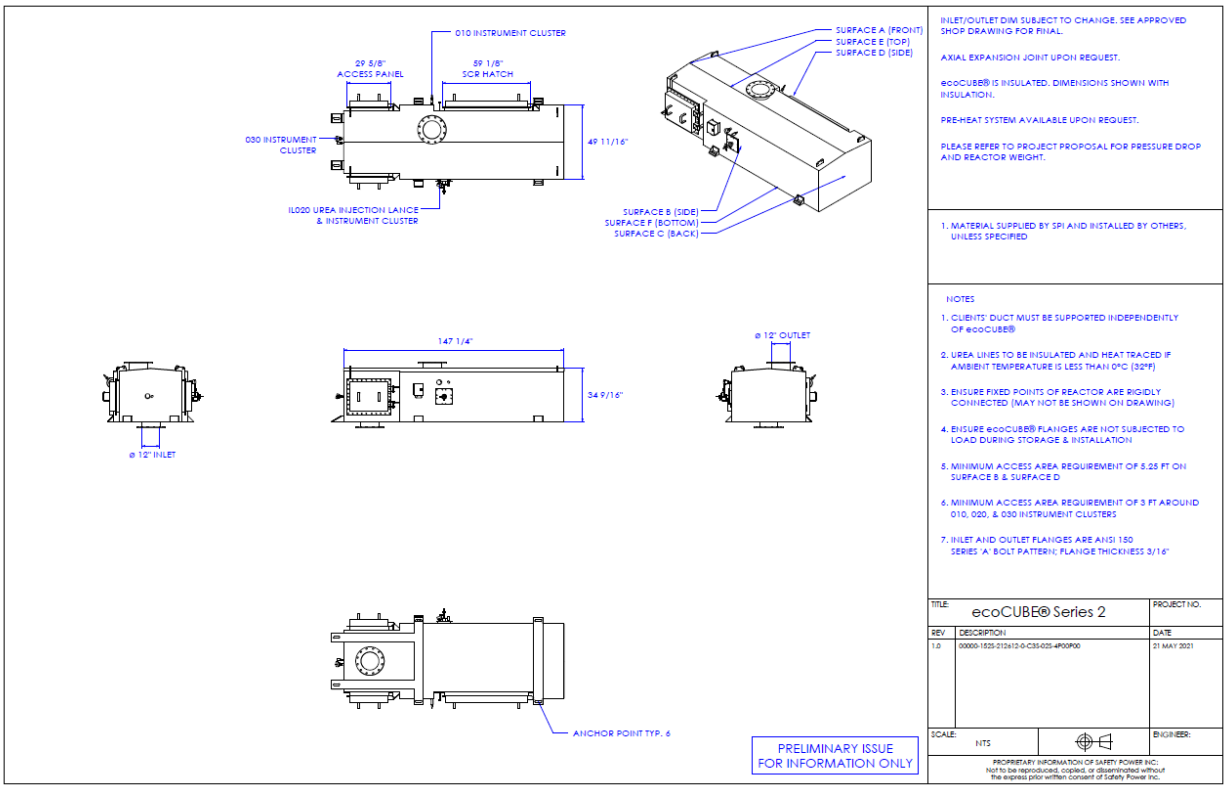
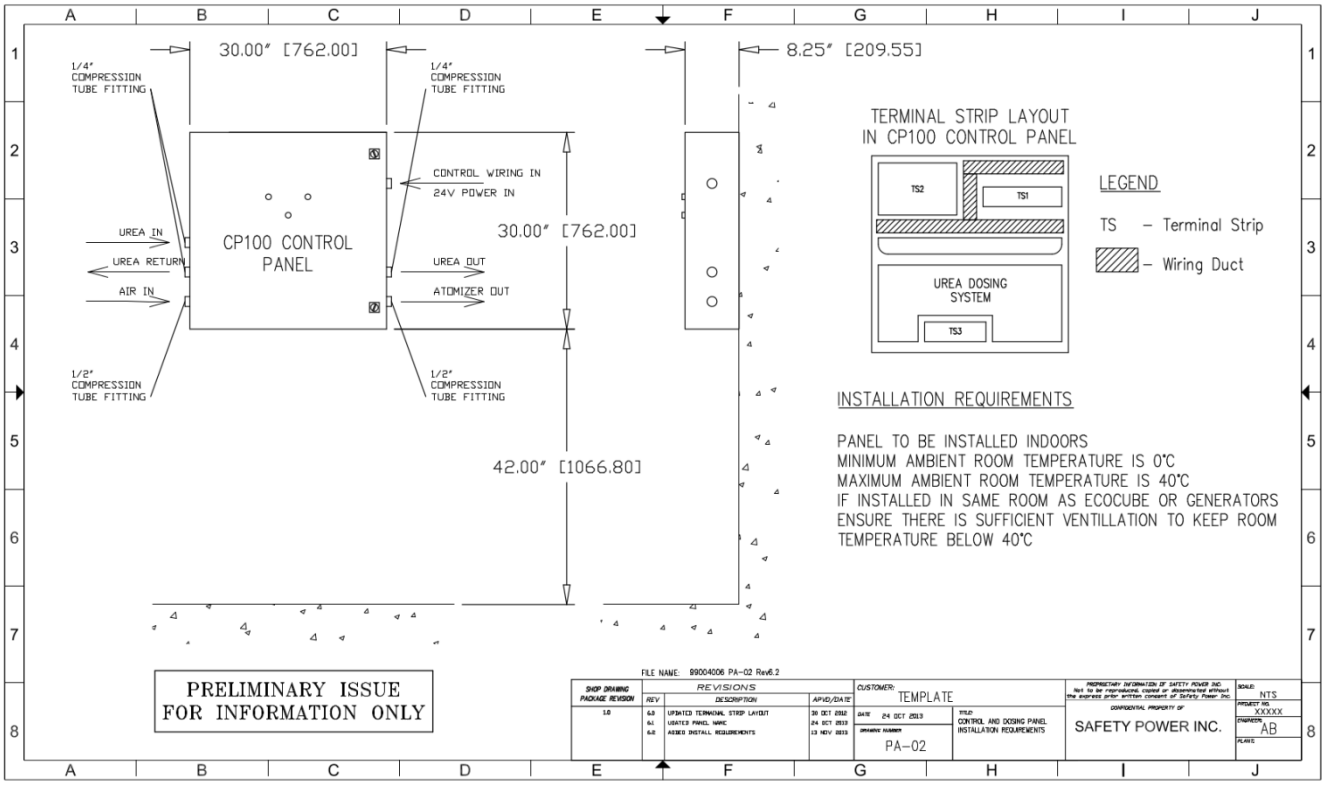
Option 2 – 2 Series ecoCUBE (SCR + DFP)

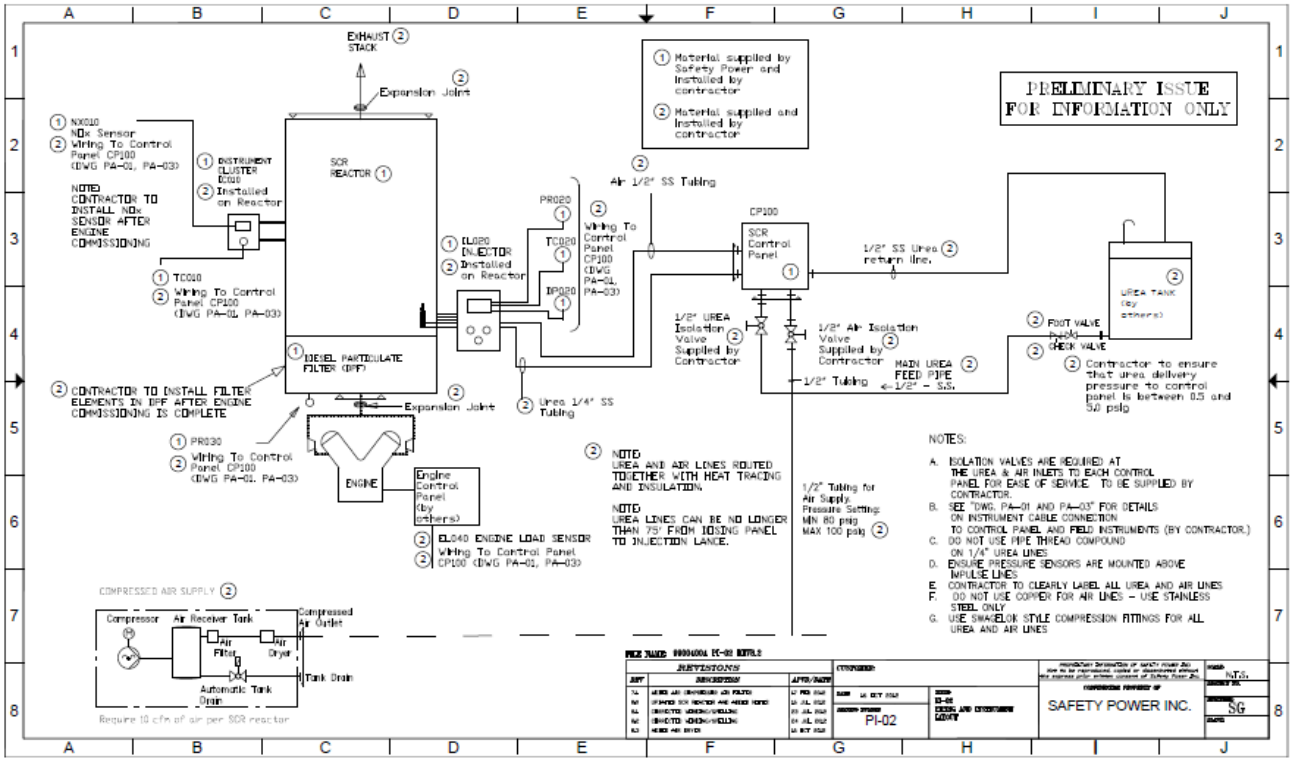


Safety Power Inc
26-5155 Spectrum Way
Mississauga, On L4W 5A1
Canada
www.safetypower.com

Appendix E – Typical Control & Dosing Panels



Appendix F – Typical Piping & Instrumentation



Application & Performance Warranty Data

Project Information

GL-19-003836 - NTE Estimates / Offline

Site Location:	CA
Project Name:	Cummins Power Generation SJC02 500 kW
Application:	Standby/Data Centers
Number Of Engines:	1
Operating Hours per Year:	50

Engine Specifications

Engine Manufacturer:	Cummins
Model Number:	QSX15-G9
Rated Speed:	1800
Type of Fuel:	Ultra-Low Sulfur Diesel (ULSD)
Type of Lube Oil:	1 wt% sulfated ash or less
Lube Oil Consumption:	0.1 % Fuel Consumption
Number of Exhaust Manifolds:	1

Engine Data

Load	Power	Exhaust Flow	Exhaust Temp.	O2	H2O
%	bhp	acfm	F	%	%
100	731	3,442	894	10.0	12.5
75	554	2,771	852	10.0	12.5
50	378	2,245	828	10.0	12.5
25	201	1,418	719	10.0	12.5
10	96	955	541	10.0	12.5

Emission Data

Load (ekW)	Species	Raw Engine Emissions		Tier 4F Emissions Targets	
		g/bhp-hr	ppmvd	g/bhp-hr	ppmvd
100%	NOx*	6.30	1056	0.50	84
	CO	0.30	83	2.6	716
	NMHC**†	0.10	48	0.14	67
	PM_{10}†	0.05	32	0.022	-
75%	NOx*	6.20	948	-	-
	CO	0.50	126	-	-
	NMHC**†	0.12	53	-	-
	PM_{10}†	0.09	53	-	-
50%	NOx*	4.70	594	-	-
	CO	0.50	104	-	-
	NMHC**†	0.22	80	-	-
	PM_{10}†	0.12	58	-	-
25%	NOx*	4.90	477	-	-
	CO	1.40	224	-	-
	NMHC**†	0.36	101	-	-
	PM_{10}†	0.37	138	-	-
10%	NOx*	6.10	358	-	-
	CO	12.40	1194	-	-
	NMHC**†	1.13	190	-	-
	PM_{10}†	0.28	63	-	-

* MW referenced as NO_2

** MW referenced as CH_4. Assumed as 100% unsaturated HCs. Average at steady state per EPA 40CFR60 Method 25A for HC or mutually agreed test method.

System Specifications

Design Exhaust Flow Rate:	
SCR Catalyst Volume:	
System Pressure Loss:	
Sound Target:	
Exhaust Temperature Limits:	572 – 977°F
Minimum Regeneration Temperature[2]:	500°F
Reactant:	Urea
Percent Concentration:	32.5%
System Dosing Capacity:	
Estimated Reactant Consumption:	

Special Notes & Conditions

[1.] Carbon steel housings are suitable for use in all applications where the housing will not be insulated. Carbon steel housings may only be insulated in applications where the exhaust temperature does not exceed 900°F. If your application requires insulation with an engine exhaust temperature exceeding 900°F, a stainless steel housing is required. Customer installed insulation on carbon steel housings in applications where exhaust temperature exceeds 900°F voids any MIRATECH product warranty.

[2.] Diesel Particulate Filters depend on exhaust temperature to keep soot regenerated and the filter back pressure within acceptable levels. If the engine will be operated consistently at low loads/low exhaust temperatures, the customer should make provisions to add load via facility operations or a load bank. Refer to the included Guidelines for Successful Operation of LTR™ DPF.

- Any sound attenuation or emissions reductions listed are based on housing with catalyst elements installed.
- MIRATECH Corporation warrants that the emissions reductions requested for this inquiry will be achieved at the design and test load point as outlined in the proposal. Tier 4 is an engine certificate designation, not an actual tons/yr or g/bhp-hr measurement. MIRATECH will utilize the engine manufacturer's emission data at 100% load to provide our warranty. This is the maximum volume potential point for pollutants to be emitted. Permitting is normally done on a mass flow or tons per year basis, therefore the system will be sized accordingly. The MIRATECH design is to achieve the blended Tier 4 emission targets from the D2 test cycle, measured at 100% engine load conditions.
- Shell Radiated Noise Guarantee requires the purchase and installation of optional external insulation.

[3.] Tier 4 Final emission limits are specified by EPA as a weighted average across a 5-mode cycle. Specific values at various loads are not furnished in the standard

[4.] The terms of the performance warranty are per the MIRATECH General Terms and Conditions of Sale with the following amendments to paragraph 7.2:

Throughout the Warranty Period, Seller warrants that the Product will achieve the emissions levels shown in the table above, subject to the conditions that:

a. the Product is operated and maintained at all times in accordance with MIRATECH's written instructions;

b. the Purchaser's equipment is operated and maintained at all times in accordance with all manufacturer's instructions and guidelines;

c. the Purchaser's equipment, during operation, shall never exceed the Exhaust Emission Data set forth in the Potential Site Emission Variation Values for MSFT SJC02 project submitted to MIRATECH at time of quote

d. the Purchaser's equipment shall be operated within the temperature limits stated in this document after startup;

e. the Purchaser will operate the equipment so the engine emissions & temperature are as stated in the above table and:

1. the NO_x, CO, VOC/NMNEHC, O_2, and PM_{10} will not fluctuate more than 2% from this value and,
2. the Exhaust flow rate will not fluctuate more than 2% from this value and,
3. the Exhaust temperature into the catalyst will not fluctuate more than 10°F from this value.
4. the Exhaust temperature after the SCR catalyst will be above 572°F

[5.] The SCR NOx reduction portion of the system is expected to be active within 1 hour of engine start, at loads greater than 75%.

Attachment DR-74
Revised Section 3.9 Hazards and Hazardous Material Management Section of the SJC Small Power Plant Exemption Application

3.9 Hazards and Hazardous Materials

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

Environmental checklist established by CEQA Guidelines, Appendix G.

3.9.1 Setting

The San José Data Center (SJC) will be located within the City of San José on an approximately 64.5-acre site and will consist of two data center buildings totaling over approximately 396,914 square feet of space. The project will include 224 0.45-megawatt (MW) natural gas-fired generators to provide electrical power to support the electrical load of the data center buildings during utility outages or certain onsite electrical equipment interruptions or failures. Additionally, the use of the natural gas generators will enable the SJC to provide grid support through load shedding, demand response, and behind-the-meter Resource Adequacy (RA) ancillary services. In addition to these generators, the project will include two administrative Tier IV diesel-powered generators, rated at 1.25 MW and 0.5 MW, to support administrative functions during an interruption in the normal delivery of electrical power from the utility.

The project site has been used historically for farming since the early 1920s but is not currently in agricultural use and no dwellings or structures exist onsite[1]. To the north of the project site are the San José/Santa Clara Regional Wastewater Treatment Plant sludge drying beds, to the south is Highway 237, to the west is the Los Esteros Critical Energy Facility (LECEF), a PG&E substation, and to the east is Coyote Creek. The project is anticipated to begin construction in the 4th quarter of 2022, with operations beginning in the 1st quarter of 2024.

[1] There were 2 vacant residences and a storage shed/warehouse onsite, which were demolished in 2021 after a fire significantly affected the safety of one of the dwellings.

3.9.2 Historical Contamination, Investigation, and Remediation

Information on historical contamination, investigation, and remediation at the SJC02 project site was derived from a Phase 1 Environmental Site Assessment (ESA) and a Phase 1 Environmental Site Assessment Update (Cornerstone Earth Group [Cornerstone] 2016) that were included as Appendix I and Appendix J of the Draft Environmental Impact Report, (2017 DEIR), 237 Industrial Center Project (City 2017a), and attached hereto as Appendix 1A. Although the both Phase I ESAs were primarily developed for the project site, windshield surveys and database searches included all offsite utility corridors[2]

The Phase 1 ESA (Cornerstone 2015) was performed in accordance with ASTM International (ASTM) E 1527-13 titled, "Standard Practice for Environmental Site Assessments" (ASTM Standard) and compliance with the U.S. Environmental Protection Agency (EPA) rule entitled, "Standards and Practices for All Appropriate Inquiries; Final Rule (AAI Rule). The Phase 1 ESA documents were prepared in connection with the contemplated sale of the project site by helping to identify Recognized Environmental Conditions (RECs), as defined by ASTM E 1527-13. In addition to a reconnaissance site visit and drive-by observations of adjoining properties, the Phase 1 ESA reviewed database reports from regulatory agencies and selected government agencies to assess past and current site uses and hazardous materials management practices. As part of this work, the Phase 1 ESA included a review of a previously completed Phase 1 ESA (Cardno 2015a) and a Shallow Soil Assessment (Cardno 2015b), as well as a Preliminary Site Assessment for 1595 Alviso-Milpitas Road (ES 1991) that was obtained from the Geotracker Database. The Phase 1 ESA Update (Cornerstone 2016) conducted additional soil sampling and analyses to address unresolved issues related to the former orchard pesticide use and to confirm the status of previous site remediation efforts

3.9.2.1 Subject Property

The site has been used for agricultural purposes (orchards and row crops) since at least the 1920s. although it is not currently in agricultural use. Earliest records indicate that the project site was planted as a pear orchard by the Jackson family around 1923. The project site was acquired by the Cilker family in December 1961, and they reportedly cultivated peaches, nectarines, and apples, along with the existing pear trees. During the time the orchard was in operation, pesticides were applied by vehicle throughout the orchard. Pesticide inventory records were not kept. In later years (circa 1985 to 2000), the Cilker family leased land use privileges to Mr. Tom Mitsuyoshi, who cultivated row crops including lettuce and asparagus. Since the 2000s, the agricultural land has been fallow (Cornerstone 2015).

A Preliminary Site Assessment (ES 1991) was prepared for the project site and the adjacent Santa Clara Valley Water District (SCVWD) property to the east in support of the Coyote Creek Flood Control Improvement Project, which regraded the adjacent eastern property and constructed an earthen levee to channelize Coyote Creek. Observations by Earth Sciences Associates (ES) of the project site at that time indicated the presence of the currently existing structures, as well as a canopy-covered equipment storage area to the north of the existing on-site warehouse The open equipment storage area included mechanical farm equipment, 55-gallon drums, and three above-ground storage tanks (ASTs). The upright drums were unlabeled and mostly empty and were either on pallets or directly upon the soil. One drum containing waste oil was placed within a metal catch pan. A diesel AST (approximately 250 gallons) was located in the east-central portion of the storage area and was reported to be in good condition. A second waste oil AST (approximately 500 gallons) was located in the northwestern portion of the storage yard and, reportedly, showed evidence of overfilling as indicated by staining on the AST and soils beneath it. The third AST was not described (Cornerstone 2015).

