DOCKETED

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Staff used the data in BAAQMD's review (BAAQMD 2021b) and a clarifying email of BAAQMD results (CEC 2021) to estimate the power production during "non-testing/non-maintenance" diesel genset engine use and found that approximately 1,575 MWh was generated during this 13-month (9,504 hour) period. The power generated by these genset engines presumably displaced grid service for the on-site data center facility electrical demand. Based on the installed generating capacity of 686.5 MW partially operating within the 13-month record, the genset engines in BAAQMD's review that did operate would have an extremely low capacity-factor of 0.024 percent [0.024 percent = 1,575 MWh / (686.5 MW * 9,504 hours)]. This capacity factor is only considering the facilities that had genset engines that ran during this 13-month period. Twenty-five of the 45 facilities reporting had zero hours of engine runtime.

Consideration of Extreme Events. California experienced different types of emergency situations within the 13-month period (September 1, 2019, to September 30, 2020) of BAAQMD's review. This period included the expansion of PG&E's PSPS program, severe wildfires, several California Independent System Operator (CAISO) declared emergencies, and winter storms. From August 14, to 19, 2020, California experienced excessive heat. On August 16, 2020, Governor Newsom proclaimed a state of emergency[1] because of the extreme heat wave in California and surrounding western states. This was a one in 30-year weather event that resulted in the first system-wide power outages California had seen in 20 years. In addition to the extreme heat wave in mid-August, high temperatures and high electricity demand occurred over the 2020 Labor Day weekend, especially on Sunday, September 6, and Monday, September 7, 2020 (CAISO 2021). Thus, the data set provided is not necessarily representative of an average 13-month period from which one could extrapolate average genset facility use into the future.

Table B-3 summarizes how these extreme events influenced the runtimes found by BAAQMD's review for each of the 20 data centers.

Table B-3 shows that most "non-testing/non-maintenance" diesel genset engine use identified by BAAQMD's review (over 1,400 engine-hours out of 1,877 engine-hours) occurred either during the August 2020 Governor-proclaimed state of emergency or the subsequent heat event in September. Excluding these extreme events results in 473.7 engine-hours of "non-testing/non-maintenance" diesel genset engine use during other dates, or fewer than two hours per engine for all 288 engines in the review. Out of the 20 data centers that ran genset engines for "non-testing/non-maintenance" purposes, the 473.7 engine-hours of runtime outside of extreme events was spread across 10 data centers out of the 45 data centers covered by BAAQMD's review.

Similarly, staff estimates that over 50 percent of the overall power produced by the genset engines in BAAQMD's review (at least 843 MWh of 1,575 MWh) occurred during the Governor-proclaimed state of emergency, and another 25 percent of the power

[1] https://www.gov.ca.gov/wp-content/uploads/2020/08/8.16.20-Extreme-Heat-Event-proclamation-text.pdf.

produced was attributable to unknown days in the period. Staff's analysis of actual power produced during each day of the 13-month record appears in **Table B-4**.

TABLE B-3 EXTREME EVENTS: NON-TESTING/NON-MAINTENANCE OPERATION (ENGINE-HOURS)

Data Center	Operations During August 2020 State of Emergency (Engine-Hours)	Operations During September 2020 Heat Event (Engine-Hours)	Other Dates of Operations (Engine-Hours)	Sum of Non- Testing/ Non-Maintenance Operations (Engine-Hours)
1	82.7			83
2			76.6	77
3	107.8			108
4	21.6			22
5	11.0			11
6	218.8			219
7	88.2	81.2	32.5	202
8			10.3	10
9	26.0			26
10	259.7		141.1	401
11	75.0			75
12	275.3			275
13			85.0	85
14	19.9		7.6	28
15			98.0	98
16			9.6	10
17			4.0	4
18	9.0		9.0	18
19	24.0			24
20	88.4	14.3		103
Total	**1,307.4**	**95.5**	**473.7**	**1,877**

Sources: BAAQMD 2021b, Energy Commission staff analysis of data from BAAQMD

Across all events, including the extreme event days within the period, **Table B-4** shows that the average genset engine loading in BAAQMD's review was below 40 percent. However, the data does not establish a typical type of operation that could be reasonably expected to occur during any emergency or any typical operational characteristics that could be used in representative air quality modeling. For example, some genset engines in the data set ran at no load or with very low loads; one genset engine ran at no load for 41.7 hours while the highest genset engine load in the data set was 70 percent load. The range of genset engine loads and the fact that most genset engines operated at low loads demonstrates the difficulty in predicting the level of facility electrical demands that would need to be served by the genset engines during an emergency. This also demonstrates the difficulty in making an informed prediction of the genset engines' emission rates, which vary depending on load, in the event of an emergency.

TABLE B-4 EXTREME EVENTS: NON-TESTING/NON-MAINTENANCE OPERATION (ENGINE LOADS)

Date of Event Start	Extreme Heat Wave Event?	Non-Testing/Non-Maintenance Operations - @ actual load (MWh - per day)	Average Genset Engine Loading on Event Day
Unknown		418.0	45.3%
11/26/2019		1.1	13.8%
11/27/2019		5.5	17.7%
2/15/2020		0.7	7.0%
7/31/2020		2.9	17.3%
8/14/2020		39.0	48.0%
8/16/2020		25.6	38.4%
8/17/2020	Aug 2020 Emergency	843.1	34.5%
8/18/2020	Aug 2020 Emergency	112.0	31.2%
8/19/2020	Aug 2020 Emergency	14.4	40.0%
8/25/2020		5.4	30.0%
9/6/2020	Sept 2020 Event	90.0	48.6%
9/7/2020	Sept 2020 Event	16.8	39.2%
Total		**1,574.7**	**Average 31.6%**

Sources: BAAQMD 2021b, Energy Commission staff analysis of data from BAAQMD

Frequency of Diesel Genset Engine Emergency Use, Discussion: The BAAQMD scoping comment illustrates that genset engines were used at data centers for "non-testing/non-maintenance" purposes that could occur more frequently than utility service power outages. In staff's review of prior data center cases that were proposed within the SVP territory, staff found that the likelihood of an outage on SVP's looped 60 kV system that forces the emergency operation of a data center's gensets would be "extremely rare" and a low-probability event. For the prior cases in SVP territory, staff estimated a 1.6 percent probability of any given data center facility experiencing a power outage in a period of a year based on 10 years of data between 2009 and 2019 (e.g. CEC 2020a, CEC 2020b).