Across from the on-site warehouse on the eastern side of the access road, ES (1991) reported various items including stockpiled soil (10 to 15 cubic yards); and scrap metal consisting of old farm equipment, a pile of old car batteries, a pesticide storage trailer, and a diesel AST (approximately 500 to 1,000 gallons). The soil stockpile was believed by ES to have likely originated from the removal of a 3,000-gallon gasoline underground storage tank (UST) in 1988. This gasoline UST removal reportedly occurred near the northeastern corner of the existing on-site warehouse and the canopy-covered farm equipment storage

[2] Although both Phase I ESAs were primarily developed for the project site, windshield surveys and database searches included all offsite utility corridors

area to the north. Initial confirmatory soil sampling results indicated residual total petroleum hydrocarbons as gasoline (TPH-g) and benzene, toluene, ethylbenezene, and xylenes (BTEX) contamination in the UST excavation. An additional unidentified amount of soil was over-excavated from the former UST area in October 1991. TPH-g and BTEX compounds were detected in those confirmatory samples at concentrations up to 840, 0.15, 3.7, 4, and 10 milligrams per kilogram (mg/kg), respectively. In December 1991, three groundwater wells were installed in the former UST area. No TPH-g or BTEX compounds were detected in the soil samples collected from those borings, nor were they detected in any of the groundwater samples collected over four consecutive quarters. The SCVWD (1998) issued a case closure letter for the UST release, stating that no further action was required and that the very low levels of contaminants that remained in on-site soils had not resulted in adverse groundwater impacts. The three onsite monitoring wells in the former UST area were abandoned under permit from SCVWD in 1998.

An additional Phase 1 ESA was incorporated as part of Cornerstone 2015 Phase I. This Phase I ESA prepared by Cardno was conducted for a 13-acre parcel in the northwestern portion of the project site (Cardno 2015a), which concluded that pesticide or herbicide use on the agricultural land represented an REC[3]. [] For that reason, the Phase 1 ESA was followed up with a limited sampling and analysis effort, in which 12 four-point composite samples of shallow soils were collected at an approximate depth of 1 foot (Cardno 2015b). These shallow soil samples were analyzed for organochlorine and organophosphorous pesticides and herbicides, which detected organochlorine pesticides (DDT and related compounds DDE and DDD) at concentrations up to 0.27 mg/kg, 1.4 mg/kg, and 0.093 mg/kg, respectively. No organophosphorous pesticides or herbicides were reported. The DDT, DDE, and DDD results were all below the corresponding EPA Regional Screening Levels (RSLs) for residential/unrestricted property uses, as well as the industrial RSLs. Because the analytical results were less than the corresponding human health-based environmental screening levels (i.e., EPA RSLs), surficial soils were not considered to pose a significant risk for human health; however, risks to ecological receptors were not considered. Furthermore, it should be noted that the sum of the DDT, DDE, and DDD concentrations (commonly referred to as total DDT) in soils, was reported at concentrations (maximum 1.631 mg/kg; average 1.356 mg/kg), which exceed the Total Threshold Limit Concentration (TTLC) of 1.0 mg/kg[4]. Cornerstone stated that onsite soils are not considered a hazardous waste until the soil is discarded or disposed offsite (Cornerstone 2015).

As a follow-up to their Phase 1 ESA, a program of subsurface investigation and laboratory analyses was conducted to address the environmental concerns related to past use of the project site for agricultural purposes (Cornerstone 2016). In particular, the investigation focused on the potential for lead paint soil contamination around existing structures, as well as pesticide contamination in agricultural fields and around existing structures and reported pesticide handling/mixing areas near water sources. The investigation also sought to document environmental conditions associated with former ASTs and USTs and several soil stockpiles that were noted in the Phase 1 ESA. This environmental investigation collected 72 soil samples from 38 locations on the project site using a combination of hand sampling and direct push drilling equipment. Four boring locations were selected near the former AST areas with three soil samples and one groundwater grab sample in each boring that were analyzed for TPH-g and volatile organic compounds (VOCs) (EPA Method 8260B) and diesel/oil range TPH (EPA Method 8015M). Groundwater was observed in the borings at an approximate depth of 20 to 25 feet below ground surface (Cornerstone 2016).

The follow-up environmental investigation detected several organochlorine pesticides in soil samples from agricultural areas and near structures and stockpiles that were mostly less than their respective residential screening criteria (except for 4,4'-DDE, 4,4'-DDT, chlordane, and dieldrin). Lead was also detected in several soil samples greater than residential screening criteria. The reported lead and organochlorine pesticide concentrations did not exceed commercial environmental screening criteria except for a few soil samples collected near a former farm equipment storage area that contained elevated lead concentrations. Arsenic concentrations ranged up to 70 mg/kg, which exceeds its toxicity-based screening levels and regional natural background concentrations that were reported in

[3] Since the Cardno Phase I ESA is located within the project boundaries and limited sampling was conducted, this Phase I ESA is still appropriate for use as it provides information regarding historical contamination at this site.

[4] Under Title 22 of the California Code of Regulations (22 CCR) the TTLC is defined as the concentration at which a solid waste is considered as a hazardous waste for waste disposal classification purposes.

published studies. Elevated lead and arsenic concentrations were detected at the greatest frequency and magnitude in the near surface soil samples. This is consistent with prior agricultural uses of the project site, because lead and arsenic are common components in some pesticides. However, because the elevated concentrations of pesticide components were primarily found within the upper few feet of soil and limited mobility of these components, it was concluded that the likelihood of groundwater impacts from pesticides was low (Cornerstone 2016).

The potential for soluble lead in the near-surface soil samples was evaluated by selective sample testing (i.e., samples with highest total lead concentrations) for Soluble Threshold Limit Concentration (STLC) extraction techniques. The STLC results from those samples exceeded the STLC of 5 milligrams per liter (mg/L), the level at which a solid waste is considered hazardous per Title 22 California Code of Regulations. Cornerstone noted that, similar to what was previously identified for the total DDT concentrations, soils (such as excess soil generated during construction) would be considered as a hazardous waste if there were any plans to remove them from the site (Cornerstone 2016).

The soil and groundwater samples collected from the former AST locations did not detect VOCs or gasoline-range petroleum hydrocarbons above the laboratory reporting limits. Diesel- and oil-range petroleum hydrocarbons were detected in some soil or groundwater grab samples, or both, but at concentrations that were less than their respective residential environmental screening criteria. Based on these findings, Cornerstone (2016) concluded that the former AST locations and the canopy-covered farm equipment storage structure did not significantly affect soil or groundwater environmental conditions. However, since the specific prior locations of the ASTs were not known, it was recommended that protocols be established in a Site Management Plan (SMP) for handling contaminated soils that could be encountered during construction activities.

Cornerstone (2016) also concluded that regulatory agencies would require remedial measures to reduce potential health risks to future occupants of the project site resulting from exposure to pesticide contamination in the soils.

3.9.2.2 Adjacent Properties

The adjacent property to the east, was part of the Cilker property before it was acquired by SCVWD. For the adjacent eastern property, ES (1991) reported that there were two residences and a storage shed. There were two water supply wells near the shed, as well as three groundwater monitoring wells that were installed by Geomatrix, Inc. as part of a study by the U.S. Geological Survey (USGS) for the National Earthquake Hazards Reduction Program. The offsite USGS wells, in the northeastern portion of the property, were used to monitor groundwater levels and indicated groundwater at between 12 and 14 feet below ground surface in 1989. Soil samples were collected by ES at three locations on the easterly property (samples A and B) within agricultural field areas and one location (sample C) collected between the storage shed and residences where pesticide handling was reported. Only samples B and C were analyzed. DDE was reported to have been detected at 0.130 mg/kg in sample B collected at 1 to 1.5 feet below ground surface. The organochlorine pesticide results for sample C were not reported. Analyses of the two soil samples did not detect any compounds based on the other analyses for TPH with BTEX Distinction (EPA Method 8015/8020), TPH (EPA Method 8015); or halogenated volatile organics (EPA Method 8010) (ES 1991).

According to the Phase 1 ESA (Cornerstone 2015), the Geotracker database additionally contained a letter from the San Francisco Bay Regional Water Quality Control Board (SFB RWQCB 1995) entitled *Remedial Action Completion Certificate for Former Cilker Property, 1595 Milpitas-Alviso Road, San José, Santa Clara County, California* along with a case closure summary. This document is associated with a historical pesticide release that is associated with the adjacent offsite eastern property that was originally part of the Cilker property but which, subsequently, was acquired by SCVWD. The associated figure identifying the offsite eastern property was not included in the scan in Appendix F of the Phase 1 ESA; it was not possible to positively identify the actual location, especially since the ‘Site Facility Address’ is given as 1595 Milpitas-Alviso Road (former address). However, as the SFB RWQCB document states that “The former Cilker property was completely regraded and revegetated in late 1992, as part of the Coyote Creek Flood Control Improvement Project. An earthen levee has been built over the site.”, it was concluded that this document actually references the adjacent property to the east of the project site.

While this pesticide release area was not specifically identified in the ES (1991) Preliminary Site Assessment, it is believed that the approximate location is shown as the 'Eastern Portion of Parcel' on Figure 3 of that document and currently lies beneath the realigned Coyote Creek or its associated levees.

The SFB RWQCB (1995) document indicated that 50 soil and debris samples were collected between a depth 0 to 10 feet below ground surface. The organochlorine pesticides DDT, DDD, and DDE in these samples were detected at maximum levels of 20 parts per million (ppm, roughly equivalent to mg/kg), 6.2 ppm, and less than 5.0 ppm, respectively. Following the removal of approximately 42 cubic yards of contaminated soil and debris, DDT, DDD, and DDE levels in confirmatory soil samples from the excavation were 0.45 ppm, 0.16 ppm, and 0.84 ppm, respectively. Groundwater was also collected from six monitoring wells and analyzed for organochlorine pesticides. DDT, DDD, and DDE were detected in these groundwater samples at maximum concentrations of 0.16 parts per billion (ppb), 0.16 ppb, and 0.81 ppb, respectively. These groundwater analytical results exceeded the EPA Regional Screening Levels (RSLs) for tap water for DDD and DDE, 0.031 micrograms per liter (μg/L, roughly equivalent to ppb) and 0.046 μg/L, respectively.

The SFB RWQCB (1995) document also notes that the pesticides Dinoseb and 2, 4-DB were illegally dumped on site in August 1992. These organochlorine pesticides were also part of the onsite soil removal action. Analysis of confirmatory soil samples in the excavation where an additional 6 cubic yards was removed indicated residual concentrations of 2,4-DB of less than 0.20 ppm. There were residual concentrations of Dinoseb: the highest level was 130 ppm at a single location, where only 4 of 22 samples had any detectable levels of Dinoseb. The 130 ppm level, which was inadvertently left on site, is less than the Preliminary Remediation Goal (PRG) for industrial soil but greater than the PRG for residential soil (65 ppb). Analysis of groundwater samples collected from two monitoring wells constructed in this location did not detect any Dinoseb or 2,4-DB.

The adjacent property to the west is currently occupied by LECEF at 800 Thomas Foon Chew Way (formerly 151 Alviso-Milpitas Road). Regulatory records indicate that hazardous materials are used and stored at the LECEF site but, aside from a leaking underground storage tank case listing, the records did not indicate spills or releases of hazardous materials. Regulatory records indicate that a 300-gallon gasoline UST and two 10,000-gallon diesel USTs were removed from the LECEF property under permit from the San José Fire Department in November 2001. Similar to the subject property, the LECEF property had been previously used for agricultural purposes including orchards, row crops, and greenhouses. Records indicate that the gasoline UST was in good condition at the time of removal and the analysis of a confirmatory soil sample did not detect any gasoline-related constituents. Groundwater was not encountered during the gasoline UST removal (Cornerstone 2015).

At the diesel UST locations on the LECEF property, confirmatory soil samples from the bottom of the excavations did not detect petroleum hydrocarbons. Groundwater was encountered in these excavations at a depth of 12.5 to 13 feet below ground surface. Total petroleum hydrocarbons as diesel (TPH-d) was detected at 3,300 μg/L in the groundwater grab sample from one of the diesel USTs (No. 2), but no TPH-d was detected in the other UST (No. 1) excavation. No BTEX or tert-methyl butyl ether constituents were detected in the groundwater samples from either UST excavation. The Santa Clara Valley Water District (SCVWD) issued a case closure letter dated August 15, 2002, stating that "no further action related to petroleum release(s) is required" (Cornerstone 2015).

A third 10,000-gallon diesel UST on the LECEF property reportedly floated to the ground surface during a flood in 1982. Petroleum hydrocarbons were not detected in soil or groundwater samples from this former UST location collected by Lowkey Associates in 2000. A 2002 report by Piers Environmental Services indicates that an additional UST was removed from the LECEF property under Fire Department oversight in July 2002. No oil range petroleum hydrocarbons, TPH-g, TPH-d, or BTEX compounds were detected in the confirmatory soil sample collected from below the UST. Cornerstone (2015) concluded that the former USTs on the LECEF property appear unlikely to have significantly affected environmental conditions for soil, soil vapor, or groundwater on that adjacent property. They also concluded that there were no other offsite spill incidents that appear likely to have affected soil, soil vapor, or groundwater conditions at the subject property.

3.9.3 Regulatory Restrictions

Cornerstone (2015) contracted with Environmental Data Resources, Inc. (EDR) to conduct a search for the project site and associated property liens or activity use limitations (AULs) among Federal databases, such as EPA-listed properties subject to land use restrictions (engineering or institutional controls) or Superfund liens, and State-listed properties maintained by the California Department of Toxic Substances Control (DTSC). The project site was not identified on either the above-mentioned federal or state lists. A Preliminary Title Report by Stewart Title of California (dated May 24, 2013) did not identify any environmental liens for the subject property.

As reported by Cornerstone (2015), Cardno ATC (2015a) had also contracted with EDR to conduct a search for information regarding property liens or AULs but did not identify any in connection with the subject property.

3.9.4 Regulatory Setting

Federal, state, and local laws and regulations govern the use, transport, and storage of hazardous materials. The implementation and enforcement of these local, state, and Federal laws and regulations regarding the use, storage, and transport of hazardous materials (including setbacks for flammable storage from property lines) verify that the potential for impacts to offsite land uses, in the event of an accidental release as a result of the project, will be less than significant with mitigation (as explained further in Section 3.9.5).

The U.S. Environmental Protection Agency (EPA) is the federal administering agency for hazardous waste programs. State agencies include the California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC), State Water Resources Control Board (SWRCB), and the California Air Resources Board (CARB). Regional agencies include the San Francisco Bay Regional Water Quality Control Board (RWQCB), and the Bay Area Air Quality Management District (BAAQMD). Local agencies including the San José Fire Department (SJFD) and the Santa Clara County Department of Environmental Health (SCCDEH) have been granted the responsibility for implementation and enforcement of many hazardous materials regulations under the Certified Unified Program Agency (CUPA) program. The Santa Clara Valley Water District (SCVWD) monitors groundwater quality and supports groundwater clean-up efforts.

Existing City regulations that reduce or avoid impacts with hazards and hazardous materials include the following:

- City of San José Hazardous Materials Release Response Plans and Inventory
- City of San José Hazardous Materials Storage Ordinance and Toxic Gas Ordinance
- City of San José Building and Fire Codes
- City of San José Municipal Code (Chapters 6.14, 17.12, 17.88, and 20.80)

3.9.4.1 Federal

U.S. Environmental Protection Agency. The EPA is the federal agency responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. The legislation includes the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (commonly referred to as “Superfund”), the Superfund Amendments and Reauthorization Acts of 1986, and the Resource Conservation and Recovery Act of 1986. The EPA provides oversight and supervision for site investigations and remediation projects, and has developed land disposal restrictions and treatment standards for the disposal of certain hazardous wastes.

3.9.4.2 State

California Environmental Protection Agency. Cal/EPA serves as the umbrella agency for the DTSC, the Office of Environmental Health Hazard Assessment (OEHHA), and the SWRCB and its associated regional Water Boards.

Department of Toxic Substances Control. The DTSC regulates remediation of sites where discharges to land could potentially present a public health risk. California legislation, for which the DTSC has primary enforcement authority, includes the Hazardous Waste Control Act and the Hazardous Substance Account Act. The DTSC generally acts as the lead agency for soil and groundwater cleanup projects, and establishes cleanup and action levels for subsurface contamination that are equal to, or more restrictive than, federal levels.

Office of Environmental Health Hazard Assessment. The mission of the OEHHA is to protect and enhance public health and the environment by objective scientific evaluation of risks posed by hazardous substances.

State Water Resources Control Board. The SWRCB, through its nine regional boards, regulates discharge of potentially hazardous materials to waterways and aquifers and administers basin plans for groundwater resources in various regions of the State. The San Francisco Bay RWQCB is the regional board that has jurisdiction over the project area. The SWRCB provides oversight for sites at which the quality of groundwater or surface waters is threatened and has the authority to require investigations and remedial actions.

Regional Water Quality Control Board. San Francisco Bay RWQCB regulates discharges and releases to surface and groundwater in the project area. The RWQCB generally oversees cases involving groundwater contamination. Within the San Francisco Bay RWQCB, the County of San Mateo Health Services Agency (CSMHSA) handles most leaking underground storage tank (LUST) cases, so the RWQCB may oversee cases involving other groundwater contaminants (i.e., spills, leaks, incidents, and clean-up cases). In the case of spills at a project site, the responsible party would notify the CSMHSA, and then a lead regulator (either the CSMHSA, RWQCB or DTSC) would be determined.

3.9.4.3 Local

Envision San José 2040 General Plan

The Envision San José 2040 General Plan includes policies applicable to all development projects in San José. The following are applicable to the proposed project:

Policy EC-7.1: For development and redevelopment projects, require evaluation of the proposed site's historical and present uses to determine if any potential environmental conditions exist that could adversely impact the community or environment.

Policy EC-7.2: Identify existing soil, soil vapor, groundwater, and indoor air contamination and mitigation for identified human health and environmental hazards to future users and provide as part of the environmental review process for all development and redevelopment projects. Mitigation measures for soil, soil vapor, and groundwater contamination shall be designed to avoid adverse human health or environmental risk, in conformance with regional, State, and Federal laws, regulations, guidelines, and standards.

Policy EC-7.3: Where a property is located in near proximity of known groundwater contamination with volatile organic compounds or within 1,000 feet of an active or inactive landfill, evaluate and mitigate the potential for indoor air intrusion of hazardous compounds to the satisfaction of the City's Environmental Compliance Officer and appropriate regional, state and federal agencies prior to approval of a development or redevelopment project.

Policy EC-7.4: On redevelopment sites, determine the presence of hazardous building materials during the environmental review process or prior to project approval. Mitigation and remediation of hazardous building materials, such as lead-paint and asbestos-containing materials, shall be implemented in accordance with state and federal laws and regulations.

Policy EC-7.5: On development and redevelopment sites, require all sources of imported fill to have adequate documentation that it is clean and free of contamination and/or acceptable for the proposed

land use considering appropriate environmental screening levels for contaminants. Disposal of groundwater from excavations on construction sites shall comply with local, regional, and state requirements.

Alviso Master Plan

The Alviso Master Plan includes policies applicable to all development projects within the plan area. The following policies are specific to hazardous materials and are applicable to the proposed project.

- *Industrial/Non-Industrial Relationships Policy 1:* Industrial uses are not allowed to store, handle, dispose, and/or use acutely hazardous materials within one-quarter mile of residential uses, George Mayne School, New Chicago Marsh (I.e., National Wildlife Refuge) and other sensitive uses and habitats.
- *Industrial/Non-Industrial Relationships Policy 1:* The Light Industrial areas located north of State Street and adjacent to Coyote Creek should mitigate potential negative environmental impacts to nearby natural resources.

3.9.5 Environmental Impacts and Mitigation Measures

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact With Mitigation. During the demolition, excavation and construction phase of the project, heavy equipment will be used for grading, excavation, ground improvement, and construction. The equipment will require minimal onsite fueling and limited maintenance, which could potentially result in spills of petroleum products or hazardous materials in construction staging areas. However, the likelihood of incidental spills would be minor: storage of any hazardous materials onsite during construction will be on appropriately sized secondary containment; fueling will occur over secondary containment; and most maintenance activities will occur at an offsite location. The project will also implement applicable best management practices (BMPs) included in a National Pollutant Discharge Elimination System-mandated Stormwater Pollution Prevention Plan (SWPPP) during construction to minimize this potential. Relevant BMPs would include designated fueling and maintenance areas removed from drainages and supplied with temporary spill containment equipment, such as absorbent booms and pads, and petroleum waste disposal containers. Further discussion regarding the SWPPP is provided in Section 3.10, Hydrology and Water Quality. Other hazardous materials that may be used during construction include paints, adhesives, cleaners, solvents, welding gases, spent lead acid batteries, and used waste lubricants. Due to their age, the existing, vacant residences likely contain both asbestos and lead-based paint. Prior to demolition appropriate permits will be obtained in accordance with Bay Area Air Quality District (BAAQMD) regulations, and the buildings will be abated with waste disposed of appropriately.