In BAAQMD's review, including the extreme events, 1,877 engine-hours of diesel genset engine use occurred at 20 data centers for "non-testing/non-maintenance" purposes (less than half of the 45 facilities included in the review, and less than a third of such facilities under BAAQMD's jurisdiction). These runtimes occurred due to power outages, in response to the heat storm, and also for other unspecified situations categorized by the genset engine operators as "emergencies." BAAQMD's review covered 288 individual diesel genset engines that operated over a 13-month record. Data was not provided concerning the number of genset engines at the 25 facilities that did not operate under these circumstances. Because the genset engines were collectively available for over

2.74 million engine-hours during the 13-month period (288 engines * 9,504 hours), and they were used for emergency operations for 1,877 engine-hours, at those facilities where operation occurred, the genset engines entered emergency operations during 0.07 percent of their available time (1,877 / 2.74 million). This confirms that emergency use of the genset engines would be very infrequent. It is important to note that this calculation only takes into consideration those genset engines that BAAQMD found to run during this time period; a more comprehensive review would also include the availability of the 25 facilities that had zero hours of genset engine run time and also conceivably the 21 facilities that were not surveyed at all. If these facilities without genset engine runs were included, the estimated probability that any given genset engine would be likely to run would be lower.

Duration of Diesel Genset Engine Emergency Use, Discussion: The BAAQMD scoping comment shows genset engines were used for "non-testing/non-maintenance" purposes, mostly due to extreme events within the 13-month record. The average runtime for each event in BAAQMD's review was approximately 5.0 hours. This shows that the duration of diesel genset engine use for "non-testing/non-maintenance" purposes, without excluding the extreme events, could involve longer runtimes than for typical utility service power outages. However, again this calculation does not factor in the larger proportion of facilities that did not run at all. In staff's review of prior data center cases, staff found an average of 2.6 hours per outage, based on only two transmission line outages occurred in 10 years (between 2009 and 2019) affecting data centers served by SVP's 60-KV lines (e.g. CEC 2020a, CEC 2020b).

BAAQMD's review of diesel genset engine use considers a wider variety of reasons for running the genset engines than solely an electric power service outage. The listed reasons include: state of emergency load shedding, human error event, utility-inflicted disturbance, lightning strikes to transmission line, utility outage, power outage, system-wide power quality event, equipment failure, power bump, power supplier request, power blips, UPS/board repair, utility sag event, mandatory load transfer, and substation transformer power equipment failure. Many of these explanations are simply subcategories under the general category of grid reliability analyzed for prior cases. Others like a human error event, equipment failure, and UPS/board repair appear to be exceedingly rare occurrences unlikely to significantly add to the calculation of when emergency operations might occur. Lastly, the category of emergency load shedding/power supplier request/mandatory load transfer all appear related to the heat storm and Governor-proclaimed state of emergency described above and, given the state's efforts to address reliability in response to such events, are unlikely to re-occur with any frequency. The provision of these categories and sub-categories helps to explain why BAAQMD shows more instances of genset engines running than staff found in prior cases and longer durations of runtimes during emergency situations. Although emergency operations could be triggered for a range of situations, including extreme events like those of August and September 2020, this information confirms that regardless of the triggering event, emergency operations of genset engines would be expected to be infrequent and of short duration.

Summary of Staff’s Analysis of “Non-testing/Non-maintenance” Genset Engine Use: BAAQMD’s review of “non-testing/non-maintenance” genset engine operations expands our understanding of “when, why, and for how long” diesel genset engine use might occur. BAAQMD’s 13-month period of review included a Governor-proclaimed state of emergency, other outages, power quality events, and human errors. Accordingly, BAAQMD’s review confirms that genset engine use may occur for reasons other than grid outages, though the period is not representative of a typical year due to the rare heat storm events. Many genset engines were used for “non-testing/non-maintenance” purposes in the period reviewed by BAAQMD, but the overall number of hours of operation for the less than half of the facilities in the review that did run was 0.07 percent of the available time. Genset engine loading levels recorded during these times of use were low (average below 40 percent), and the capacity factor of these genset engines was extremely low (0.024 percent). The BAAQMD review confirms that these types of events remain infrequent, irregular, and unlikely, and the resulting emissions are not easily predictable or quantifiable. The BAAQMD review does not show that these facilities operate significantly more than staff previously analyzed in the grid reliability context in prior cases.

CPUC Decision, D.21-03-056, Directing PG&E, Southern California Edison, and San Diego Gas & Electric To Take Actions To Prepare For Potential Extreme Weather In The Summers Of 2021 And 2022

On March 25, 2021, CPUC adopted decision D.21-03-056, which directed the utilities to take specific actions to decrease peak and net peak demand and increase peak and net peak supply to avert the potential need for rotating outages that are similar to the events that occurred in summer 2020 in the summers of 2021 and 2022. On December 2, 2021, CPUC adopted decision D.21-12-015, which is Phase 2 of the proceeding, and focuses on increasing electric supply and reducing demand for 2022 and 2023 (CPUC 2021b).

Addressed in the decisions are the following scoped issues:

1. Flex Alert program authorization and design
2. Modifications to and expansion of Critical Peak Pricing (CPP) Program
3. The development of an Emergency Load Reduction Program (ELRP)
4. Modifications to existing demand response (DR) programs
5. Expedited Integrated Resource Plan (IRP) procurement
6. Modifications to the planning reserve margin (PRM)
7. Parameters for supply side capacity procurement
8. Expanded electric vehicle participation

This menu of options attempts to ensure grid reliability. One of the options, ELRP, allows PG&E, Southern California Edison, San Diego Gas & Electric, and CAISO to access additional load reduction during times of high grid stress and emergencies involving inadequate market resources, with the goal of avoiding rotating outages while minimizing costs to ratepayers.

The CPUC decisions would allow data centers to choose to participate in a program whereby they could be asked to shed load if an extreme heat event similar to the August 2020 event occurs in the summer of 2022 or 2023. The initial duration of the ELRP pilot program will be five years, 2021-2025, with years 2023-2025 subject to review and revision in the Demand Response Applications proceeding that is expected to be initiated May 2022.[2] However, the CPUC decision lays out many options for emergency load reduction to ensure grid reliability that could be utilized before resorting to gensets. The decision explains that the ELRP design aspects that are subject to review and revision as part of the pilot program include minimizing the use of diesel gensets where there are safe, cost-effective, and feasible alternatives (CPUC 2021a, Section 5.2, page 19).

However, it is not expected that CA3DC would be operational until after the summer of 2023, based on these factors: 1) estimated construction schedule of 15 months for the first phase of the project; 2) estimated completion of CEC exemption proceeding in May or June of 2022; 3) additional time needed for the city and BAAQMD to permit the project. Thus, CA3 would not be online in time to be part of the first phase of ELRP. The next two summers are likely to be the most critical in terms of extra measures needed to ensure grid reliability. It is less likely that these types of measures will be necessary beyond the immediate future, as longer-term strategies for grid resilience, such as battery facilities to supplement intermittent renewable generation, come online.

Additionally, it is unclear whether the U.S. EPA would consider participation in such a program to be an emergency use and, thus, allowed under federal permit restrictions. For these reasons staff does not consider the existence of the ELRP to have any effect on the likelihood of the CA3 Backup Generators operating outside of testing and maintenance.