The SJC02 project design does not require deep foundations. Onsite soil conditions require ground improvements in the form of densification techniques. The densification technique(s) involve the vertical/horizontal compaction of soils beneath the foundations to reduce the total settlement to acceptable levels. The intent of the ground improvement design would be to increase the density of the onsite soils and compressible clays by laterally displacing and/or densifying the existing in-place soils. Workers will be protected by the development and implementation of the Site Management/Health and Safety Plans in accordance with applicable laws and regulations.

As previously mentioned, any surface soil that will be removed from the site may be considered as a California Hazardous Waste due to elevated levels of total DDT or lead associated with past agricultural use of pesticides. Any soils removed from the project site would be sampled and tested to determine appropriate disposal options at an approved facility. Similarly, because of the known presence of pesticide constituents in surface soils, representatives of an appropriate local or state regulatory agency, such as Santa Clara County Department of Environmental Health (SCCDEH) Site Mitigation Program or DTSC, may require the removal of excess surficial soils or the implementation of institutional or engineering controls (or some combination of both). Consultation with either the SCCDEH or DTSC and participation in the appropriate cleanup program, as well as incorporation of

mitigation measure MM HAZ 1.1 and MM HAZ 1.2 would confirm that the site development occurs in a manner that is protective of human health and the environment and does not result in any significant impacts.

During the operational phase of the project, diesel fuel for use by the administrative generators and valve sealed lead acid batteries in the uninterruptable power supply will be used/stored onsite. The diesel fuel will be stored in double-walled belly tanks underneath each generator and will be used only for emergencies, testing and maintenance purposes. Testing and maintenance will be limited to no more than 50 hours of operation per generator annually. Therefore, deliveries of diesel fuel to refill the belly tanks will be infrequent. As a result, the project will not create a significant hazard to the public through the routine transport, use, or disposal of hazardous materials at the site and no reportable quantities of acutely or extremely hazardous materials will be transported, stored, or used at the site.

The valve-sealed lead acid batteries will be located in each data center building's electrical room. The batteries are maintenance-free and require no additional electrolyte. Once the batteries have reached their useful life, they are replaced, and the spent battery is returned for recycling. As a result, the project would not create a significant impact on the environment in this regard.

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less Than Significant Impact. The 224 natural gas generators will not include any onsite fuel storage. The onsite natural gas metering yard and onsite supply lines will include an emergency shutoff valves located in the metering yard. These emergency valves will communicate with the operational control facilities to allow the natural gas supply to be terminated at the metering yard in the event of an emergency. As a result of the engineered controls, there is a less than significant impact that an accidental release of natural will create a significant hazard to the public or environment.

The project will include a 1,250 and a 500-kW standby generators, with a diesel fuel storage capacity of 4,800 gallons and 2,000 gallons, respectively. The diesel generator storage tanks are double-walled and will be monitored electronically for leakages, which will significantly reduce any risk of an accidental release. Furthermore, in the highly unlikely event of an accidental release of diesel fuel, the storage tanks' electronic monitoring system would trigger an alarm in the SJC02 security office alerting personnel of a detected leak resulting in a response to control any accidental releases as quickly as possible.

Diesel fuel delivery will occur on an infrequent, as-needed basis via a tanker truck. Diesel delivery trucks will follow standard spill prevention practices, such as using wheel chocks to secure the truck in a stationary position until disconnection of the transfer lines is complete. If a pump hose should break during fueling, an emergency pump shut-off will be activated. In addition, catch basins located at each generator's fill port will be closed during fueling events to prevent the escape of any small spills. As a result of the engineered controls, there is a less than significant impact that an accidental release of diesel fuel will create a significant hazard to the public or environment.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. The nearest school is the Anthony Spangler Elementary School in Milpitas, California that is located approximately 0.75 mile to the east of the SJC02 project site. There are no schools within a 0.25-mile radius of the SJC02 project site. Therefore, there will be no hazardous materials emitted from the site capable of creating offsite impacts at a nearby existing or proposed school, and there will be no impact.

d) Would the project be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less than Significant Impact. The project site and immediately adjacent properties are not on the State of California Hazardous Waste and Substances Site List (also known as the Cortese List). The project is not currently subject to institutional or engineering controls or AULs; however, the project site has recognized environmental conditions related to past use of pesticides for agricultural purposes. It is expected that development and construction of the site will undergo either consultation and approval under the Site Cleanup Program with SCCDEH or DTSC consultation under the Voluntary Cleanup Program prior to commencement of construction to ensure public health and the environment are protected. Therefore, the construction and operation of the SJC02 project is not expected to create a significant hazard to the public or the environment.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No Impact. The project site is located approximately 3.3 miles north-northeast of the Norman Y. Mineta San José International Airport and is more than 5.8 miles east of the Moffat Federal Airfield. The project site is located outside of any designated airport safety zones or airport noise contours (SCCALUC 2016) for the Norman Y. Mineta San José International Airport. Therefore, the project would have no impact as a result in a safety hazard or result in excessive noise impacts for people residing or working in the project area.

f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. As described in Section 3.15, Public Services, the City of San José Fire Department will serve the project site. The project does not include any changes to the existing public roadways that provide emergency access to the site. Therefore, the project would not impair the implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan and no impact would occur.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

No Impact. As described in Section 3.20, Wildfire, while the site is currently fallow farmland, it is surrounded by industrial facilities to the east, Highway 237 to the south, and WWTP sludge drying fields to the north. To the east is the City of Milpitas and commercial facilities. Neither Milpitas nor the City of San José is identified to be within a State of California Fire Hazard Severity Zone (Cal Fire 2019) at the wildland and urban interface. As a result and as further explained in Section 3.20, Wildfire, there will be no risk of exposing people or structures to a significant risk of loss, injury or death involving wildland fires.

Previously Identified Mitigation Measures Incorporated into the Project Design:

MM HAZ-1.1 A Site Management Plan (SMP) shall be prepared and implemented and any contaminated soils found in concentrations above established thresholds shall be removed and disposed of according to California Hazardous Waste Regulations or the contaminated portions of the site shall be capped beneath the planned development under the regulatory oversight of the Santa Clara County Hazardous Materials Compliance Division (HMCD) or the California Department of Toxic Substances Control (DTSC). The contaminated soil removed from the site shall be hauled off-site and disposed of at a licensed hazardous materials disposal site.

Components of the SMP shall include, but shall not be limited to:

- A detailed discussion of the site background;
- Preparation of a Health and Safety Plan by an industrial hygienist;
- Notification procedures if previously undiscovered significantly impacted soil or free fuel product is encountered during construction;

- Onsite soil reuse guidelines based on the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region's reuse policy;
- Sampling and laboratory analyses of excess soil requiring disposal at an appropriate off-site waste disposal facility;
- Soil stockpiling protocols; and
- Protocols to manage groundwater that may be encountered during trenching and/or subsurface excavation activities.

MM HAZ-1.2 All contractors and subcontractors at the project site shall develop a Health and Safety Plan (HSP) specific to their scope of work and based upon the known environmental conditions for the site. The HSP shall be approved by the PBCE Supervising Environmental Planner and Environmental Services Department (ESD) and implemented under the direction of a Site Safety and Health Officer. The HSP shall include, but shall not be limited to, the following elements, as applicable:

- Provisions for personal protection and monitoring exposure to construction workers;
- Procedures to be undertaken in the event that contamination is identified above action levels or previously unknown contamination is discovered;
- Procedures for the safe storage, stockpiling, and disposal of contaminated soils;
- Provisions for the onsite management and/or treatment of contaminated groundwater during extraction or dewatering activities; and
- Emergency procedures and responsible personnel.

The SMP shall be submitted to HMCD, DTSC, or equivalent regulatory agency for review and approval. Copies of the approved SMP shall be provided to the PBCE Supervising Environmental Planner and Environmental Services Department (ESD) prior to issuance of grading permits.

New Proposed Mitigation Measures: None

3.9.6 References

Cal Fire. 2019. *Cal Fire Santa Clara County Very High Fire Hazard Severity Zones in Local Responsibility Area*. Accessed May 28, 2019. http://www.fire.ca.gov/fire_prevention/fhsz_maps_santaclara.

California Department of Toxic Substances Control (DTSC). 2019. *Hazard Waste and Substances Site List - Site Cleanup (Cortese List)*. Accessed May 28, 2019. https://calepa.ca.gov/sitecleanup/corteselist/.

Cardno ATC (Cardno). 2015a. *Phase 1 Environmental Site Assessment of Agricultural Land Adjacent to 800 Thomas Foon Way, San José, California 95134*. Prepared for Calpine Corporation. March 20.

Cardno ATC (Cardno). 2015b. *Shallow Soil Assessment Report, Agricultural land Adjacent to 800 Thomas Foon Chew Way, San José, California 95134*. Prepared for Calpine Corporation. June 19.

City of San José (City). 2017a. *Draft Environmental Impact Report, 237 Industrial Center Project.* City of San José, California. June.

City of San José. 2017b. *Ordinance No. 30023 for Rezoning Certain Real Property of Approximately 64.59 acres situated Northwest of State Route 237 and McCarthy Boulevard (1657 Alviso-Milpitas Road) from the A(PD) Planned Development Zoning District to the LI Light Industrial Zoning District.* Original date October 24, 2017. Adopted December 12, 2017.

Cornerstone Earth Group (Cornerstone). *2015. Phase I Environmental Site Assessment, 1595 and 1657 Alviso-Milpitas Road, San José, California*. October.

Cornerstone Earth Group (Cornerstone). 2016. *Phase I Environmental Site Assessment Update, 1595 and 1657 Alviso-Milpitas Road, San José, California*. April.

Earth Sciences Associates (ES). 1991. Preliminary Site Assessment, Cilker Property. Prepared for Santa Clara Valley Water District. June 21.

San Francisco Bay Regional Water Quality Control Board (San Francisco Bay RWQCB). 1995. San Francisco Bay Region File No. 2188.20 (JRW). *Letter transmitting Remedial Action Completion Certificate and Case Closure Summary for Pesticide and Herbicide Release at the Former Cilker Property, 1595 Milpitas-Alviso Road, San José, California, Santa Clara County, California.* December 12.

Santa Clara Valley Water District. 1998. Fuel Leak Site Case Closure letter for Cilker Orchards No. 3, 1595 Milpitas-Alviso Road, San José, California 95134. Leaking Underground Storage Tank Oversight Program. August 19.

Santa Clara County Airport Land Use Commission (SCCALUC). 2016. *Mineta San José International Airport Comprehensive Land Use Plan for Santa Clara County*. Accessed May 28, 2019. https://www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_SJC_CLUP.pdf.

Attachment DR-76
Safety Data Sheet for Diesel Exhaust Fluid

BlueDEF Diesel Exhaust Fluid

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date: 04/21/2017

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Product name : BlueDEF Diesel Exhaust Fluid

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Solution for NOx reduction in SCR systems

1.3. Details of the supplier of the safety data sheet

Old World Industries, LLC
4065 Commercial Ave.
Northbrook, IL 60062 - USA
T (847) 559-2000
www.oldworldind.com

1.4. Emergency telephone number

Emergency number : (800) 424-9300; (703) 527 3887 (International)
Chemtrec

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified

2.2. Label elements

GHS-US labelling

Signal word (GHS-US) : None

Hazard statements (GHS-US) : None

Precautionary statements (GHS-US) : None

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	% by wt	GHS-US classification
water	(CAS-No.) 7732-18-5	67.5	Not classified
urea	(CAS-No.) 57-13-6	32.5	Not classified

Full text of hazard classes and H-statements : see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Assure fresh air breathing. Allow the victim to rest.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects : Not expected to present a significant hazard under anticipated conditions of normal use.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

No additional information available

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : The EPA has no established reportable quantity for spills for this material, secondary containment is not specified.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials. For minor spillages wash down with excess of water. Mop up small spills.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Direct sunlight, Heat sources. Keep container closed when not in use.

Incompatible products : Strong bases. Strong acids.

Incompatible materials : Sources of ignition. Direct sunlight.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

No additional information available

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Avoid all unnecessary exposure. Gloves. Protective goggles.

Hand protection:

Wear protective gloves

Eye protection:

Chemical goggles or safety glasses

Respiratory protection:

Wear appropriate mask

Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Color	:	Colorless
Odor	:	characteristic ammonia odor
Odor threshold	:	No data available
pH	:	9 - 10
Relative evaporation rate (butylacetate=1)	:	< 1
Freezing point	:	-11 °C (12 ºF)
Boiling point	:	> 100 °C (212 ºF)
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	Not Applicable
Relative vapor density at 20 °C	:	0.6 H2O, >1
Specific Gravity	:	1.09
Solubility	:	Soluble in water. Water: 100 %
Log Pow	:	No data available
Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

No additional information available

10.5. Incompatible materials

Strong acids. Strong bases. oxidizing agents (peroxides, chromates, dichromates).

10.6. Hazardous decomposition products

Carbon monoxide. Carbon dioxide. Fume.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

urea (57-13-6)	
LD50 oral rat	8,471.00 mg/kg (Rat; OECD 401: Acute Oral Toxicity; Literature study; 14300 mg/kg bodyweight; Rat; Experimental value)
LD50 dermal rat	> 3,200.00 mg/kg (Rat; Literature study)
LD50 dermal rabbit	> 21,000.00 mg/kg (Rabbit; Literature study)
ATE US (oral)	8,471.00 mg/kg bodyweight

Skin corrosion/irritation : Not classified
pH: 9 - 10

Serious eye damage/irritation : Not classified
pH: 9 - 10

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

urea (57-13-6)	
LC50 fish 1	> 6,810.00 mg/l (LC50; 96 h; Leuciscus idus; Static system)
EC50 Daphnia 1	> 10,000.00 mg/l (EC50; 48 h; Daphnia magna)
Threshold limit algae 1	> 10000 mg/l (EC0; 168 h; Scenedesmus quadricauda; Static system; Fresh water)

12.2. Persistence and degradability

urea (57-13-6)	
Persistence and degradability	Inherently biodegradable. Hydrolysis in water. Highly mobile in soil.
ThOD	0.27 g O_2/g substance

12.3. Bioaccumulative potential

urea (57-13-6)	
BCF fish 1	1.00 (BCF; 72 h; Brachydanio rerio)
BCF other aquatic organisms 1	11,700.00 (BCF)
Log Pow	< -1.73 (Experimental value; EU Method A.8: Partition Coefficient)
Bioaccumulative potential	Bioaccumulation: not applicable.

12.4. Mobility in soil

urea (57-13-6)	
Mobility in soil	Not applicable
Log Koc	Koc,0.037-0.064; Experimental value

12.5. Other adverse effects

Effect on ozone layer : No additional information available

Effect on global warming : No known effects from this product.
No additional information available

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : As a non-hazardous liquid waste, it should be solidified with stabilizing agents such as sand, fly ash, or clay absorbent, so that no free liquid remains before disposal to an industrial waste landfill.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Not regulated

Transportation of Dangerous Goods

Refer to current TDG Canada for further Canadian regulations

ADR

Not regulated

Transport by sea

Not regulated

Air transport

Not regulated

SECTION 15: Regulatory information

15.1. US Federal regulations

BlueDEF Diesel Exhaust Fluid	
EPA TSCA Regulatory Flag	Toxic Substances Control Act (TSCA): The intentional ingredients of this product are listed
CERCLA RQ	None. This material is not classified as hazardous under U.S. EPA regulations.
SARA Section 302 Threshold Planning Quantity (TPQ)	No extremely hazardous substances are in this product.
SARA Section 311/312 Hazard Classes	Urea. No hazards resulting from the material as supplied.

urea (57-13-6)	
EPA TSCA Regulatory Flag	Toxic Substances Control Act (TSCA): The intentional ingredients of this product are listed
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

BlueDEF Diesel Exhaust Fluid	
WHMIS Classification	This SDS has been prepared according to the criteria of the Hazardous Products Regulations (HPR) (WHMIS 2015) and the SDS contains all of the information required by the HPR. Applicable GHS information is listed in section 2.2 of this SDS.

EU-Regulations

No additional information available

National regulations

BlueDEF Diesel Exhaust Fluid
DSL (Canada): The intentional ingredients of this product are listed

urea (57-13-6)
DSL (Canada): The intentional ingredients of this product are listed EINECS (Europe): The intentional ingredients of this product are listed

15.3. US State regulations

California Proposition 65 - This product does not contain any substance(s) known to the state of California to cause cancer, developmental toxicity and/or reproductive toxicity

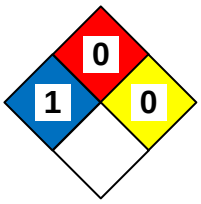
SECTION 16: Other information

Revision date : 04/21/2017

NFPA health hazard : 1 - Materials that, under emergency conditions, can cause significant irritation.

NFPA fire hazard : 0 - Materials that will not burn under typical dire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Personal protection B - Safety glasses, Gloves

SDS GHS US (GHS HazCom 2012) OWI

Old World Industries, LLC makes no warranty, representation or guarantee as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of this product. Since actual use by others is beyond our control, no warranty, expressed or implied, is made by Old World Industries, LLC as to the effects of such use, the results to be obtained or the safety and toxicity of this product, nor does Old World Industries, LLC assume liability arising out of the use by others of this product referred to herein. The data in this SDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

PEAK
COMMERCIAL & INDUSTRIAL

BlueDEF™

DIESEL EXHAUST FLUID

APPROVED FOR USE IN ALL DIESEL SCR SYSTEMS

WHAT IS BLUEDEF®?

BlueDEF® is a mixture of 32.5% high purity synthetic urea and 67.5% deionized water that is used in Selective Catalytic Reduction(SCR) systems on diesel engines. DEF is the primary ingredient used to help convert NOx to harmless nitrogen and water. BlueDEF is stable, colorless, non-flammable, non-toxic and is classified as minimum risk for transportation. BlueDEF conforms to the ISO-22241-1 specification for DEF, is API registered and meets or exceeds OEM specifications.

BLUEDEF HANDLING AND STORAGE

The shelf life of DEF is directly related to the temperature at which it is stored. Storage temperature between 12º and 86º F are recommended to maintain optimal shelf life of up to two years. If BlueDEF freezes, its efficacy will not be effected upon thawing. To maintain the purity of DEF and not harm the SCR Catalyst System care must be taken regarding the material of construction for all items that come in contact with the DEF solution. Included from the ISO-22241-1 standards are the recommended and not recommended materials for contact with DEF.

PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point	>212° F
Crystallization Point	12° F
Pounds/Gallons	9.09
Specific Gravity (Water=1)	1.09
Vapor Pressure (mm of Hg)	Not applicable
Vapor Density (Air=1)	0.6 H_2O >1
Water Solubility	100%
Appearance	Colorless, clear liquid
Odor	None to slight ammonia
Evaporation Rate	<1

MATERIALS RECOMMENDED FOR USE WITH DEF

Highly alloyed austenitic Cr-Ni-Mo-steels or stainless steel 304 (S30400), 304L (S30403), 316 (S31600) AND 316L (S31603) in accordance with ASTM A240, ASTM A276, and ASTM A312

Titanium

Ni-Mo-Cr-Mn-Cu-Si-Fe Alloys, e.g. Hastelloy c/c-276

Polypropylene, free of additives

Polyethylene, free of additives

Perfluoroalkoxyl Alkane (PFA), free of additives

Polyfluroroethylene (PFE), free of additives

Polyvinylidenefluoride (PVDF), free of additives

Polytetrafluoroethylene (PTFE), free of additives

Copolymers of Vinylidenefluoride and Hexafluoropropylene, free of additives

MATERIALS NOT RECOMMENDED FOR USE WITH DEF

Carbon Steels, Zinc Coated Carbon Steels, and Mild Iron

Non ferrous metals and alloys: Copper, Copper Alloys, Zinc, Lead

Solders containing Lead, Silver, Zinc or Copper

Aluminum, Aluminum Alloys

Magnesium, Magnesium Alloys

Plastics or metals coated with Nickel

PACKAGING OPTIONS

1 Gallon
Part# DEF003

2.5 Gallon
Part# DEF002

55 Gallon Drum
Part# DEF001 (Plastic Valve)
Part# DEF001S (Stainless Steel Valve)

275 Gallon Tote
Part# DEF275P (Plastic Valve)
Part# DEF275S (Stainless Steel Valve)

330 Gallon Tote
Part# DEF330P (Plastic Valve)
Part# DEF330S (Stainless Steel Valve)

	1 Gallon	2.5 Gallon	55 Gallon Drum	275 Gallon Tote	330 Gallon Tote
UPC Code	0-74804-02567-5	0-74804-03211-6	0-74804-03522-3	0-74804-03308-3	0-74804-03309-0
Case UPC Code	0-74804-12567-2				
Case SCC-14 Code	100-74804-02567-2	1-00-74804-03211-3			
Pack/Unit Case	4 per case	1 per case			
Weight/Case	37 lbs.	22.75 lbs.	522.5 lbs. (per drum)	2,581 lbs. (per tote)	3,086 lbs. (per tote)
Case Dimensions	8.5"l x 15"w x 12.25"h	9.5"l x 9.5"w x 10"h	22.5" dia. x 35.5" high	48"l x 40"w x 46"h	48"l x 40"w x 53"h
Cases Per Pallet	48	80	4 (drums)	1 (tote)	1 (tote)
Pallets/Cases Per Truck	22 / 1,056	22 / 1,760	20	16	14
Units Per Truck	4,224	1,760	80	16	14
Truckload Weight*	40,172 lbs.	41,140 lbs.	42,800 lbs.	41,296 lbs.	43,204 lbs.
Pallet Size	48"l x 40"w x 53.75"h	48"l x 40"w x 44.75"h	48"l x 40"w x 40.25"h	48"l x 40"w x 46"h	48"l x 40"w x 53"h
Pallet Weight*	1,826 lbs.	1,870 lbs.	2,140 lbs.	2,581 lbs.	3,086 lbs.
Cases/Rows High	12/4	20/4			

includes product and pallet weight (50 lbs. each)

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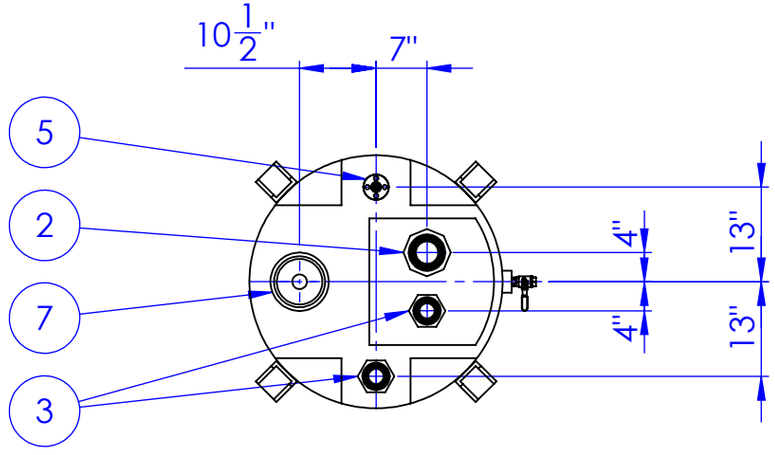
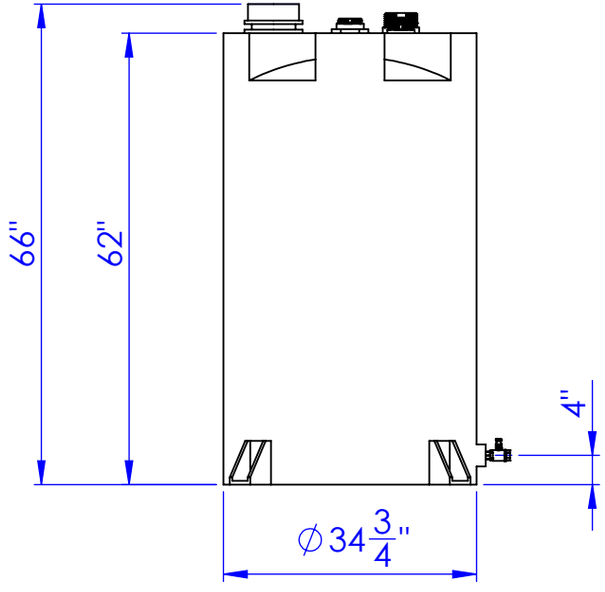
API AMERICAN PETROLEUM INSTITUTE CERTIFIED DIESEL EXHAUST FLUID
DEF ISO 22241

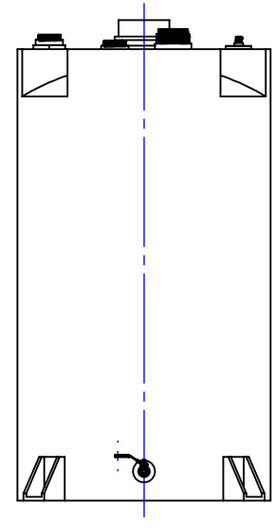
CHEMISTRY THAT DRIVES COMMERCE™

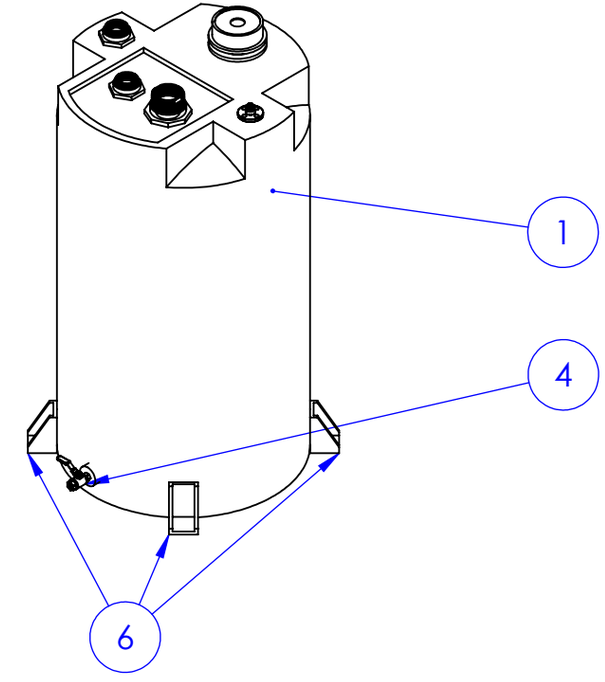
Attachment DR-79
Schematics for the Diesel Exhaust Fluid Storage Tanks



ITEM NO.	DESCRIPTION	QTY.	NOTES
1	DMT-135 TANK	1	
2	3" FNTP PP TANK FITTING	1	VENT
3	2" FNTP PP TANK FITTING	2	UREA FILL/LEVEL SENSOR
4	1/2" SS-316 BALL VALVE W/ 2" TO 1/2" REDUCER AND FLANGE ADAPTER FITTING	1	OUTFLOW
5	1/2" SS-316 BOLTED KONTEK FITTING	1	
6	SUPPORT LEGS	4	
7	6" THREADED LID	1	





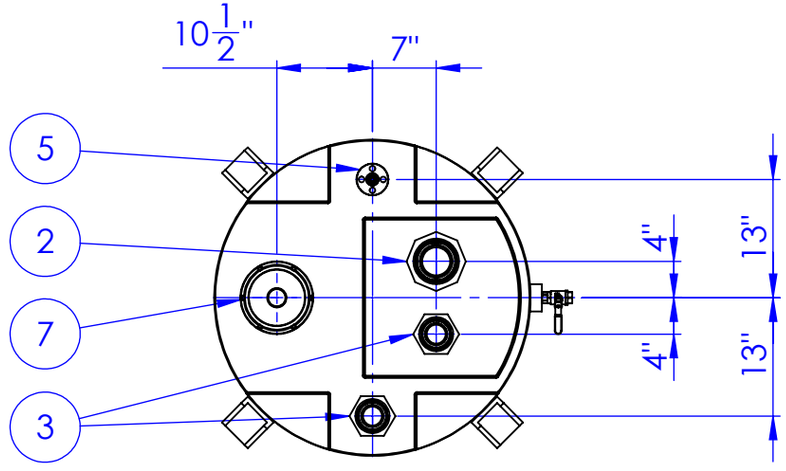


NOTES:

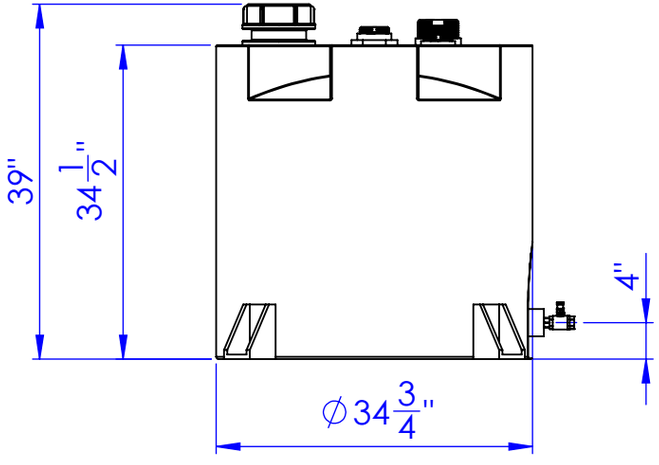
- 12" OF CLEARANCE MUST BE GIVEN TO TOP SURFACE AND 2" ON SIDES. IF INSULATION IS USED, PROVIDE AN ADDITIONAL 2" OF CLEARANCE TO ALL SURFACES
- TANK IS MANUFACTURED FROM HDPE
- TANK IS MANUFACTURED TO ASTM-D-1998 STANDARD
- ALL TANK DIMENSIONS ARE SUBJECT TO A +/-3% TOLERANCE

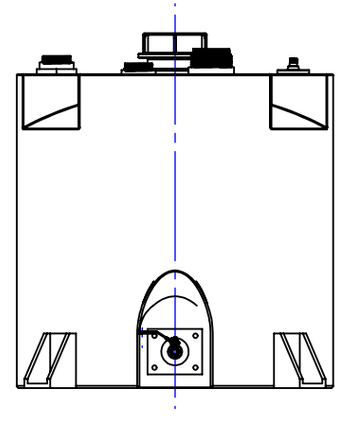
FILE NAME: 06005001 DMT-135 Urea Tank Rev1.0

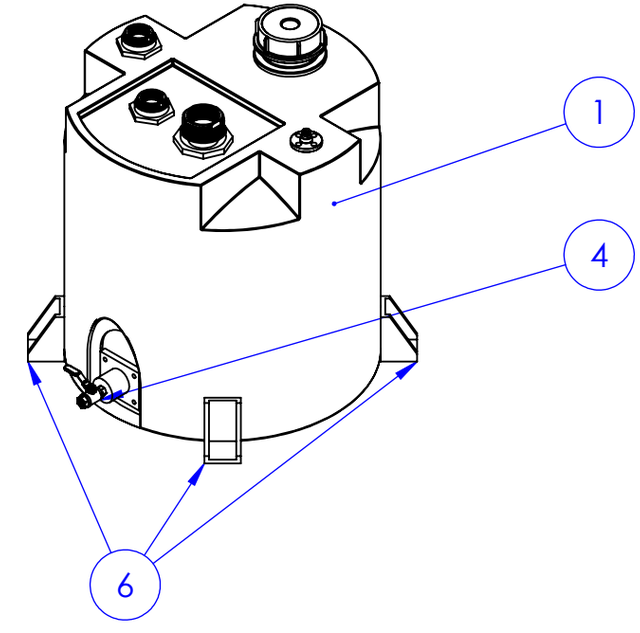
REVISION			CUSTOMER:		PROPRIETARY INFORMATION OF SAFETY POWER INC: Not to be reproduced, copied or disseminated without the express prior written consent of Safety Power Inc.	SCALE: NTS
REV	DESCRIPTION	APVD/DATE				
1.0	INITIAL RELEASE	27 MAY 2019	DATE: 27 MAY 2019	TITLE: UREA TANK (162 US GALLONS)	CONFIDENTIAL PROPERTY OF SAFETY POWER INC.	PROJECT NO.
			DRAWING NUMBER:			ENGINEER: ED
						PLANT:



ITEM NO.	DESCRIPTION	QTY.	NOTES
1	TACPDC0084 TANK	1	
2	3" FNTP PP TANK FITTING	1	VENT
3	2" FNTP PP TANK FITTING	2	UREA FILL/LEVEL SENSOR
4	1/2" SS-316 BALL VALVE W/ 2" TO 1/2" REDUCER AND FLANGE ADAPTER FITTING	1	OUTFLOW
5	1/2" SS-316 BOLTED KONTEK FITTING	1	
6	SUPPORT LEGS	4	
7	6" THREADED LID	1	







NOTES:

- 12" OF CLEARANCE MUST BE GIVEN TO TOP SURFACE AND 2" ON SIDES. IF INSULATION IS USED, PROVIDE AN ADDITIONAL 2" OF CLEARANCE TO ALL SURFACES
- TANK IS MANUFACTURED FROM HDPE
- TANK IS MANUFACTURED TO ASTM-D-1998 STANDARD
- ALL TANK DIMENSIONS ARE SUBJECT TO A +/-3% TOLERANCE

FILE NAME: 06005001 TACPDC0084 Urea Tank Rev1.0

REVISION			CUSTOMER:		PROPRIETARY INFORMATION OF SAFETY POWER INC: Not to be reproduced, copied or disseminated without the express prior written consent of Safety Power Inc.	SCALE: NTS
REV	DESCRIPTION	APVD/DATE			CONFIDENTIAL PROPERTY OF	PROJECT NO.
1.0	INITIAL RELEASE	27 MAY 2019	DATE: 27 MAY 2019	TITLE: UREA TANK (84 US GALLONS)	SAFETY POWER INC.	ENGINEER: ED
			DRAWING NUMBER:			PLANT:

Attachment DR-85
Revised Section 2.0 Project Description of the SJC Small Power Plant Exemption Application

2. Project Description

Microsoft Corporation (Applicant) proposes to construct and operate the San José City Data Center (SJC02) located at 1657 Alviso-Milpitas Road in San José, California. The SJC02 will consist of two single-story data center buildings. The maximum electrical load of the project will be 99 megawatts (MW), although the estimated load is 92 77 MW, inclusive of information technology (IT) equipment, ancillary electrical/telecommunications equipment, and other electrical loads (administrative, heat rejection, and safety/security). For the purposes of the CEC and City of San José's environmental review process, this SPPE application also describes the removal remediation of of existing onsite buildings and contaminated soils[1] from at the site. To provide reliable operation of the pProject in the event of loss of electrical service from the local electric utility provider, Pacific Gas & Electric Company (PG&E), the pProject includes 40 224 30.045-MW renewable natural gas (natural gas) standby diesel generators to provide electrical power to support the data center uses IT load during utility outages, or certain onsite electrical equipment interruption or failure, and to participate in PG&E's Resource Adequacy (RA) market and for load shedding, demand response and behind--the--meter resource adequacy (RA) ancillary services. These generators will be deployed in redundant configurations (that is, all 40 224 generators will never be operating at the same time at 100 percent) to provide uninterrupted power, up to the maximum of 99 MW (with an expected load of 92 MW). Electrical power from the SJC02 backup generators cannot and will not create electricity for offsite distribution and consumption, as the electrical interconnection to the PG&E system only supports supplying electricity to the SJC02 and does not allow exporting electricity from the project back to PG&E (i.e., the distribution line only allows power to flow in one direction – from PG&E to SJC02). In addition to the 40 224 backup generators, the SJC02 will include two administrative Tier IV diesel-powered generators, rated at 1.25 MW and 0.5 MW, to support administrative functions during an interruption in the normal delivery of electrical power from the utility. The Applicant will stipulate in an agreement with the utility to a contractual limit in the amount of electricity available from PG&E's system to a maximum of 99 MW.

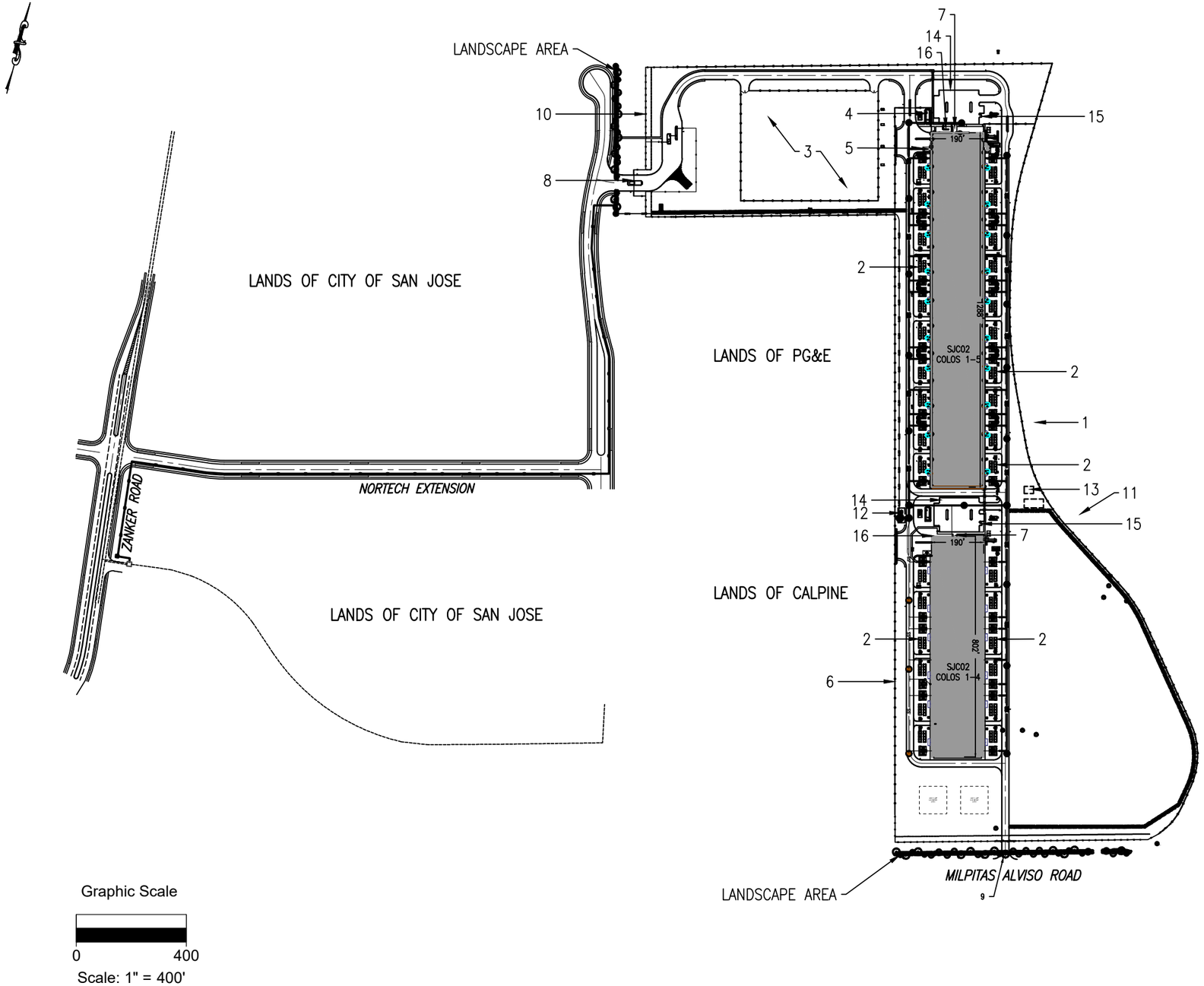
2.1 Project Overview

The SJC02 consists of two buildings with approximately 479396 7,914000 gross square feet of administrative and data center space. The northern building (designated SJC02) is a single-story structure of approximately 241244,705 676 gross square feet consisting of 5 colocation units (colos) with supporting amenities. The southern building (designated SJC03) is a single-story structure of approximately 237,268152,238 square feet consisting of 3 colos with supporting amenities. Both buildings include13,826 square feet administrative spaceareas, including restrooms and shower facilities, storage areas, and loading docks. The site includes, backup generator yards, stormwater bio-swales, paved surface parking lots, and landscaping features. SJC02 The site also includes an onsite 230115-kilovolt (kV) substation with two, underground 230115-kV electrical supply lines that will connect to PG&E's Los Esteros Substation, located adjacent to the site. The approximately 64.5-acre pProject site (Assessor's Parcel No. 015-31-054) is designated Light Industrial under the adopted Envision San José 2040 General Plan; is identified as Light Industrial in the applicable Alviso Master Plan; and is zoned LI- Light Industrial with an Assessor's Parcel Number of 015-31-054. Figure 1-1 shows the regional location of the SJC02 site, and Figure 1-2R identifies the project site location. A site plan is provided as Figure 2-1R.

The standby generation system for the project consists of 40 224 renewable 3.0-MW dieselnatural gas-fired generators, each with a standby output capacity of 30.0 45 MW to support the need for the data center uses to provide an uninterruptible power supply. The SJC Each building's administrative functions will be supported during electrical outages by a two standby generators (designated as Admin generators), with a 1.25-MW diesel-fired standby generator for the northern building and a 0.5-MW standby diesel-fired generator for the southern building. Additional project features include electrical switchgear and subsurface distribution lines between the substation and buildings, as well as from the backup generators yards and from each respective building. The backup generation system will be located in equipment yards along the sides of each building. Each The SJC02 building will include 21 141 standby generators (20 140 30.448-MW standby natural gas generators and an Admin standby

generator). SJC03 will include 85 standby generators (84 0.448-MW natural gas generators and an Admin standby generator). The natural gas generators are installed in groups of 7, with four groups of seven required for each colo. The Admin generator for each building will provide continuous power to the essential systems (fire monitoring and other emergency operations) for both buildings during electrical outages. At no time will the standby generators generate more than 99 MW[2] of electricity.