Furthermore, based on the capacity factors and run times for data centers that operated during the 2020 heat events, even if it were necessary to call on data centers to shed load again, it is expected that these facilities would be called on very infrequently and would have very low capacity-factors and run times in any potential future events.

Electrical Reliability Supporting Information

Staff provided a series of questions to SVP to understand when, why, and for how long gensets would need to operate for any purpose, including PSPSs, other than readiness

[2] CPUC Decision 21-12-015 Attachments 1-3. Available Online at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K821/428821668.PDF

testing or maintenance at CA3DC in the SVP service area.

This supporting information includes the following:

A. VDC Supplemental Responses to Data Requests 15-20 – CA3BGF on June 22, 2021 to staff's questions (including a table listing SVP system outages between January 1, 2009 to June 16, 2021)

B. VDC Responses to CEC Data Request Set 3 – CA3BGF on August 26, 2021

C. Report of Conversation: CA3 Backup Generating Facility docketed on September 21, 2021

D. A schematic diagram of the SVP 230 kV, 115 kV and 60 kV transmission system, SVP System Map, and

E. A list of the customers connected to each of the five 60 kV loops in the SVP system.

A. VDC Supplemental Responses to Data Requests 15-20 on June 22, 2021

15. Please explain whether the Uranium Substation or the Walsh Substation could provide 100 percent power to the CD3DC in the event one of the substations is unable to.

<u>RESPONSE TO DATA REQUEST 15</u>

SVP provided the following response.

Walsh and Uranium Substations are General Distribution Stations for customers connected at 12kV and with loads less than 13.5 MW's. In the event a customer load will exceed 13.5 megavolt ampere (MVA) for a single parcel, as we expect for CAD3DC, then they will be required to build a dedicated substation.

VDC adds that it has proposed the necessary substation improvements and expansion for a dedicated Switchyard in its Application for SPPE to accommodate electricity delivery above 13.5 MVA. The improvements are designed to accommodate full electricity demand of the CA3DC after full buildout.

16. SVP has divided its 60 kV system into "loops" each with its own name; please clarify which loop the CA3DC on-site substation would be interconnected to.

<u>RESPONSE TO DATA REQUEST 16</u>

17. CA3DC will be on the Central Loop. Please explain whether the additional load associated with CA3DC would cause overloads on the SVP transmission system that would require upgrades to the existing system.

<u>RESPONSE TO DATA REQUEST 17</u>

SVP provided the following response.

From SVP's initial investigations, the additional load associated with CA3DC will be loadramp restricted until projects to reconfigure the Center Loop and Northwest loop and certain PG&E projects being developed to increase the transmission capacity to theSVP system are completed. To fully understand the impacts of this facility, SVP is conducting a System Impact Study funded by CA3DC and that information will be presented to CA3DC. The System Impact Study is underway. Once the System Impact Study and the SVP and PG&E projects are completed, CA3DC will be allowed to ramp based upon the approved load ramp schedule. Please see attached letter to Vantage from SVP dated 9/24/2020 for additional details related to when load will be able to be served to this facility.

VDC adds that it is proceeding in constructing and operating the CA3DC in phases as described in its SPPE Application pursuant to the 9/24/2020 letter (attached). The SPPEApplication has been prepared to accommodate the future load growth and electricity availability but presents the "whole of the action" as required by CEQA for full planned buildout of the CA3DC facility.

18. Please provide for the 60 kV loop on the SVP system that would serve the CA3DC:

a. A physical description

b. The interconnection points to SVP service

c. The breakers and isolation devices and use protocols

d. A list of other connected loads and type of customers

e. A written description of the redundant features that allow the system to provide continuous service during maintenance and fault conditions

RESPONSE TO DATA REQUEST 18

The following response was provided by SVP.

a. The loop serving CA3DC is an overhead transmission line comprised of mainly wooden transmission poles, bundled 954 AAC Conductor, serving the Central Clara Area.

b. Interconnection with the SVP system would be in the 60KV Junction Feeder that serves the customer's transformer.

c. SVP utilizes a breaker and half bus design primarily to isolate any faults within each breakers zone of protection, isolating a fault tothe specific location and preventing an extended outage to adjacenttransformers within the substation or to an adjacent substation.

d. Center Loop serves a mix of General Distribution substations and customer dedicated 60kV Junctions for a total of six substations.

e. Loop services are designed to have two sources of power so that inthe event of an unplanned outage, the faulted zone is isolated from the remainder of the loop system, isolating the unplanned outage to the affected zone. In the same manner, a planned outage used to perform maintenance on a section of the transmission line can be performed without having to drop load, by planning the isolation locations around the piece of equipment to be maintained.

19. Please describe any outages or service interruptions on the 60 kV systems that would serve the CA3DC:

a. How many 60 kV lines serve data centers in SVP, and how many data centers are on each?

b. What is the frequency of these outages and how would they require the use of backup generators?

c. How long were outages and what were their causes?

d. Are there breakers on the 60 kV line or disconnect switch(es) and did they isolate the faults?

e. What was the response to the outage(s) by the existing data centers (i.e., initiated operation of some or all back up generation equipment, data offshoring, data center planned shutdown, etc.)?

<u>RESPONSE TO DATA REQUEST 19</u>

The following responses were provided by SVP.

a. SVP currently has five 60 kV loops plus an internal 60 kV loop at the Scott Receiving Station (SRS) and the Kifer Receiving Station (KRS). The number of Data Centers (DC) on each Loop:

i. North East Loop—4 DC

ii. North West Loop—5 DC

iii. East Loop—8 DC

iv. Center Loop--18 DC

v. South Loop—5 DC

vi. SRS Internal Loop – 2 DC

vii. KRS Internal Loop – 4 DC

b&c. There were four outages between January 1st, 2009 and June 16, 2021 where SVP lost both 60kV feeds into a substation that affected a data center where back-up generators were required to operate. Over this period, this equates to a system reliability of 99.98%.

The outages occurred on May 28th, 2016 (7 hours 23 minutes), December 2nd, 2016 (12 minutes) and two different outages on August 16th, 2020 (one 2 hours 21 minutes and second 10 hours 22 minutes). This is a total outage time affecting data centers of 20 hours and 18 minutes. Only the data centers at various locations on the associated loops were affected, not all data centers.

Since 2009, 60kV outage data is presented in the below table (over 12 years, 5 months of data). The items highlighted in yellow indicate that there was some kind of fault occurred. The items highlighted in blue is when we had a customer out of power as a result. The non-highlighted items are where an outage was taken to correct an observed situation.

d. Each loop has breaker/switches and they operated as expected. SVP does not have knowledge of how each data center reacts to an SVP-caused outage. SVP only know the times we restored service.