[2] Total power use assumes 2240, 30.448-MW standby natural gas generators operating at 75 percent load, plus the admin generators ((2240 * 3 0.448 MW * 0.75) + 1.25 MW + 0.5 MWs = 9177.75 0 MWs).



LEGEND:

PROPERTY LINE AND LIMIT OF DISTURBANCE

1. BIOSWALE
2. GENERATORS/UTILITY YARDS
3. SUBSTATION
4. GENERATOR PAD (TYP.)
5. REFUSE/RECYCLING CANOPY
6. PROPERTY LINE
7. ADA ENTRY
8. SITE ENTRANCE/EXIT
9. SECONDARY SITE ENTRANCE/EXIT
10. FENCED PERIMETER (8')
11. EXISTING STORMWATER EASEMENT
12. SANITARY PUMP STATION
13. CAR PARKING
14. MOTORCYCLE PARKING
15. BICYCLE PARKING

Figure 2-1R
Site Plan
San José Data Center (SJC02)
San José, California

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Each backup generator is a fully independent package system, with the two administrative generators having dedicated fuel tanks located on a skid below the generator, ~~located at ground level adjacent to the buildings~~. Each backup generator ~~ion yard~~ will be electrically interconnected to the building it serves through a combination of underground and aboveground conduit and cabling to a location within the building that houses electrical distribution equipment.

The project will include several offsite connections to potable and recycled water pipelines and to sanitary sewer and stormwater pipelines, and an access road from the northern project boundary to Zanker Road, referred to herein collectively as the "offsite infrastructure alignment areas," as shown on Figure 2-1R. ~~No natural gas will be used at the site.~~

2.1.1 Potable Water

For redundancy purposes, three potable water lines are proposed. Water Line Route #1 and Water Line Route #2 begin in the northwestern corner of the project. Both routes travel south to the proposed entrance road, Nortech Extension. From there, they both turn west to Zanker Road. At Zanker Road, Water Line Route #1 heads north briefly and then west, ultimately connecting to the Nortech valve. Water Line Route #1 is approximately 1.5 miles (7,900 feet) long. At Zanker Road, Water Line Route #2 turns south before turning west alongside Highway 237, and eventually turning south to go under Highway 237 to connect to the new Holger Valve. Water Line Route #2 is approximately 1.3 miles (7,100 feet) long. Water Line Route #3 begins at the southwestern corner of the project, and heads generally east to Zanker Road, where it will parallel Water Line Route #2 connecting to the new Holger valve. Water Line Route #3 is approximately 1.4 miles (7,500 feet long). The water will come from the San José Municipal Water System to the project.

2.1.2 Reclaimed Water

Reclaimed water will be used at the site for landscaping and cooling purposes. The reclaimed water line will start at the northwestern corner of the project site and proceed south to the proposed entrance road, Nortech Extension. From there, the line turns west and ends at an existing reclaimed water line that is oriented generally north to south. The reclaimed water line will be approximately 0.5 mile (2,900 feet) long).

2.1.3 Sanitary Sewer

A sanitary sewer line will begin at the northwestern corner of the project site, and head south to the proposed entrance road, where the line turns to the west. At Zanker Road, the line turns south and will connect to the existing sanitary sewer force main/pump station at the corner of Zanker Road and Thomas Foon Chew Way. The sewer line is approximately 0.6 mile (3,300 feet) long.

2.1.4 Stormwater

The stormwater line for the project will begin in the northwestern corner of the project site, paralleling the water line route, terminating at the Nortech Parkway extension off Zanker Road, where it will tie into the City of San José's stormwater system in the vicinity of Nortech Parkway. The stormwater line is approximately 0.55 miles (3,000 feet) long.

2.1.5 Electrical Supply Line

The proposed onsite substation will be located in the northwestern corner of the project site and will interconnect to the existing, adjacent PG&E substation via two, approximately 0.2-mile-long 115 kV distribution lines. The approximately 1,000-foot-long electrical supply lines will be located within the access road on the western fenceline of ~~the project site~~the PG&E Los Esteros substation, ~~adjacent to the Los Esteros Critical Energy Facility (LECEF)~~.

2.1.6 Natural Gas Supply Line

The project will include two separate natural gas supply lines at the southern border of the projectposed site, which uniquely provides redundancy in the natural gas supply. Each line will run directly south from the project boundary to PG&E's existing gas lines located within Ranch DriveAlvis-Milpitas Road. One natural gas supply line will interconnect with Line 109 and the other with Line 101. Each gas supply line will be approximately 75 feet in length.

2.1.62.1.7 Bike Trail Extension

The proposed project includes the extension of a Class I improved trail along the east side of Zanker Road from intersection of the existing bike trail at Zanker Road to the new Nortech Parkway extensionRanch Drive along the southern boundary of the site to the end of the existing bike trail (shown on Figure 3.16-2R of the Recreation section) in order to provide a trail connection to the Coyote Creek Trail.

2.1.72.1.8 Data Center Design

Buildings SJC02 and SJC03 will be constructed of steel structural components with metal-framed and insulated exterior walls with metal panel façade containing accent fields. The entries will include storefront glazing. Heating, ventilation, and air-conditioning equipment, including adiabatic chiller units, will be located adjacent to each building. Figures 2-2aR to 2-2bR provide the conceptual floor layout for the two buildings. Elevation drawings are presented on Figures 2-3aR through 2-3fR 3gR for Building SJC02 and 2-4aR through 2-4gR 4eR for Building SJC03. The exterior of the buildings will conform to applicable City of San José design standards. Figure 2-5R provides an oblique rendering of the project.

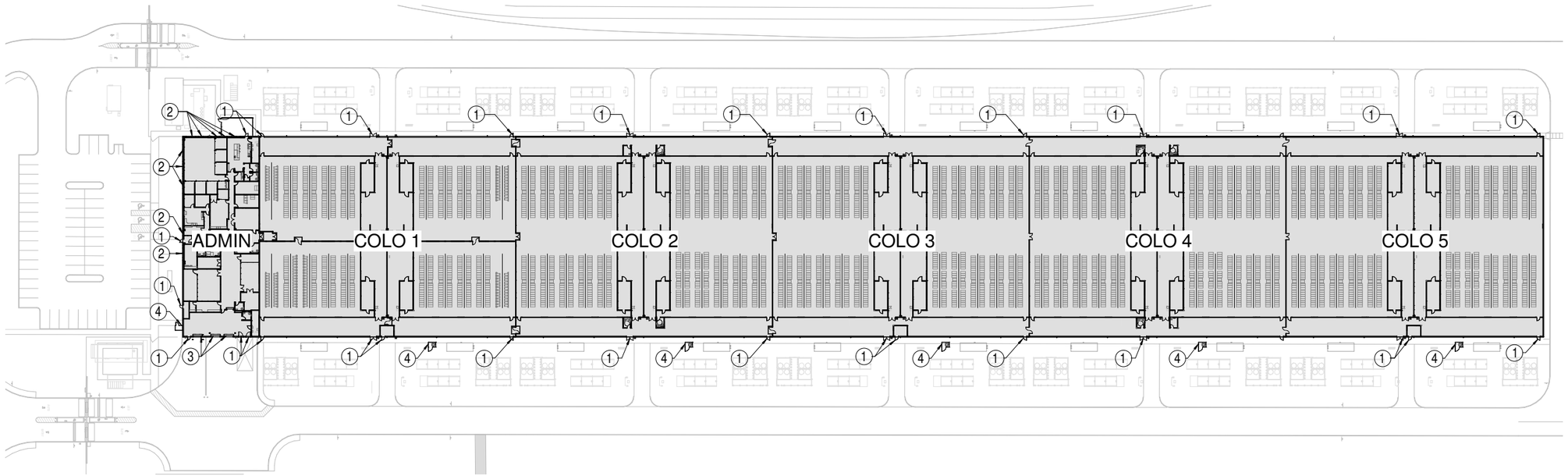
2.2 Electrical System Engineering

The natural gas standby generators system includes a redundant 4-to-make-3 design topology, meaning that for every threeonly 75 percent of a standby generator's capacity is required to s that would support the electrical load in the event of a utility failure, there is one redundant generator. In the event of a utility service disruption, this means that all 40 224 standby generators (total for both buildings) begin operation at approximately 75 percent load, with both Admin generators operating at approximately 100 percent load. The total estimated electrical demand under this scenario is approximately 92 77 MW. Each building's standby generators will be supported by an uninterruptible power supply (UPS) system consisting of batteries, an inverter, and switches to facilitate the uninterrupted transfer of electrical power supply from the PG&E substation to the onsite standby generators in the event of an undefined number of potential circumstancesevents that could impact PG&E's service (resulting in a loss of power or degradation in power quality), which triggers the starting of the standby generators. The UPS system includes valve-regulated battery banks, with each bank capable of providing up to 10 minutes of backup at 100 percent load. The UPS system has a rectifier and inverter to condition electricity and is sized to deliver power to support 100 percent of the server bay demand for up to 60 seconds. However, when the electrical service is outside of pre-determined tolerances (+10 or -15 percent of alternating current nominal voltages or a frequency range of 60 Hertz plus or minus 5 percent), the UPS will transfer over to bypass to deliver generator produced power. The UPS transfer load from PG&E to UPS battery power, which triggers the start of the generators, occurs within 5 milliseconds. Load then transfers from the UPS battery system to the standby generators within 20 seconds of generator start. The UPS system provides 'clean' utility power for critical loads (IT equipment, fire/security and building management systems, and some small 120-volt circuits). The major mechanical systems, lighting, and general receptacles are not powered from the UPS sources.

The two separate 230115-kV PG&E distribution lines are connected to PG&E's Los Esteros substation at two new, separate circuit breakers (Bays 7 and 8). The interconnection to the PG&E System and One Line Diagram is provided as Figure 2-6R. The SJC02 distribution lines will include 1,250 kcmil copper XLPE extruded dielectric cables capable of transmitting 150 Mega Volt Amps. a 715 double-bundle

~~Aluminum Conductor Composite Reinforced with a current carrying capacity of 310 Mega Volt-Amps .~~ ~~The receiving stations step voltage down to 60 kV for distribution along the Northwest Loop, which can then provide electricity to facilities interconnected to the loop from either end, making electrical service reliable.~~ PG&E has indicated that since 2007, there have been five outages of the 115 kV lines feeding the Los Esteros substation. Two events (each) in 2008 and 2010 and one event in 2014, with a collective outage duration of 18 hours and 20 minutes. Since 2010, the total duration of outages for these 115 kV lines ~~is~~has been less than 3 minutes.~~they have an outage frequency for the period of 2014 to 2018 of 99.8 and 99.9 percent on the two, 230 kV supply lines into the substation. Over this period, there have been 11 outages, with the longest outage in 2018 lasting for 72 hours.~~

A single electrical system consists of a 34.5-kV to 480-volt substation transformer feeding the 480-volt critical bus that feeds two parallel UPS modules. The critical bus is supported by its own standby generator, and each standby generator operates independent of one another. A utility main breaker and a generator main breaker are included in the critical bus 480-volt switchgear, which are controlled by an automatic transfer controller that transfers the electricity generated by the dedicated standby generator in the event of a power outage.



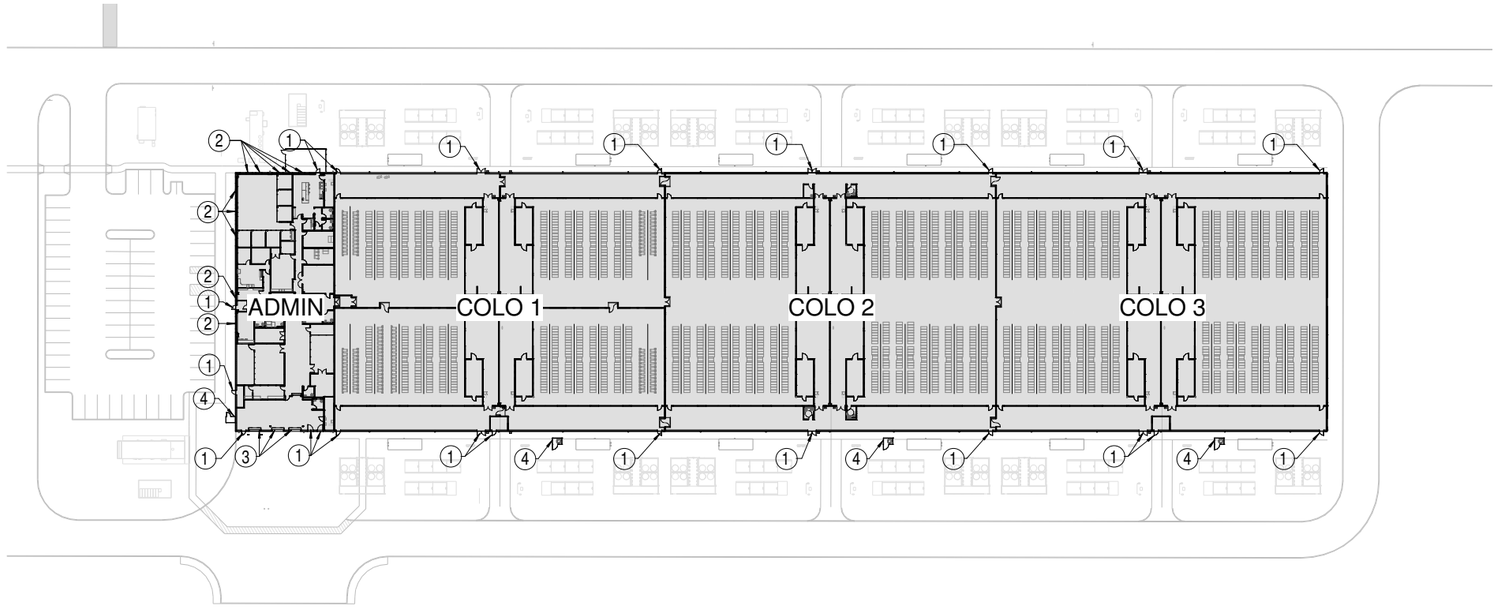
1 SJC02 - OVERALL GROUND FLOOR PLAN
1" = 50'-0"

① EXTERIOR DOOR LOCATION
② WINDOW LOCATION
③ OVERHEAD COILING DOORS
④ ROOF ACCESS LADDER

A	1	2	3	4	5

NORTH

Figure 2-2aR
Floor Plan North Building
San José Data Center (SJC02)
San José, California



1 SJC03 - OVERALL GROUND FLOOR PLAN
1" = 50'-0"

① EXTERIOR DOOR LOCATION
② WINDOW LOCATION
③ OVERHEAD COILING DOORS
④ ROOF ACCESS LADDER

A	1	2	3

NORTH

Figure 2-2bR
Floor Plan South Building
San José Data Center (SJC02)
San José, California

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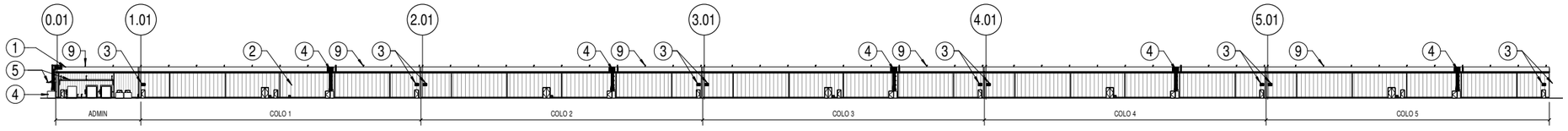
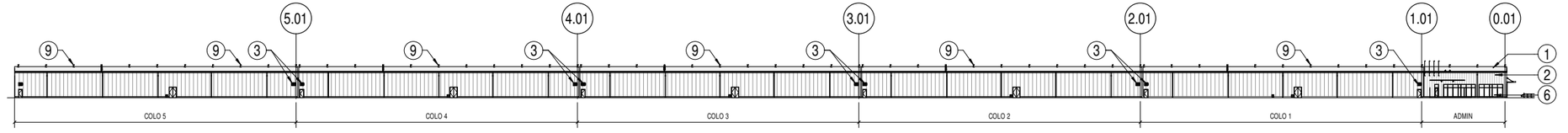
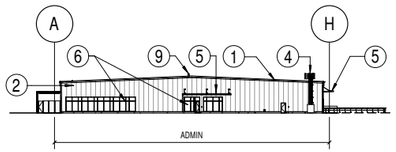


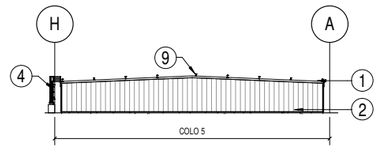
1 WEST ELEVATION - ADMIN, COLOS 1, 2, 3, 4 & 5
1" = 50'-0"



2 EAST ELEVATION - ADMIN, COLOS 1, 2, 3, 4 & 5
1" = 50'-0"



3 ELEVATION - ADMIN END WALL
1" = 50'-0"



4 ELEVATION - COLO 5 END WALL
1" = 50'-0"

① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO

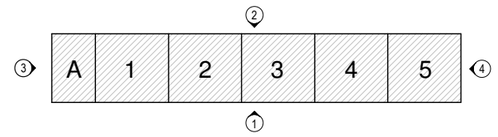
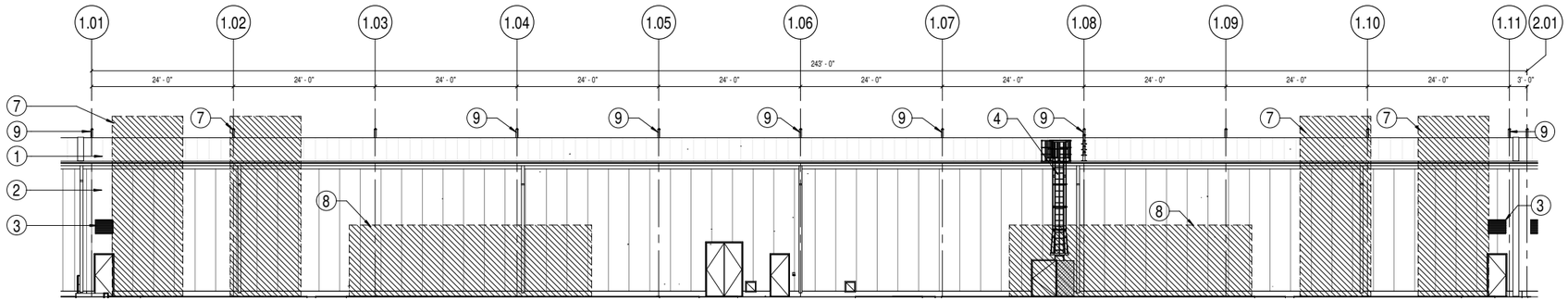
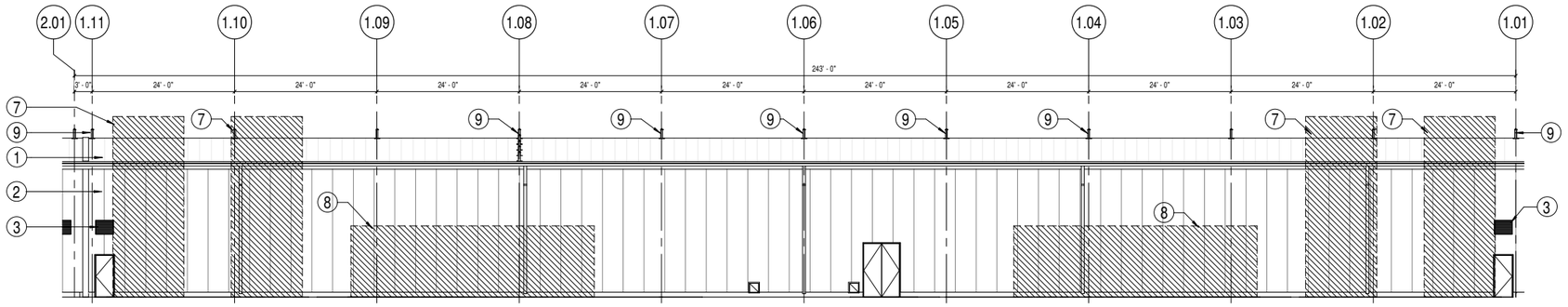


Figure 2-3aR
Overall Elevations for North Building
San José Data Center (SJC02)
San José, California