20. Please provide the following regarding PSPS events:

a. Would historical PSPS events have resulted in the emergency operationsof the backup generators at the proposed CA3DC?

b. Have there been changes to the SVP and PG&E system around the CA3DC that would affect the likelihood that future PSPS events would result in the operation of emergency generators at the proposed CA3DC?

RESPONSE TO DATA REQUEST 20

SVP provided the following responses.

a. To date, SVP has not had any historical PSPS events. As such there has been no impact to SVP or SVP customers by a PG&E initiated PSPS event in other areas.

b. SVP has not been notified of any changes related to PG&E’s transmission system that would change the likelihood of futurePSPS events.

DATE	LINE (S)	CAUSE	DURATION	CUSTOMERS OUT OF POWER
01/29/21	HOM-BRO	Tree Trimming	1 Hour 38 Min	0
12/29/20	ZEN-URA	Tree Trimming	1 Hour 25 Min	0
09/26/20	HOM-BRO	Tree Trimming	2 Hours 55 Min	0
09/22/20	NAJ-PLM	Tree Trimming	1 Hour 36 Min	0
08/16/20	KRS 60KV BUS AND LAF SUB	Multiple Lightning Strikes	2 Hours 21 min	1273
08/16/20	WAL-FIB, WAL-URA	Multiple Lightning Strikes	10 Hours 22 min	5438
10/24/19	MIS CB62 (NRS-MIS)	Hot Spot Repair	29 Min	0
10/11/19	WAL-FIB	Balloons close to line	6 Min	0
09/17/16	KRS-PLM	Rotten Pole Replacement	10 Hours 5 Min	0
08/14/19	SRS CB982-(SRS-CEN)	Faulty JMUX Card	4 Min	0
03/30/19	URA-WAL	Bird @ UW43	1 Hour 46Min	0
11/22/18	HOM-SER	Pole Fire HS9 (forceout)	1 Hour 27Min	0
07/5/18	SER-HOM	Force out to removeballoons	9 Min	0
05/5/18	SER-HOM	Force out to remove balloons	11 Min	0
09/1/17	AGN-NAJ	Force out to cut trees	1 hour 5 min	0
08/8/17	URA-ZEN	Force out to remove balloons	20 Min	0
05/25/17	SRS-FRV	Tripped during SCADA commissioning	1 Min	0
05/8/17	NWN-ZEN	Force out to remove bird	50 Min	0
04/29/17	SRS-HOM	Force out to remove balloons	2 hours 22 min	0
03/20/17	JUL-CEN	Third Party got into 60kV	9 hours 55 min	0
01/22/17	SER-BRO	Tree in wires	3 hours 31 min	0
01/22/17	NAJ-PLM	A phase contact guy wire when winds pick up	1 hour 47 min	0
01/19/17	KRS-PLM	Palm frond between phases	41 min	0
01/18/17	NAJ-PLM	A phase contact guy wire when winds pick up	1 Hour 44 min	0
12/02/16	RAY T1 & T2	Dropped both transformers during restoration switching due to relay not reset	12 minutes	257
09/06/16	SRS-CEN	Bird Contact	40 Min	0
06/30/16	WAL-FIB	Bird nest contact	12 hours and 4 min	0
05/28/16	SRS-FRV- NWN-ZEN	Balloons in line and breaker fail	7 hours 23 min	28
02/17/16	SRS-FRV	Palm tree with fire	7 hours	0
11/18/15	SER-BRO	Arcing wires forced	2 hours 59 min	0
11/16/15	SER-BRO	Rotten Pole- forced	22 hours 32 min	0
11/09/15	JUL CB32	Possible lightning	53 min	0
10/29/15	SER-BRO	Roller arcing-forced	3 hours 33 min	0
DATE	**LINE (S)**	**CAUSE**	**DURATION**	**CUSTOMERS OUT OF POWER**
08/12/15	BRO-DCJ, BRO T1	Squirrel on CB100	3 hours 55 min	2155
06/24/15	CCA CB22	Bad JMUX card	3 hours 23 min	0
05/30/15	SER-BRO	No cause found	3 hours 12 min	0

03/31/15	BRO-DCJ 12KV BUS 1& 2	Squirrel across 12kv bus tie	3 hours 26 min	2927
01/28/15	Mission CB12	Shorted control cable	6 hours 29 min	0
04/24/14	DCJ CB42	Tripped during relay work. BF wired as TT	1 Hour 30 Min	0
10/14/13	URA_WAL	Sheared Hydrant hit 60kV above	2 hours 26 min	0
12/06/12	Jul CB 32	Tripped due to cabinet vibration	2 min	0

September 24, 2020

Vantage Data Centers
Sam Huckaby, Vice President – Construction
2820 Northwestern Parkway
Santa Clara, CA 95051

Subject: New Data Center at 2590 Walsh

Dear Mr. Huckaby,

The City of Santa Clara's Electric Department, Silicon Valley Power, is the electric utility for the City of Santa Clara. Electric service to the subject project will be provided in accordance with the Rules and Regulations for the utility as approved by the Santa Clara City Council. Silicon Valley Power has reviewed the power needs and commitments at all Vantage sites within the City per the property list below:

- 2820 Northwestern
- 2897 Northwestern
- 737 Mathew
- 2590 Walsh (new proposed project not yet approved – request for 90 MVA)

Based on Vantage's existing and future power needs, Silicon Valley Power should be able to provide the following total power combined for all the sites:

- Up to 126.5 MVA from the current date to the end of Second Quarter of 2022
- Up to 192.5 MVA at Third Quarter of 2022 upon completion of the South Loop Project.
    - If there are delays on the South Loop Project, it will affect the timeline to increase from 126.5 to 192.5.
    - 737 Mathew is limited to 33 MW until the South Loop Project is completed.
- Silicon Valley Power is starting the process for additional transmission capacity to the City. The conceptual timeline for completion is Fourth Quarter of 2025. Upon completion of additional transmission, Vantage can increase from 192.5 MVA to 273 MVA.
- If Vantage has a need to exceed 192.5 MVA prior to these timeframes, the City would be interested in partnering on a battery storage project or other generation facility to serve those needs.

The specific details of this service and SVP system modifications required to provide this capacity for 2590 Walsh will be worked out in a Substation Service Agreement at a future date. The City is also in the process of reviewing and updating its load development fee, which will be applicable for any new project (or above 192.5 MVA). It is also important to note that all appropriate fees will need to be paid, and this letter does not supersede any requirements or agreements for the already approved sites at 2820 Northwestern, 2897 Northwestern, and 737 Mathew.

Questions can be directed to Wendy Stone at (408) 615-5648.

Thank you,

Manuel Pineda
Chief Electric Utility Officer
City of Santa Clara – Silicon Valley Power

cc: Michael Stoner

B. VDC Responses to CEC Data Request Set 3 – CA3BGF on August 26, 2021

5. Please provide the System Impact Study.

RESPONSE TO DATA REQUEST 5

The background provided is generally correct, but Vantage provides additional clarification. As described in the SPPE Application, the CA3DC will be constructed but leased to clients over time in accordance with the then present demand for data center space and services. Additionally, as with every data center project or any other project that would require electricity, Vantage's future clients cannot occupy portions of the CA3DC without Vantage's ability to provide the electricity necessary for the client's demand. This is unlike a power plant which upon reaching commercial operation would have the ability to transmit all of its electricity to the grid, the CA3DC will ramp up its electrical demand over time. That demand curve is unknown, but Vantage believes that ultimately the entire CA3DC can be successfully leased and occupied by clients.

As described by SVP at evidentiary hearing in prior proceedings, it works closely with all of its large electricity users, especially data centers, to forecast increasing electrical demand on an annual basis. If SVP simply did not have the ability to serve Vantage's predicted demand, Vantage could and would not increase its electrical demand until SVP could provide the electricity. Therefore, Staff's reliance on a System Impact Study for use in its CEQA analysis is misplaced. There can be no environmental impact associated with SVP's inability to provide electricity to meet Vantage's desired electrical demand.

Therefore, the background's assertion that "the build out of the data center would be restricted until the impacts on the SVP are understood" is only partially accurate. A better statement would be that Vantage simply could not use more electricity than SVP can provide. Therefore, as with other projects approved by the Commission, the System Impact Study is not needed for the Commission to be able to complete its analysis.

Unlike a System Impact Study for a power plant, the SVP System Impact Study will study the ability to serve the CA3DC over the long term in addition to serving other existing and new users. In other words, the System Impact Study is not solely studying the impacts to the system from the CA3DC alone.

Vantage has already included the known upgrades to the SVP system necessary for it to receive electricity at the CA3DC site. They include the new substation and switching station and the overhead wires and poles necessary to interconnect to the Uranium Substation. Any other upgrades would not be specifically attributable to the CA3 alone and therefore, would not be required for Staff's CEQA analysis.

For example, as shown in Attachment PD DR-5, SVP acknowledges that it requires outside the system upgrades to be performed by PG&E to increase electricity imports into its system. These network upgrades are not solely the result of the CA3DC, but instead are the result of all the increased electrical demand forecasted by SVP. These outside the system upgrades are part of the Transmission Planning Process. Such upgrade projects have not yet been defined but would be subject to CEQA at the time they are proposed by PG&E.

Similarly, as part of SVP's network upgrade evaluation, if it is determined that additional network upgrades would be necessary to serve future load, such network upgrades would be processed within the City of Santa Clara and compliance with CEQA would be conducted by the City at the time the network upgrade is proposed. This is how the upgrades to the SVP "loops" was performed. While new users benefit from the loop upgrades, no individual project was the sole cause for the loop upgrades.

Staff should not treat these potential future upgrades as "part of the whole of the action" with the CA3DC because they are not caused by CA3DC, are not necessary for the project to be built, and are part of the routine SVP planning processes to serve future load.

Vantage believes that the letter provided by SVP in Attachment PD DR-5 is sufficient for it to fulfill its obligations under CEQA and to determine that the CA3DC will not cause environmental impacts associated with SVP's supply of electricity.

6. Please identify any system upgrades that would be required to fully support the CA3DC.

RESPONSE TO DATA REQUEST 6

See Response to Data Request 5.

C. Report of Conversation: CA3 Backup Generating Facility docketed on September 21, 2021

1. Generally, what is the System Impact Study?

   a. What is the purpose of the study?

   RESPONSE TO Question a.

   The System Impact Study evaluates the SVP transmission system for impacts based on the projected load from the specific project.

b. Does the study look at overall SVP system needs or is it specific to the Vantage Data Centers?

RESPONSE TO Question b.

The System Impact Study evaluates the overall SVP system and where we think issues will occur within SVP and potentially with the interconnection points we have with the CAISO controlled electric grid.

c. When will the study be completed?

RESPONSE TO Question c.

Anticipated completion 12/2021, but can be as late as Q2 of 2023. Depends on the CAISO TPP 2021/2022 Reliability report findings, and approved mitigation work by PG&E.

d. When completed, will the study identify specific SVP transmission/distribution system upgrades that are directly assigned to the CA3 Data Center at 2590 Walsh Ave?

RESPONSE TO Question d.

Yes, for SVP's system. The present CAISO TPP 2021/2022 reliability model does not account for CA3, however it does account for load growth of the Applicants two other data centers in SVP's territory that may be used to grow load at CA3 instead. The mitigations approved by the CAISO will provide a schedule when capacity may be available for CA3 to connect to the system. In addition SVP may decide to add CA3 to the new TPP 2022/2023 forecast presently being developed. The reliability model for this TPP 2022/2023 year will not be ready until August 2022. SVP expects that the TPP 2022/2023 reliability report and approved mitigation plans will provide a ramp up schedule for CA3.

2. The project owner's statement indicates that there are both SVP projects and PG&E projects that are "being developed" and until these projects are completed the CA3 Data Center will be limited in the amount of load it can connect to the SVP system.

    a. What are the PG&E projects that are "being developed"?

    RESPONSE TO Question a.

    PG&E projects for CA3 have not yet been identified since this project was not included in the 2021/2022 Transmission Planning Process (TPP). If this project (CA3) is elected to be included in the SVP Load Forecast for TPP 2022/2023, and the CEC adopts SVP's load forecast. Then CA3 load will be included for the CAISO to consider in their approved TPP 2022/2023 projects.

    i. Are there specific line upgrades that have been identified?

    RESPONSE TO Question i.

It is anticipated that the TPP 2021/2022 Approved projects will provide for a significant increase in Load Service Capacity to the SVP system beyond its projected load growth. However, we will be monitoring any PG&E construction schedules provided by PG&E and provide the estimates to the customer on when capacity may be available for their load ramp.

ii. When are they expected to be completed?

RESPONSE TO Question ii.

Unknown

iii. Are these upgrades directly attributable to the CA3 Data Center or are they more generally being developed for SVP loads as a whole? What is the expected date of operation for any identified upgrades?

RESPONSE TO Question iii.

Unknown

b. What are the SVP projects that are "being developed"?

i. Are there specific line upgrades that have been identified?

RESPONSE TO Question i.

Yes

ii. When are they expected to be completed?

RESPONSE TO Question ii.

To be determined

iii. Are these upgrades directly attributable to the CA3 Data Center or are they more generally being developed for SVP loads as a whole? What is the expected date of operation for any identified upgrades?

RESPONSE TO Question iii.

Directly and as a whole to SVP's system. Upgrades will occur over the next 3-6 years.

3. If possible, we would appreciate a general description of what is happening on the SVP system as a whole with load growth due to data centers and other end users and how that relates to the need for upgrades on the PG&E system into SVP and upgrades within the SVP system.

RESPONSE TO Question 3.