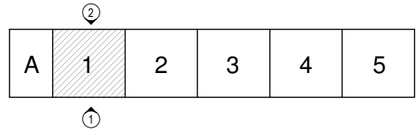


1 ELEVATION - COLO 1 WEST
3/32" = 1'-0"



2 ELEVATION - COLO 1 EAST
3/32" = 1'-0"

① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



NORTH

Figure 2-3bR
Elevation Drawings for Colocation Unit 1, North Building
San José Data Center (SJC02)
San José, California

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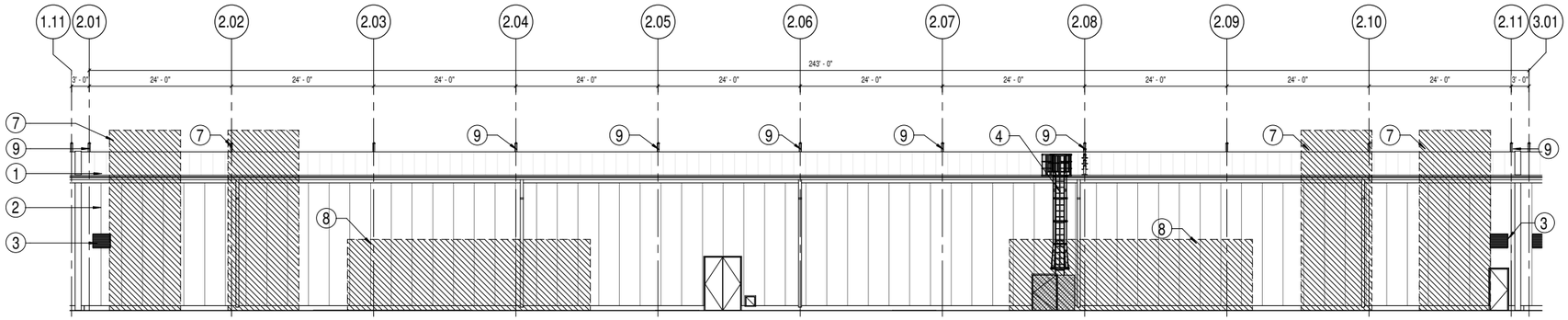
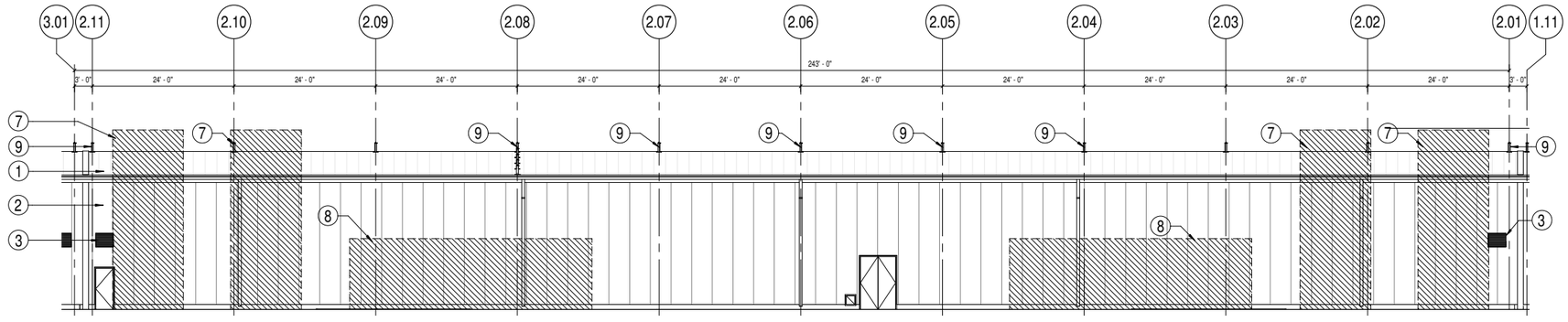
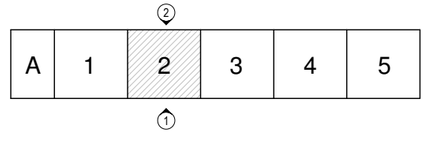


1 ELEVATION - COLO 2 WEST
3/32" = 1'-0"



2 ELEVATION - COLO 2 EAST
3/32" = 1'-0"

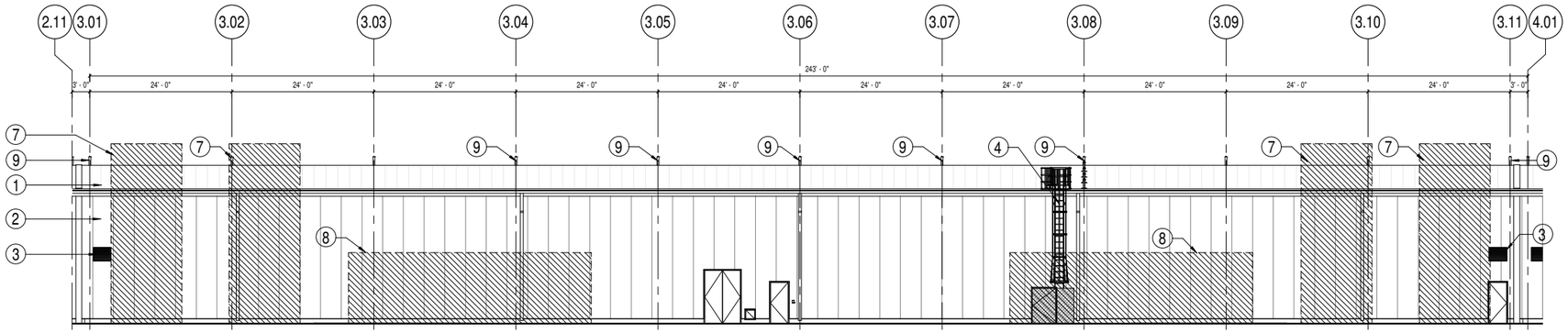
① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



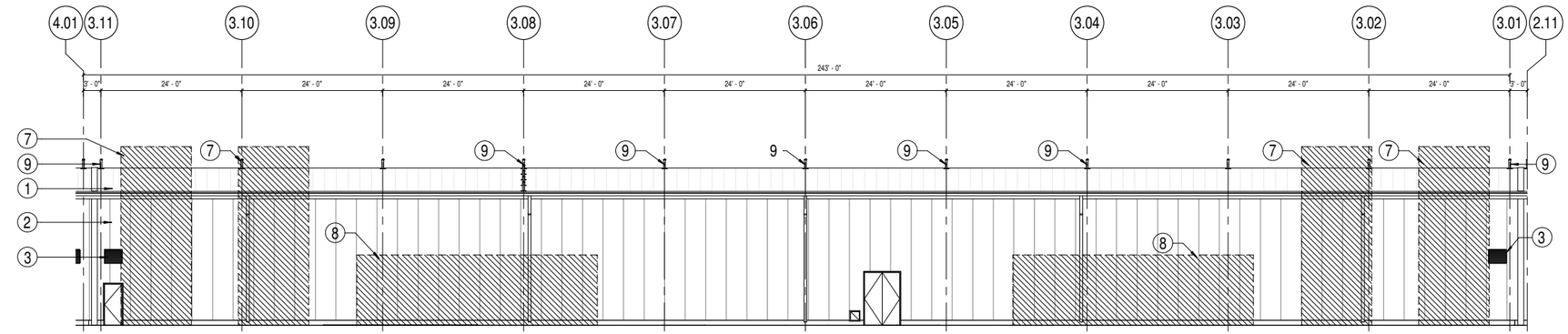
NORTH

Figure 2-3cR
Elevation Drawings for Colocation Unit 2, North Building
San José Data Center (SJC02)
San José, California

JACOBS

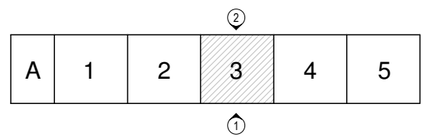


1 **ELEVATION - COLO 3 WEST**
3/32" = 1'-0"



2 **ELEVATION - COLO 3 EAST**
3/32" = 1'-0"

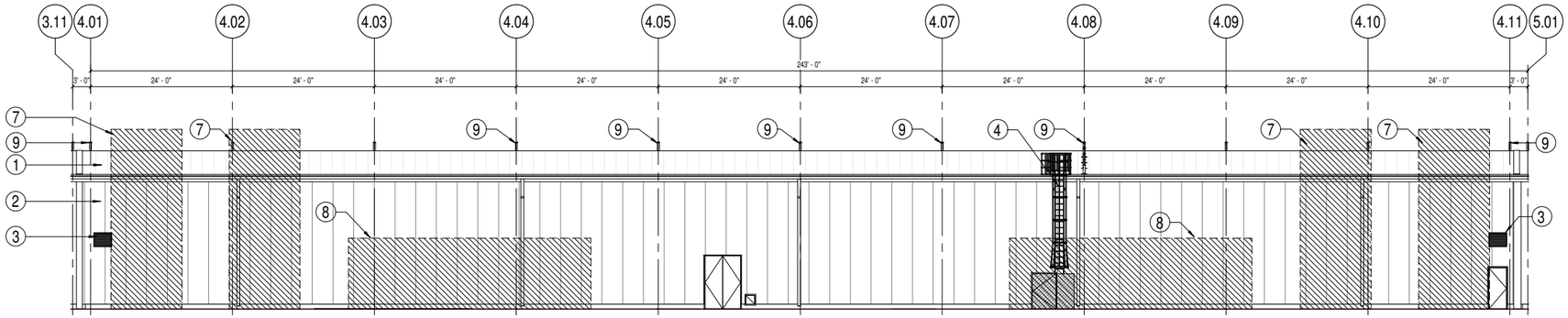
① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



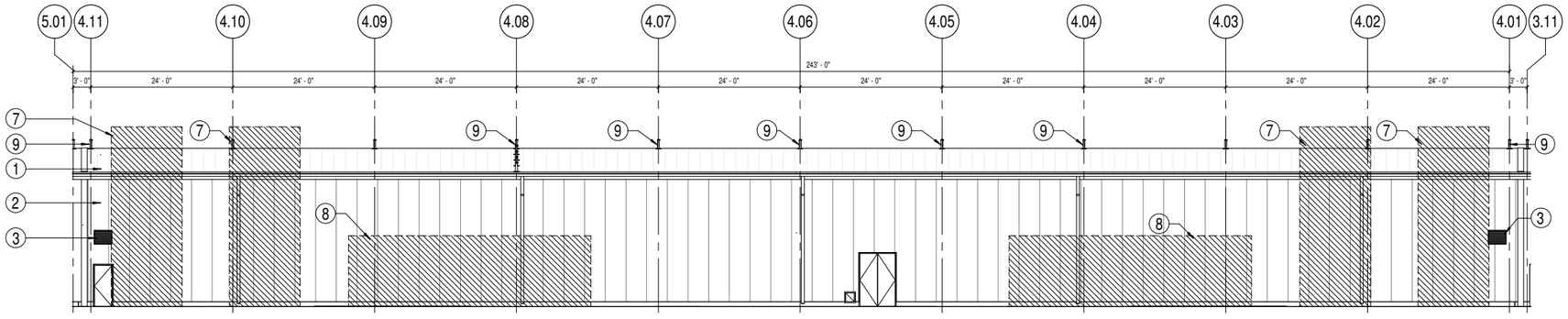
NORTH

Figure 2-3dR
Elevation Drawings for Colocation Unit 3, North Building
San José Data Center (SJC02)
San José, California

JACOBS

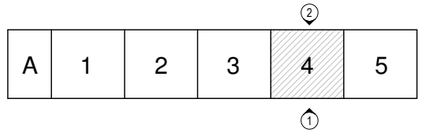


1 ELEVATION - COLO 4 WEST
3/32" = 1'-0"



2 ELEVATION - COLO 4 EAST
3/32" = 1'-0"

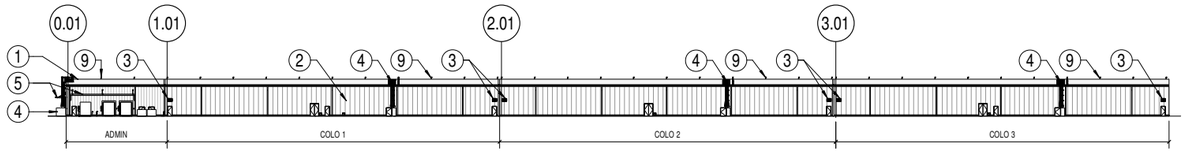
① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



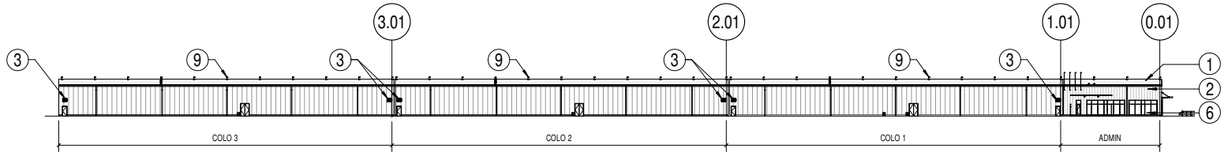
NORTH

Figure 2-3eR
Elevation Drawings for Colocation Unit 4, North Building
San José Data Center (SJC02)
San José, California

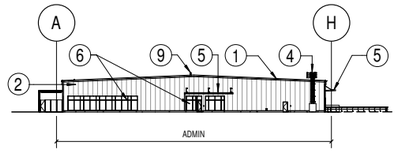
JACOBS



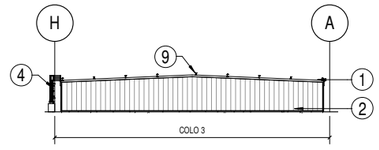
1 - **WEST ELEVATION - ADMIN, COLOS 1, 2 & 3**
1" = 50'-0"



2 - **EAST ELEVATION - ADMIN, COLOS 1, 2 & 3**
1" = 50'-0"

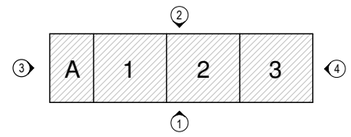


3 - **ELEVATION - ADMIN END WALL**
1" = 50'-0"



4 - **ELEVATION - COLO 3 END WALL**
1" = 50'-0"

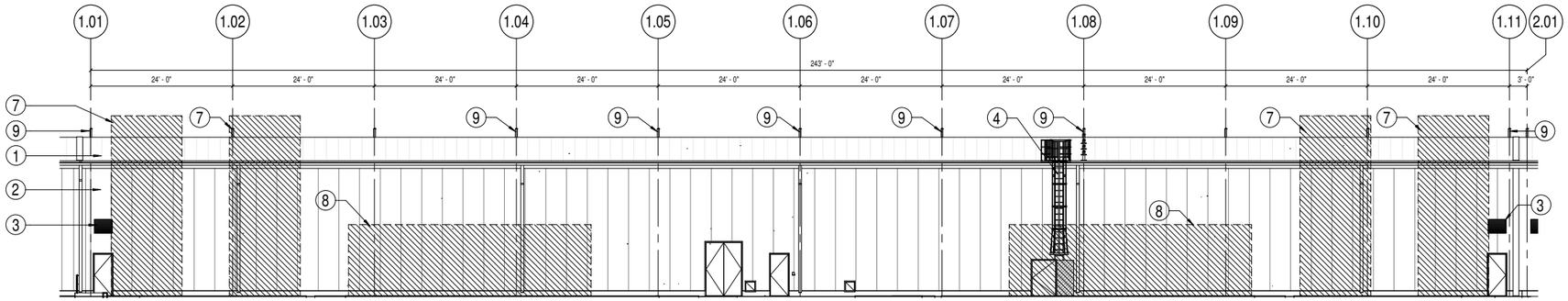
① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



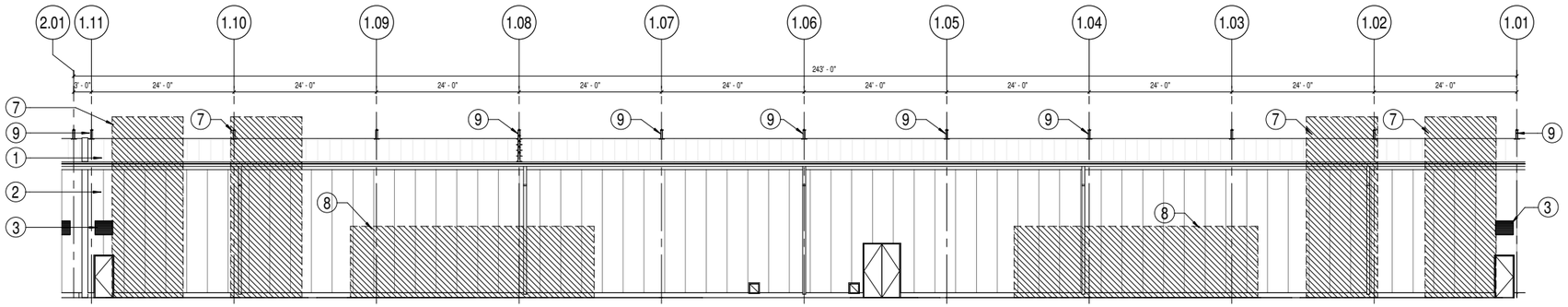
NORTH

Figure 2-4aR
Overall Elevation Drawings for South Building
San José Data Center (SJC02)
San José, California

JACOBS

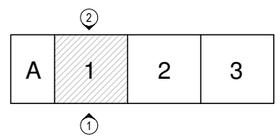


1 ELEVATION - COLO 1 WEST
3/32" = 1'-0"



2 ELEVATION - COLO 1 EAST
3/32" = 1'-0"

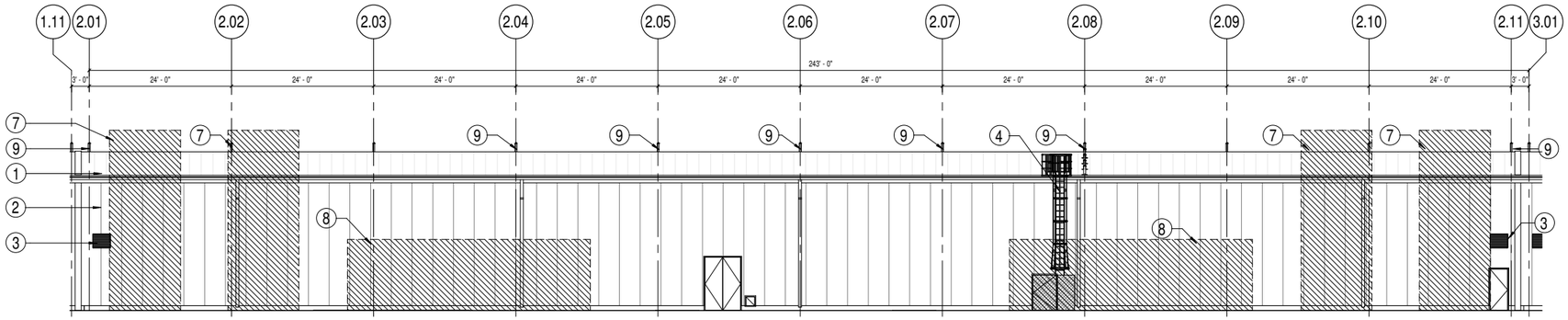
① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



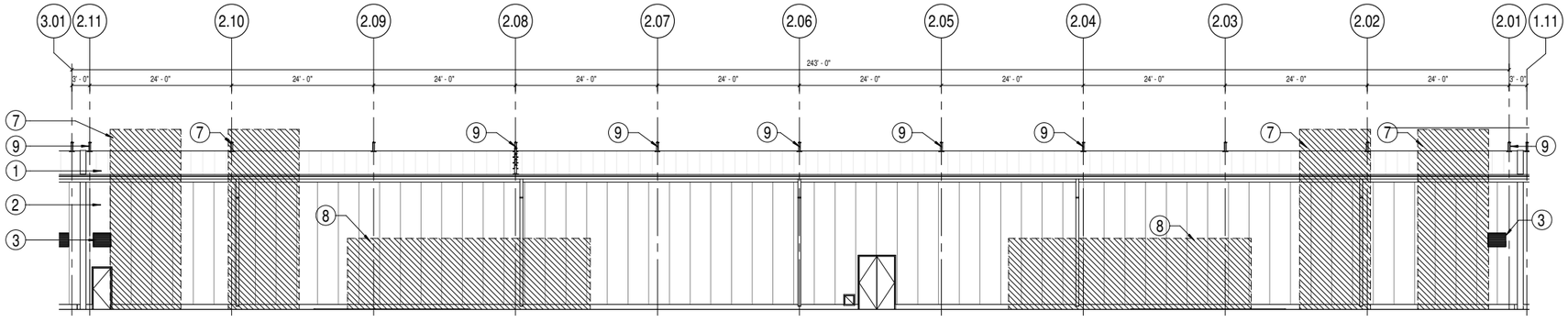
NORTH

Figure 2-4bR
Elevation Drawings for Colocation Unit 1, South Building
San José Data Center (SJC02)
San José, California