Over the past several years, a number of data centers in Santa Clara have received a Small Power Plant Exemption (SPPE) from the CEC. The approved projects currently under construction in Santa Clara represents a significant increase in load. This information was presented to the CEC in the fall of 2020 for an update to the CAISO 2021/2022 Transmission Planning Process (TPP). The CEC and CAISO evaluated SVP's data and ultimately recommended SVP's load growth be included in the Base Case for the 2021/2022 TPP process. During the CAISO Governors Board meeting in the Spring of 2021, SVP's growth was adopted the Base Case TPP plan approved by the Governor's Board.

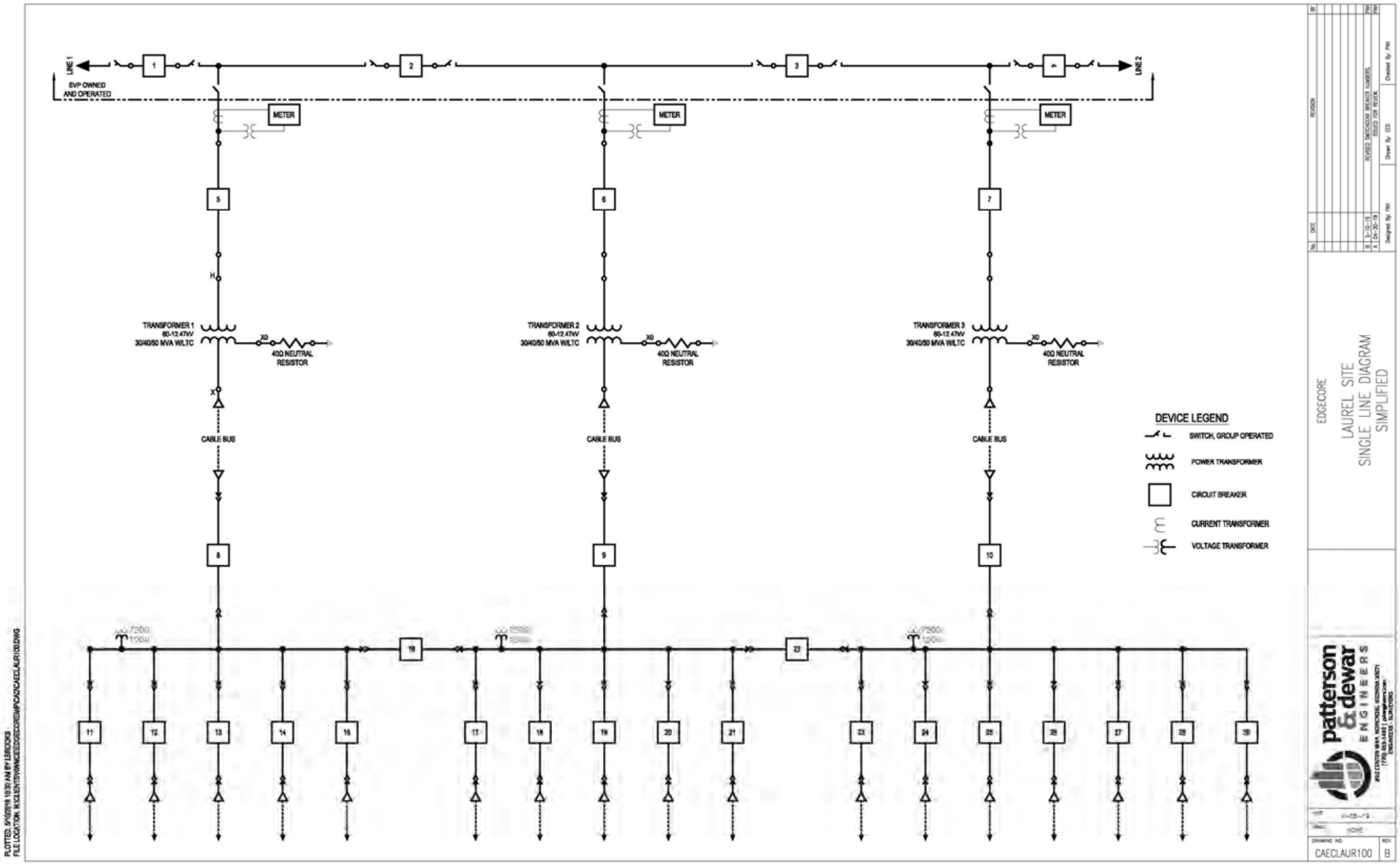
SVP's peak load has been near 600 MW. At approximately 780 MW, SVP experiences N-1 issues with SVP's ability to support a higher load. SVP's adopted load growth for the 1 in 10 scenario is an increase to 1,130 MW by 2031. PG&E is currently studying what projects are required to meet this load growth and will be providing its mitigation plans to the CAISO in September 2021. The CA3 data center is not included in this load growth. As the CA3 projects become real (once CEQA is finalized and the project earns entitlements), SVP will add it to our projections per the CEC guidance we have received. SVP will be updating the projections to the CEC on a yearly basis.