JACOBS

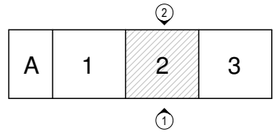


1 ELEVATION - COLO 2 WEST
3/32" = 1'-0"



2 ELEVATION - COLO 2 EAST
3/32" = 1'-0"

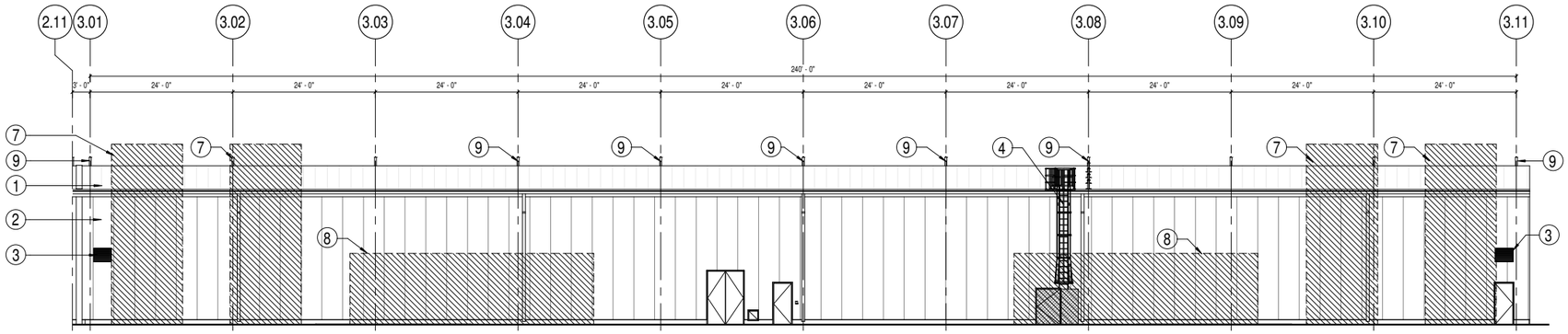
① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



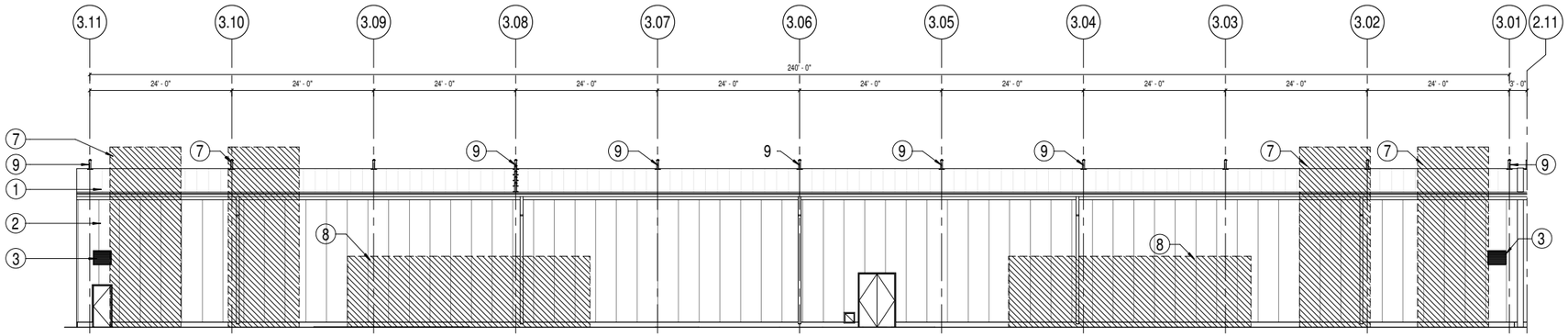
NORTH

Figure 2-4cR
Elevation Drawings for Colocation Unit 2, South Building
San José Data Center (SJC02)
San José, California

JACOBS

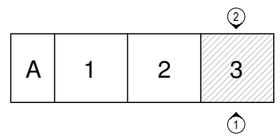


1 **ELEVATION - COLO 3 WEST**
3/32" = 1'-0"



2 **ELEVATION - COLO 3 EAST**
3/32" = 1'-0"

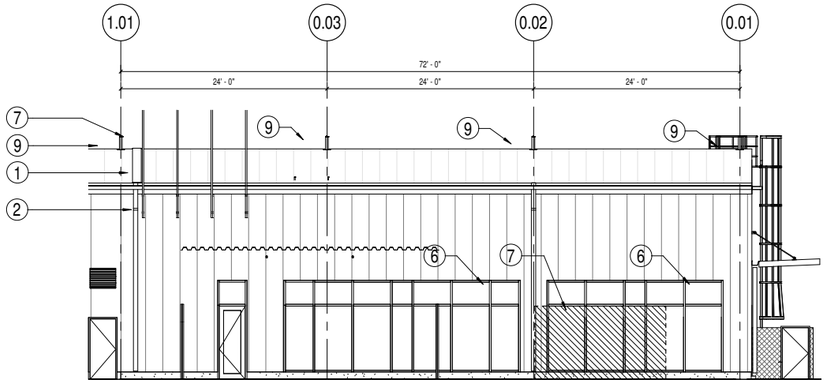
① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



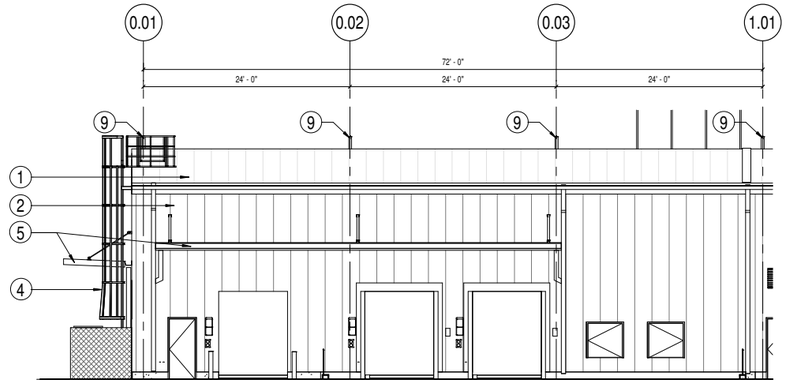
NORTH

Figure 2-4dR
Elevation Drawings for Colocation Unit 3, South Building
San José Data Center (SJC02)
San José, California

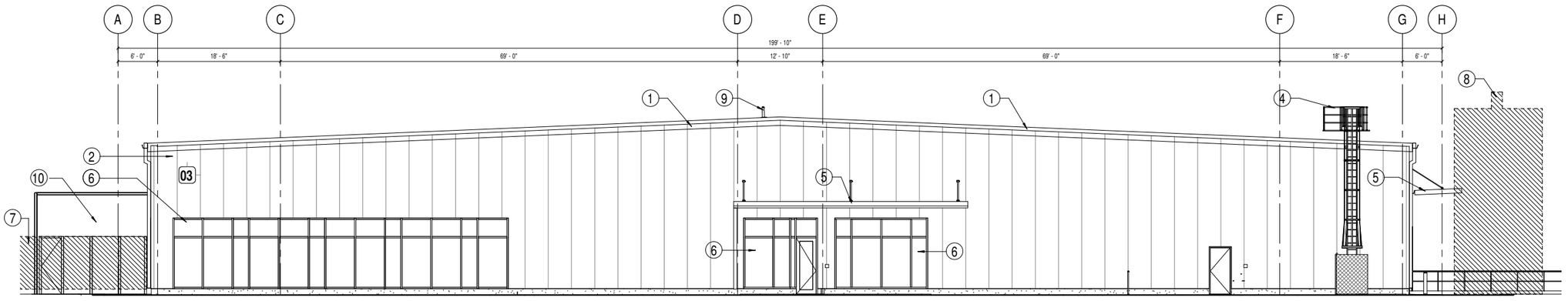
JACOBS



1 ELEVATION - ADMIN SIDE WALL (ENTRY)
1/8" = 1'-0"

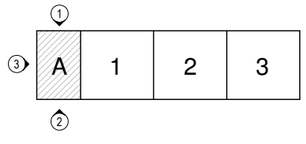


2 ELEVATION - ADMIN SIDE WALL (DOCK)
1/8" = 1'-0"



3 ELEVATION - ADMIN END WALL
1/8" = 1'-0"

① ROOF PANEL 1 (WHITE)
② METAL PANEL 1 (WHITE)
③ MECHANICAL LOUVERS (WHITE)
④ ROOF ACCESS LADDER
⑤ CANOPY
⑥ STOREFRONT 1 & GLASS 1 (CLEAR ANNODIZED & GRAY)
⑦ HVAC EQUIPMENT
⑧ EMERGENCY GENERATOR
⑨ ROOF SAFETY ANCHOR
⑩ EXTERIOR PATIO



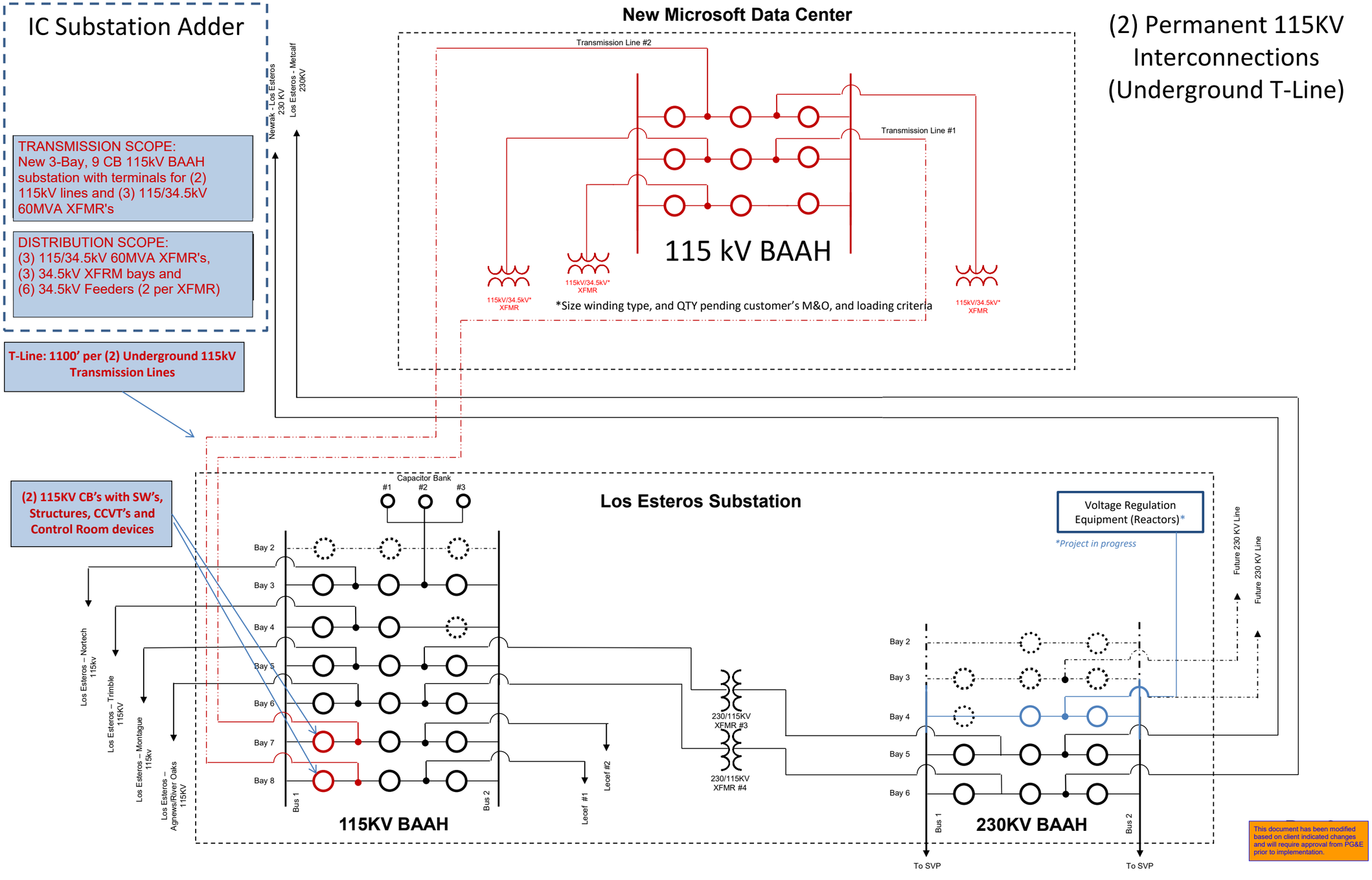
NORTH

Figure 2-4eR
Elevation Drawings for Administrative South Building
San José Data Center (SJC02)
San José, California

JACOBS

Figure 2-5R
Site Rendering
San José Data Center (SJC02)
San José, California

JACOBS



(2) Permanent 115KV Interconnections (Underground T-Line)

Figure 2-6R
Interconnection to PG&E System and One Line Diagram
San José Data Center (SJC02)
San José, California

JACOBS

The PG&E distribution lines supplying electricity to the onsite substation will be located within the ~~SJC~~project~~02~~ site.~~.~~

2.2.1 Electrical Generation Equipment

The 224 natural gas fired generators are packaged by Enchanted Rock 21.9L natural gas engines rated at 0.45 MW (see Section 3.3 – Air Quality for more detailed information on the natural gas engines). Each engine includes two sets of 3-way catalysts that control air emissions, with one set of catalysts installed on each bank of cylinders. The catalyst sets are designed in series with a primary and secondary catalyst. Each bank of cylinders also includes its own exhaust stack, with two exhaust stacks per engine. Seven engines are installed in an enclosure comprising one unit.

The ~~standby~~administrative~~ ~~ generators will be a U.S. Environmental Protection Agency (EPA) Tier-4 diesel-fired generator equipped with diesel particulate filters (DPFs) and selective catalytic reduction systems (SCRs). ~~The IT load generators will be Cummins Model QSK95-G5 NR2 with a standby generating capacity of 3.0 MW.~~ The Admin generators will be ~~Cummins~~ Caterpillar Model ~~QSK50-G5 NR2~~3512C and ~~QSX15-G9~~QSX15, with a standby generating capacity of 1.25 and 0.5 MW, respectively.

~~Each standby generator includes an engine, alternator, and sound-attenuated enclosure. Each generator can be independently operated based on signals from the UPS system programmable logic controllers. The standby generators are optimized for rapid start, with redundant starters, redundant batteries, redundant battery chargers, and a best battery selector switch. Each 3-MW generator is approximately 13 feet wide, 56.5 feet long, and 25 feet tall to the top of the DPF/SCR.~~ The 1.25-MW Admin generator will be approximately 13 feet wide, 41 feet long, and 16 feet tall to the top of the enclosure. The 0.5 MW Admin generator will be approximately 13 feet wide, 41 feet long, and 13 feet tall to the top of the enclosure. Each standby generator will include a separate exhaust stack approximately 30 feet above grade.

2.2.2 Fuel System

The natural gas fired generators will be supplied with fuel from the onsite metering yard, located south of building SJC03. The metering yard is interconnected to PG&E's Lines 101 and 109 via a pipeline that extends approximately 75 feet off the southern property line. Lines 101 and 109 are supplied from different parts of the PG&E natural gas system providing a high level of redundancy and resiliency. In addition, the site is located very near the Milpitas gas terminal which further increases the reliability of natural supply during emergencies.

Each ~~3 MW standby~~administrative generator includes a diesel fuel tank with polishing filtration system. The tank will be located underneath each administrative~~standby~~ generator and provides sufficient fuel storage to operate the generator for approximately 48 hours. ~~The 3-MW standby generators will include a 9,100 gallon tank.~~ The 1.25- and 0.5-MW generators include 4,800- and 2,000-gallon tanks, respectively.

The Applicant will contract with multiple fuel suppliers to provide delivery within 48 hours of a request to confirm fuel availability.

2.2.3 Cooling System

~~Each~~ The generators will be self-contained ~~within an enclosure,~~ with ~~its~~ their own radiators for cooling.

2.2.4 Water Supply and Use

Potable water will be provided by the City of San José (City). Recycled water is available and will be used onsite for process cooling and landscaping purposes. The administrative~~standby~~ generators will require water during the initial filling of the closed-loop radiator system and periodically during maintenance

events. After the initial fill, no further consumption of water by the administrativestandby generators will be required.

Building cooling will be accomplished using adiabatic cooling technology. The adiabatic cooling technology uses a radiator-style cooling system with wetted pre-cooling pads installed upstream of the cooling tube bundle. During lower ambient conditions, the tower operates without using water on the wetted pads. However, during higher ambient temperatures (greater than 75 degrees Fahrenheit), the pre-cooling pads are wetted to reduce the incoming air temperature, resulting in greater heat rejection. The expected total water demand is approximately 29.1535 acre-feet per year, which is primarily recycled water, with less than 1 acre-feet per year negligible quantities of potable water for sanitary purposes and other minor maintenance uses.

2.2.5 Waste Management

Construction- and demolition-related wastes, similar to construction and demolition for comparable projects, will be generated, managed, and disposed of consistent with applicable law, as described in Section 3.9. No significant waste materials will be generated during operation of the SJC02.

2.2.6 Hazardous Materials Management

Each The administrative standby generators will include a double-walled fuel tank to minimize the potential of an accidental fuel release. As diesel fuel is not highly volatile, vapor controls are not required. The space between the walls of the fuel tank will be monitored for the presence of liquids. This monitoring system will be monitored by the onsite operations staff, who will receive automated alerts in the event of fuel leak or release. The diesel fuel and potentially the battery electrolyte (sulfuric acid) represent the only hazardous materials stored onsite in reportable quantities.

Fuel deliveries will occur as needed by fuel suppliers delivering diesel fuel via tanker trucks. These tanker trucks will park near each standby generator for refueling. Fueling will occur within a spill catch basin located under each generator fill connection. The drain to the spill catch basin will be closed prior to the start of fueling. Spill control equipment will be stored within the backup generation yard to allow immediate responses in the event of an accident.

As a safety measure, to the extent feasible, fueling operations will be scheduled at times when storm events are improbable to avoid potential impacts to water resources.

Warning signs will be installed at the fuel unloading areas to minimize the potential of refueling accidents occurring due to tanker trucks departing prior to disconnecting the transfer hose. Also, an emergency pump shut-off will be utilized if a pump hose breaks while fueling the tanks. Tanker truck loading and unloading procedures will be posted at the fuel unloading areas.

2.3 Existing Site Condition

The SJC02 will be located on an approximately 64.5-acre site. The site has been used historically for farming since the early 1920s, but it is not currently in agricultural use. There are were 2 vacant residences and a storage shed/warehouse currently onsite, which wereill be demolished in 2021 after a fire substantially damaged and thus significantly affected the safety of one of the dwellingsas part of the SJC02 project. To the north of the project site are the San José/Santa Clara Regional Wastewater Treatment Plant sludge drying beds, to the south is Highway 237, to the west is the LECEF, a PG&E substation (Los Esteros Substation), and to the east is the Coyote Creek riparian corridor. The project is anticipated to begin construction in the 3rd quarter of 2020, with operations beginning in the 1st quarter of 2022.

The nearest airport, the Norman Y. Mineta San José International Airport, is located approximately 3 miles to the south.

2.4 Project Construction

The Applicant will commence construction of the project after ~~the existing structures have been demolished and~~ any agriculture-related soil contamination is remediated consistent with requirements of the Santa Clara County Environmental Health Department~~to be provided by the local lead agency~~. Possible remediation may include excavation for offsite disposal or capping in place. No offsite staging or laydown areas are proposed, as construction staging will occur on the project site or within the 75-foot construction corridor for linear features (each side of the linear).

~~Demolition of the existing structures and soil excavation and removal work is expected to take approximately 1 month. Once demolition and excavation work is complete, c~~Construction of the project is expected to take approximately ~~16~~ 17 months. Construction ~~and demolition are~~is scheduled to commence in the ~~3~~4th quarter of ~~2020~~ 2022 and completed in the 1st quarter of ~~2022~~ 2024. Construction of the offsite linear features within the offsite infrastructure alignment areas is expected to be completed within the 17-month construction window. Onsite construction is expected to require a maximum of 215 workers (craft and supervisory) per month and an average of 108 workers per month. Maximum and average offsite construction workers are expected to be 72 and 48, respectively. Tables 2-1a and 2-1b presents the construction/demolition workforce by month and classification for onsite and offsite construction.