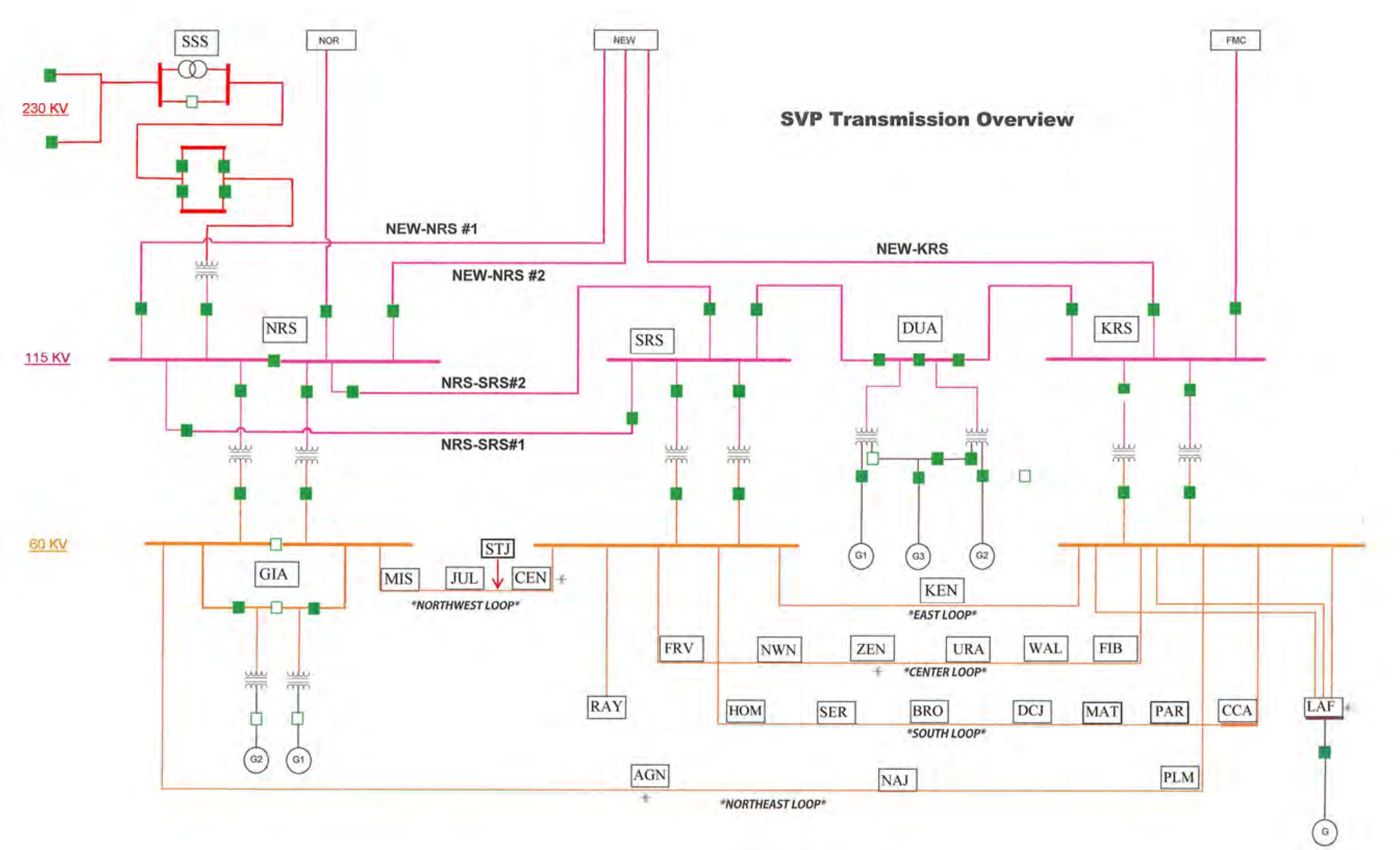
PG&E is currently studying the effects of this load growth and SVP has shared with PG&E potential projects being investigating. Identified projects will be presented Fall of 2021 and voted on by the CAISO Governors Board in the Spring of 2022. Timing of these projects is currently unknown.

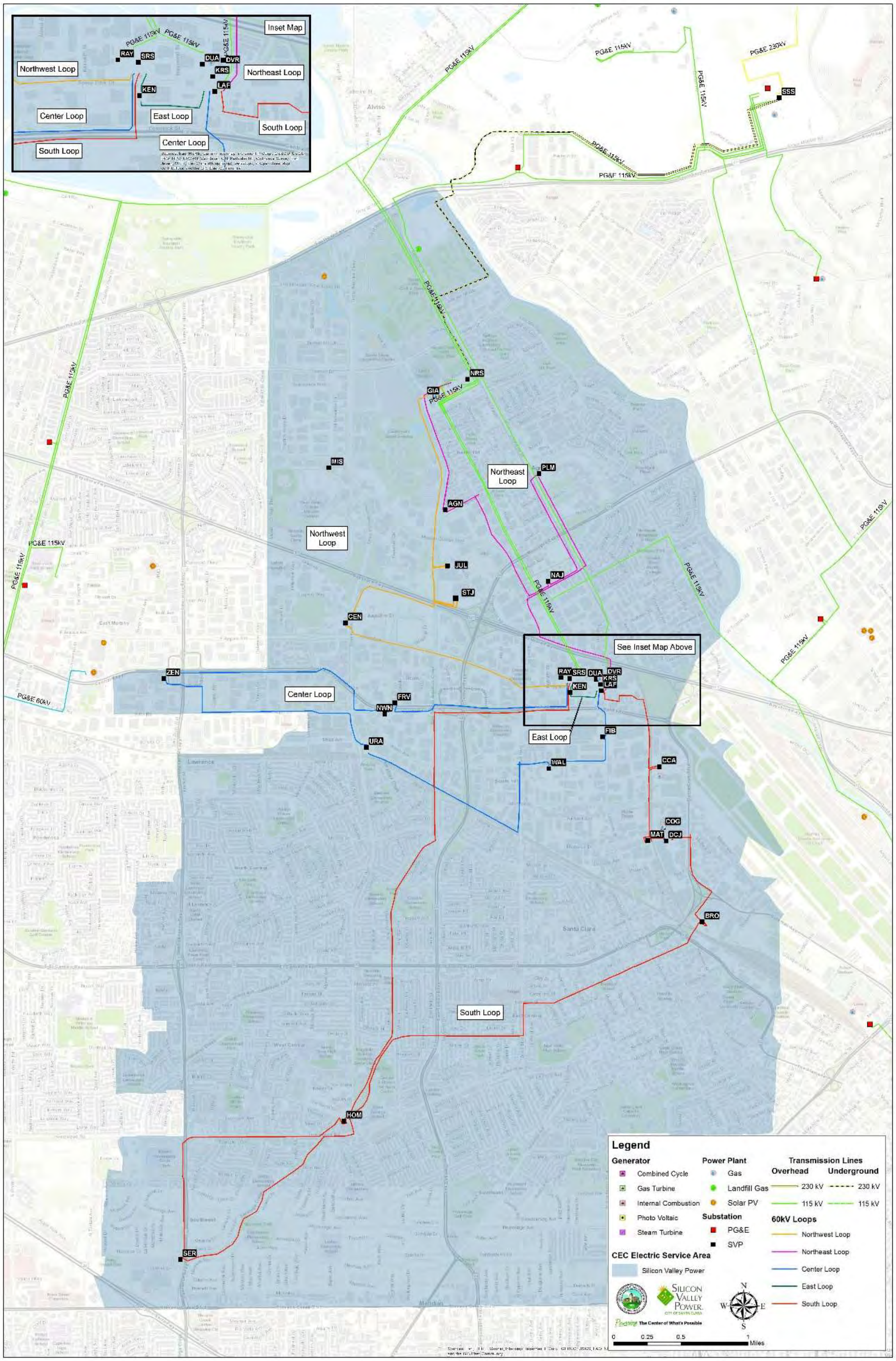
In regard to the Vantage projects, they approached SVP with utilizing unused capacity they currently have entitlements for in Santa Clara for a new data center, CA3. The letter you attached limits their ability to go above certain limits based on projects currently in progress and futures once yet to be identified. The first project is completion of the South Loop Project. This is a project that has been in developments for nearly 10 years, includes reconductoring and splitting of existing loops. This project has gone through CEQA, engineering, easement acquisition and is currently being bid. Construction should begin by the end of the year and be completed by end of 2nd quarter 2022. This will enable the McLaren data center to increase their load. The next level of projects required to go beyond the established numbers are in PG&E system. The McLaren data center, plus other approved data centers were included in the load forecast provided to the CEC and ultimately adopted by the CAISO Governors Board. These projects are currently being studied through the 2021/2022 TPP process.