Tables 2-2a and 2-2b present the expected construction equipment on a monthly basis for onsite and offsite construction. Table 2-3 presents the number of morning and evening vehicle trips to the site for onsite and offsite work.

Table 2-1a. Onsite Construction Workforce by Month and Classification

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Labor Classification																	
Carpenters	0	0	0	1	5	5	5	5	5	8	20	24	24	24	18	12	4
Laborers	12	12	12	12	25	25	25	25	25	25	25	25	25	25	16	12	4
Teamsters	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3	0
Electricians	0	0	0	1	3	3	6	9	12	24	24	30	30	30	24	18	4
Iron Workers	0	0	0	0	12	12	12	12	12	12	9	9	9	9	9	0	0
Millwrights	0	0	0	0	0	0	0	0	0	0	0	0	4	4	6	6	0
Boilermakers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbers	0	0	0	0	6	6	6	6	6	12	12	12	18	18	18	12	4
Pipefitters	0	0	0	0	0	0	0	0	0	4	14	14	14	16	16	10	4
Insulation Workers	0	0	0	0	0	0	0	0	0	0	6	8	12	12	12	12	4
Operating Engineers	6	6	6	6	9	9	9	9	9	5	15	15	7	7	5	4	0
Oilers and Mechanics	1	1	1	1	2	2	2	2	2	4	6	6	8	8	6	6	0
Cement Finishers	0	0	0	0	6	6	6	6	6	6	6	3	3	1	1	0	0
Roofers	0	0	0	0	0	0	0	0	0	0	14	14	14	14	6	3	0
Sheetmetal Workers	0	0	0	0	0	0	0	0	0	2	8	8	12	12	8	8	0
Sprinkler Fitters	0	0	0	0	0	0	0	0	0	6	6	6	6	3	3	0	0
Painters	0	0	0	0	0	0	0	0	0	0	0	4	4	6	6	4	4
Total Craft Labor	24	24	24	26	73	73	76	79	82	113	170	183	195	194	157	110	28
Total Supervision	1	1	1	2	8	12	12	12	20	20	20	20	20	20	12	12	12
Total Staffing	25	25	25	28	81	85	88	91	102	133	190	203	215	214	169	122	40

Table 2-1b. Offsite Construction Workforce by Month and Classification

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Labor Classification																	
Carpenters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laborers	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10	10	4
Teamsters	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3	0
Electricians	0	0	0	1	3	3	3	3	3	3	3	3	3	3	3	3	0
Operating Engineers	2	2	4	4	4	4	4	4	4	4	4	4	4	4	2	2	1
Millwrights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boilermakers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbers	0	0	0	0	0	0	3	3	6	6	6	3	0	0	0	0	0
Pipefitters	0	0	0	0	0	0	0	0	0	4	14	14	14	16	16	10	4
Insulation Workers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oilers and Mechanics	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1
Cement Finishers	0	0	0	0	0	0	0	0	2	2	2	2	3	3	2	0	0
Roofers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheetmetal Workers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sprinkler Fitters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Painters	0	0	0	0	0	0	0	0	0	0	0	4	4	6	6	4	4
Total Craft Labor	28	28	30	31	34	34	37	37	42	46	56	57	55	59	44	34	14
Total Supervision	3	3	3	3	5	10	10	10	10	15	15	15	10	10	10	10	3
Total Staffing	31	31	33	34	39	44	47	47	52	61	71	72	65	69	54	44	17

Table 2-2a. Onsite Construction Equipment by Month

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Description																	
Excavators	4	4	4	4	2	2	2	2	2	0	0	0	0	0	0	0	0
Backhoe	0	0	0	1	2	2	1	1	1	1	1	0	0	0	0	0	0
10-wheel Dump Truck	25	25	25	25	3	2	2	2	2	2	0	0	0	0	0	0	0
Hydraulic Hammer	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Front End Loader	2	2	2	2	3	3	1	1	0	0	0	0	0	0	0	0	0
75-ton Hydraulic Crane	0	0	0	0	0	0	2	2	0	1	1	0	0	0	0	0	0
35-ton Hydraulic Crane	0	0	0	0	0	0	2	2	0	0	0	2	2	0	0	0	0
Fork Lift	0	0	0	1	2	2	2	2	3	3	3	3	3	2	2	1	1
Horizontal Directional Drill Equipment	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Grader	0	0	0	4	4	4	4	2	1	0	0	0	0	0	0	0	0
Compactor	0	0	0	4	4	2	2	2	2	2	2	0	0	0	0	0	0
Water Truck	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
Pick-up Truck	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Light Towers	0	0	0	1	1	1	2	2	2	1	1	1	1	0	0	0	0

Table 2-2b. Offsite Construction Equipment by Month

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Description																	
Excavators	4	4	4	4	2	2	2	2	2	0	0	0	0	0	0	0	0
Backhoe	2	2	2	2	2	2	2	2	2	2	1	0	0	0	0	0	0
10-wheel Dump Truck	3	3	3	3	3	3	3	3	10	10	2	2	2	1	1	1	0
Concrete Trucks	0	0	0	0	0	0	0	0	0	0	0	5	5	5	5	5	0
Hydraulic Hammer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Front End Loader	2	2	2	2	3	3	1	1	1	1	1	1	1	1	1	0	0
75-ton Hydraulic Crane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35-ton Hydraulic Crane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fork Lift	2	2	2	2	2	2	2	2	3	3	3	3	0	0	0	0	1
Horizontal Directional Drill Equipment	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0
Grader	0	0	0	4	4	4	4	2	1	0	0	0	0	0	0	0	0
Compactor	0	0	0	4	4	2	2	2	2	2	2	0	0	0	0	0	0
Water Truck	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Pick-up Truck	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2
Light Towers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2-3. Onsite/Offsite Construction Trip Generation

Trip Type	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Delivery and Haul Trucks	30	30	60	30	30	60
Workers	215	0	215	0	215	215
Total Construction Traffic	245	30	275	30	245	275

Based on the geotechnical investigation, soils in the upper 3 to 5 feet under the project site consist of granular soils of clayey sands, sands, and gravels with variable clay content, and some clays. Under this layer of soils is lean to fat clays to about 25 feet, with loose to medium dense gravels/sand and loose to medium dense sands with gravel, and low to medium plastic sandy lean clays to about 80 feet below grade. The geotechnical investigation determined that the potential exists for liquefaction-induced settlement, lateral spreading, shallow groundwater (7 to 12 feet below grade), and expansive soils; the foregoing findings that are common in this region.

The geotechnical investigation recommends~~suggests~~ the placement of 3 to 4 feet of imported fill on the site, with the use of spread footings for building foundations, and densification techniques to address the liquefaction/lateral spreading and expansive soils. The densification technique involves the vertical and horizontal compaction of soils beneath the foundations to reduce the total settlement to acceptable levels. The geotechnical investigation indicates that densification techniques will disturb soils to approximately 40 feet below grade. Figure 2-7R identifies the expected excavation depths at the project site.

2.5 Project Design Features

The Applicant has incorporated numerous features and best management practices in the project design that are intended to avoid and reduce potential impacts from the project.

These project design features are summarized below and are consistent with best practices and existing regulatory requirements. More detailed project design features are presented in the applicable environmental sections of this Application. ~~They include the following by environmental topic area:~~

2.5.1 Air and Water Quality

- Minimize fugitive dust generation by watering exposed soils two time per day or as needed.
- Cover truck loads when transporting soil, sand, or other loose materials to or from the site.
- Perform street sweeping to remove all visible mud or dirt track-out onto adjacent public roads at least once per day. The use of dry power sweeping is prohibited.
- Limit onsite vehicle speeds on unpaved surfaces to 15 miles per hour.
- Pave onsite roads and driveways, and sidewalks as soon as possible in the construction schedule. Pour foundations for building pads as soon as possible after grading.
- Limit construction equipment idling times to a maximum 5 minutes, or shut equipment down when not in use.
- Maintain and tune construction equipment in accordance with manufacturer‘s specifications.
- Employ a certified visible emission evaluator to verify that construction equipment is functioning properly.
- Post a publicly visible sign with the telephone number and name of the person to contact regarding dust complaints and the Bay Area Air Quality Management District (BAAQMD) telephone number. The contact person will implement corrective measures, as needed, within 48 hours, and the

BAAQMD will be informed of any legitimate complaints received to verify compliance with applicable regulations.

Insert Figure

2-7 Estimated Excavation Depths of Proposed Project

2.5.2 Biological Resources

- Pre-construction surveys will be performed for biological resources by a qualified biologist (bachelor's degree or higher in biological science field) with demonstrated field experience. The surveys will identify any onsite active nests in ~~both~~ trees as well as~~nd~~ burrows within 300 feet of areas that could be disturbed during construction. Surveys will be completed at least 14 days prior, and again 24 hours prior, to the initiation of ground disturbance, or as directed by the City. Additional surveys will be performed if construction lapses for more than 15 days between March and July. During this survey, the biologist will inspect vegetation along the perimeter of the project site and offsite linear areas~~routes~~.
- A no-work buffer will be established around any active nests with an appropriate buffer (25 to 250 feet, depending on species) for the nesting species. The buffer widths will be developed by a qualified biologist, based on species' sensitivity to disturbance, planned construction activities, and baseline level of human activity. The buffers will remain in effect until the young have fledged or the nest is no longer active (as confirmed by the qualified biologist). Inactive nests will be removed by the qualified biologist, and unoccupied burrows will be destroyed.
- The biologist will draft a technical memorandum documenting the result of the survey(s) and any designated buffer zones, which will~~may~~ be submitted to the City prior to the start of ground disturbance activities.
- Prior to the commencement of construction, the Applicant will secure the services of a qualified biologist. The biologist will prepare a Worker Environmental Awareness Training program (WEAT) to instruct construction workers of the obligation to protect and preserve valuable biological resources for review by the City. This WEAT will be provided to all construction workers via a recorded presentation and will include a discussion of applicable laws and penalties under the laws; samples or visual aids of resources that could be encountered in the project vicinity; instructions regarding the need to halt work in the vicinity of any potential biological encountered; and measures to notify their supervisor, the Applicant, and the qualified biologist~~the specialists~~.

2.5.3 Cultural Resources

- Prior to the commencement of construction, the Applicant will secure the services of qualified archaeological and Native American specialists. These specialists will prepare a WEAT program to instruct construction workers of the obligation to protect and preserve valuable archaeological and Native American resources for review by the City. This program will be provided to all construction workers via a recorded presentation and will include a discussion of applicable laws and penalties under the laws; samples or visual aids of resources that could be encountered in the project vicinity; instructions regarding the need to halt work in the vicinity of any potential archaeological and Native American resources encountered; and measures to notify their supervisor, the Applicant, and the specialists.

2.5.4 Paleontological Resources

- The Applicant will secure the services of a qualified professional paleontologist, as defined by the Society of Vertebrate Paleontology, to be on-call prior to the commencement of construction. The paleontologist will be experienced in teaching non-specialists to recognize fossil materials and how to notify in the event of encountering a suspected fossil. If suspected fossils are encountered during construction, the construction workers will halt construction within 50 feet of any potential fossil find and notify the paleontologist, who will evaluate its significance.
- If a fossil is encountered and determined to be significant and avoidance is not feasible, the paleontologist will develop and implement a feasible~~n~~ excavation and salvage plan in accordance with applicable Society of Vertebrate Paleontology standards. Construction work in the immediate area will be halted or diverted to allow recovery of fossil remains in a timely manner. Fossil remains collected will be cleaned, repaired, sorted, and cataloged, along with copies of all pertinent field notes, photos, and maps.
- The paleontologist will prepare a paleontological resource monitoring report that outlines the results of the monitoring program and any encountered fossils. The report will~~may~~ be submitted to the

Director of Community Development for review and approval. The report and any fossil remains collected will be submitted to a scientific institution with paleontological collections.

- Prior to the commencement of construction, the Applicant will secure the services of a qualified paleontological specialist. The specialist will prepare a WEAT program to instruct construction workers of the obligation to protect and preserve valuable paleontological resources for review by the City's Director of Community Development. This program will be provided to all construction workers via a recorded presentation and will include a discussion of applicable laws and penalties under the laws; samples or visual aids of resources that could be encountered in the project vicinity; instructions regarding the need to halt work in the vicinity of any potential paleontological resources encountered; and measures to notify their supervisor, the Applicant, and the specialists.

2.6 Facility Operation

The standby generators will be run primarily for testing and maintenance purposes, and otherwise will not operate unless there is an interruption of the electrical supply or pursuant to dispatch for load shedding, demand response and behind the meter RA. ~~PG&E requests resource adequacy operation~~. ~~The California Air Resources Board's Airborne Toxic Control Measures limits each engine to no more than 50 hours of operation annually for reliability purposes (i.e., testing and maintenance).~~ Tables 2-4a and 2-4b present~~s~~ the expected testing and maintenance operations for ~~each engine~~the diesel and natural gas generators, respectively ~~on a monthly, quarterly, and annual basis~~.

The natural gas generators will operate bi-weekly for approximately 20 minutes. In the event ~~PG&E requests~~ the facility is dispatched to operate the engines to provide ~~resource adequacy~~ load shedding, demand response and behind~~-~~the~~-~~meter RA ~~services~~, the generators will not require maintenance and testing operation until the next scheduled bi-weekly testing event.

Table 2-4a. Standby Diesel Generator Expected Testing and Maintenance Events (per Standby Generator)

Maintenance Event	Duration		Load Factor	Annual Operations
	Frequency	Hours		Hours/Year
Monthly Generation[a]	8	0.42	100%	3.4
Quarterly Generation[b]	3	0.42	100%	1.3
Annual Generation	1	2	100%	2
3-Year Medium Voltage Breaker/Transformer Testing	1	4	100%	4
Contingency Testing[c]	-	1.6	100%	1.6

[a] Quarterly and annual testing is counted as monthly testing.

[b] Annual testing counts as quarterly testing.

[c] The contingency testing was included to provide standby generator operations to support unscheduled maintenance/testing requirements.

Note:
- = not applicable

Table 2-4b. Standby Natural Gas Generator Expected Testing and Maintenance Events (per Standby Generator)

Maintenance Event	Duration		Load Factor	Annual Operations
	Frequency	Hours		Hours/Year
Bi-Weekly Testing	26	0.333	75-90%	8.66

2.7 Alternate Standby Generation Technologies Considered But Rejected

The purpose of the standby generators is to provide a high degree of electrical reliability, which requires installation of redundant systems (i.e., twice as much generating capability as necessary to operate the facility). The natural gas and d~~D~~iesel ~~-fired~~ electrical generators have a long and successful history of satisfying the needs of emergency electrical needs of critical infrastructure. Even though there will be no significant, unmitigated impacts from the project due to the features incorporated into the project design and the incorporation of identified feasible mitigation measures (as described throughout this SPPE Application~~Initial Study~~, where appropriate), the Applicant considered alternate standby generation technologies as potential options. The technologies considered included alternative-fueled generators (propane and~~,~~ gasoline~~, and natural gas~~), fuel cells, renewable generation, and storage. However, none of the alternatives can meet the basic project objectives in a feasible, cost-effective manner, nor are they necessary to lessen any of the impacts from the project.

2.7.1 Alternative Fuel Sources

The use of alternative-fueled generators included consideration of the use of propane- and~~,~~ gasoline-~~, and natural gas- fired~~ standby generators. ~~Each~~ The proposed ~~diesel-fired~~administrative standby generators includes~~s~~ sufficient storage to support 48 hours of continuous operation and multiple contracts with fuel suppliers ~~a diesel storage tank~~ provides added resiliency. Storage of diesel fuel does not require vapor control systems to protect public health and safety and can be stored for indefinite periods of time. Diesel fuel is widely used in automobiles, emergency generators supporting other critical infrastructure (such as hospitals, police stations, or communication systems), and construction equipment. Diesel fuel accounted for 21 percent of the fuels consumed in the United States transportation sector.[3] Diesel fuel has a lower vapor pressure as compared to other fuels (e.g., gasoline, propane~~, and natural gas~~), making it inherently safer to use and store as compared to alternative fuel sources. In contrast, ~~natural gas- and~~ propane gas-fired generators are available in ~~3.0~~1.25 and 0.5-MW units; however, designing and installing an onsite ~~natural~~ propane ~~gas~~ storage system would not be cost effective and would require a significantly larger project site to accommodate the equipment required to pressurize and store the fuel.

The SJC~~02~~ site is uniquely situated in that it has access to a ~~N~~natural gas ~~is supplied~~supply from ~~by~~ two separate connections to two different PG&E distribution pipelines (Line 101 and Line 109). These redundant connections provid~~ing~~e additional redundancy to this fuel supply and minimize the potential supply interruption due to unforeseen events, significantly increasing assurances of reliability. ~~fueled units would also be susceptible to outages from the natural gas supplier in the event of extraordinary natural gas system events (such as line ruptures or supply shortage due to extreme weather events). Propane-fired generators require fuel storage tanks. The amount of propane required to support the expected load of 92 MW of standby generation for 48 hours (consistent with the reliability provided by proposed diesel standby generators) would require multiple storage tanks, increasing the risk to public health from accidental releases from transportation and onsite storage.~~

2.7.2 Alternative Technologies

The Applicant considered whether alternative technologies could provide the same level of reliability and consistency as the proposed standby generators. Fuel cells convert chemical energy, in the form of hydrogen or natural gas, to electricity with water, heat, and carbon dioxide as the possible by-products. Standby fuel cells are configured in ‘stacks’ of units, allowing the fuel cell output to be scalable up to utility scales.[4] ~~The use of fuel cells will either require the installation of a natural gas pipeline, increasing the project’s impacts, or the storage of hydrogen sufficient to generate the expected load of 92 MW. The SJC02 standby generators do not require the installation of a new, significant natural gas pipeline to support the project. Assuming the use of n~~Natural gas fuel cell~~s, and a pipeline of sufficient size and capacity where available, the expected load of 92 MW of fuel cells~~ will require a substantially greater area than is required for the standby natural gas and diesel generators on an already physically constrained site due to the protected Coyote Creek riparian area. ~~Given that the standby diesel generators are~~

[3] https://www.eia.gov/energyexplained/index.php?page=diesel_use

[4] https://www.energy.gov/sites/prod/files/2014/10/f19/ftco_early_mkts_fc_backup_power_fact_sheet.pdf

~~expected to operate for relatively few hours per year for testing and maintenance purposes, the environmental impacts associated with installing a natural gas pipeline of sufficient size for fuel cells in an urban area like San José would have a greater impact than the use of the proposed standby generators.~~ The use of ~~H~~hydrogen as a potential fuel source requires hydrogen storage at significant pressure~~is a highly flammable material stored under significant pressure,~~ and storage is a challenge for stationary and portable applications.[5] Hydrogen is not considered feasible in similar project applications.

Due to the intermittent nature, the use of renewable generation sources (wind, hydroelectric, or solar) on their own would not satisfy the project's need for reliable standby generation. The space and resource requirements for the expected load of ~~92~~ 77 MW of renewable power and their intermittent nature make such applications infeasible for this project and site. Renewable generation resources, such as solar or wind coupled with a battery installation, would require significantly more space than that currently operated by the standby generators; would not fit on the current project site; and would not avoid or minimize any potentially significant impacts.

2.8 Project Objectives

The Applicant's project objectives are as follows:

- Meet the continuing need for a data center to support the San José region's growing business and work force population as well as its growth as a center of innovation consistent with San José's planned land use vision.
- Construct and operate a data center that maximizes the use of the project site~~perty~~ to house computer servers, supporting equipment, and associated administrative office uses in an environmentally controlled structure with redundant subsystems (cooling, power, network links, storage, fire suppression, etc.).
- Locate the data center on property long-planned for industrial uses that is in proximity to existing circulation and utility infrastructure, a reliable large power source, and emergency response access, and on a site capable of being protected, to the maximum extent feasible, from security threats, natural disasters, and similar events.
- Design the proposed data center such that it can be provided with operational electric power via an electric 115/230-kilovolt (kV) substation, and efficiently extend, connect to or otherwise install other utility infrastructure to adequately serve the project, including water, storm drainage, sanitary sewer, electric, natural gas, and telecommunications, as well as new roadway and bike trail improvements.
- Ensure the data center achieves reduced access latency (defined as the time it takes to access data across a network).
- Incorporate reliable, commercially available, and feasible backup generators to ensure uninterrupted power during utility outages, interruptions, or failures, with back-up generation deployed in redundant configurations to achieve a 99.999 percent reliability factor.
- Incorporate use of renewable fuels as primary fuel for backup generators.
- Incorporate, as feasible, environmentally sustainable features into the project, such as bird-friendly building design components and the creation of an environmental buffer zone along Coyote Creek.

[5] https://www.energy.gov/eere/fuelcells/hydrogen-storage