SVP cannot provide an estimate when Vantage's portfolio will be able to go beyond the values included in the referenced letter. Specifically, the 192.5 MW value. There are options for additional storage facilities to accommodate above the 192.5 MW values. The SVP system limitations are during peak temperature days for up to 4 hours per day which may occur 20 to 30 times annually. Vantage has not approached SVP related the storage options.

D. Schematic diagram of the SVP 230 kV, 115 kV and 60 kV transmission system, and SVP System Map


LINE 1
LINE 2
SVP OWNED AND OPERATED
METER
METER
METER
TRANSFORMER 1 60-12.47kV 30/40/50 MVA W/LTC
TRANSFORMER 2 60-12.47kV 30/40/50 MVA W/LTC
TRANSFORMER 3 60-12.47kV 30/40/50 MVA W/LTC
40Ω NEUTRAL RESISTOR
40Ω NEUTRAL RESISTOR
40Ω NEUTRAL RESISTOR
CABLE BUS
CABLE BUS
CABLE BUS
DEVICE LEGEND
SWITCH, GROUP OPERATED
POWER TRANSFORMER
CIRCUIT BREAKER
CURRENT TRANSFORMER
VOLTAGE TRANSFORMER
EDGECORE
LAUREL SITE
SINGLE LINE DIAGRAM
SIMPLIFIED
patterson & dewar
ENGINEERS
CAECLAUR100
B


SVP Transmission Overview
230 KV
115 KV
60 KV
SSS
NOR
NEW
FMC
NEW-NRS #1
NEW-NRS #2
NEW-KRS
NRS
SRS
DUA
KRS
NRS-SRS#2
NRS-SRS#1
G1
G3
G2
GIA
MIS
JUL
STJ
CEN
NORTHWEST LOOP
KEN
EAST LOOP
FRV
NWN
ZEN
URA
WAL
FIB
CENTER LOOP
RAY
HOM
SER
BRO
DCJ
MAT
PAR
CCA
LAF
SOUTH LOOP
AGN
NAJ
PLM
NORTHEAST LOOP
G


Inset Map
Northwest Loop
Northeast Loop
Center Loop
East Loop
South Loop
See Inset Map Above
Northwest Loop
Northeast Loop
Center Loop
East Loop
South Loop
PG&E 115kV
PG&E 230kV
PG&E 60kV
RAY
SRS
DUA
DVR
KRS
KEN
LAF
NRS
GIA
PLM
AGN
MIS
JUL
STJ
NAJ
CEN
ZEN
FRV
NWN
URA
FIB
WAL
CCA
COG
MAT
DCJ
BRO
HOM
SER
SSS
Legend
Generator
Combined Cycle
Gas Turbine
Internal Combustion
Photo Voltaic
Steam Turbine
Power Plant
Gas
Landfill Gas
Solar PV
Substation
PG&E
SVP
Transmission Lines
Overhead
Underground
230 kV
115 kV
60kV Loops
Northwest Loop
Northeast Loop
Center Loop
East Loop
South Loop
CEC Electric Service Area
Silicon Valley Power
Miles

E. A list of the customers connected to each of the five 60 kV loops in the SVP system.

SVP Loop Customers and Loading Peak - Substation:

Substation	Loop	Customer/Industry	Substation	Loop	Customer/Industry
Fairview	Center	Mfg1	Central	Northwest	Medical2
Fairview	Center	Datacenter1	Central	Northwest	Real Estate2
Fairview	Center	Datacenter2	Central	Northwest	Real Estate3
Fairview	Center	Datacenter3	Central	Northwest	Real Estate4
Fairview	Center	Datacenter4	Central	Northwest	Datacenter24
FIB	Center	Mfg2	Central	Northwest	Datacenter25
Lafayette	Center	Mfg3	Central	Northwest	R&D2
Lafayette	Center	Datacenter5	Central	Northwest	Real Estate5
Lafayette	Center	Mfg4	Central	Northwest	Real Estate6
Lafayette	Center	Mfg5	Central	Northwest	Healthcare equipment
Lafayette	Center	Datacenter6	Central	Northwest	Education13
Lafayette	Center	Mfg6	Central	Northwest	Semiconductor/R&D
NWN	Center	Datacenter7	JUL	Northwest	Datacenter26
Uranium	Center	Datacenter8	Mission	Northwest	Property Management7
Uranium	Center	R&D1	Mission	Northwest	Computer
Uranium	Center	Property	Mission	Northwest	Real Estate7
Uranium	Center	Datacenter9	Mission	Northwest	Datacenter27
Uranium	Center	Datacenter10	Mission	Northwest	Software1
Uranium	Center	Datacenter11	Mission	Northwest	Computer
Uranium	Center	Property	Mission	Northwest	Cyber Security 2
Uranium	Center	Education1	Mission	Northwest	Conventions 2
Uranium	Center	Education2	Mission	Northwest	Hotel3
Uranium	Center	Education3	Mission	Northwest	Medical3
Uranium	Center	Education4	Mission	Northwest	Cyber Security 3
Uranium	Center	Semiconductor/ Telecommunications	Mission	Northwest	Education14
Uranium	Center	Gaming/AI/ Semiconductors1	Mission	Northwest	Datacenter28
Uranium	Center	R&D/Mfg	Mission	Northwest	R&D3
Uranium	Center	Mfg7	Mission	Northwest	Semiconductor6
Walsh	Center	Semiconductor1	Mission	Northwest	Storage1
Walsh	Center	Gaming/AI/ Semiconductors2	Mission	Northwest	Entertainment3
Walsh	Center	Mfg8	Mission	Northwest	Property Management8
Walsh	Center	Gaming/AI/ Semiconductors3	Mission	Northwest	Medical4
Walsh	Center	Datacenter12	Mission	Northwest	Telecommunications2
Walsh	Center	Education5	Mission	Northwest	NFL5
Walsh	Center	Government1	Raymond	Northwest	Datacenter29
Walsh	Center	Government2	Raymond	Northwest	Datacenter30
Walsh	Center	Semiconductor2	Raymond	Northwest	Datacenter31
Walsh	Center	Semiconductor/R&D/M	Raymond	Northwest	Datacenter32
Walsh	Center	Mfg9	Raymond	Northwest	Telecommunications3
Walsh	Center	Telecommunications1	Raymond	Northwest	Datacenter33
Walsh	Center	Datacenter13	Raymond	Northwest	Gaming/AI/Semiconduct
Walsh	Center	Education6	Raymond	Northwest	Datacenter34
Walsh	Center	Datacenter14	Brokaw	South	Government3
Zeno	Center	Education7	Brokaw	South	Education15

Substation	Loop	Customer/Industry	Substation	Loop	Customer/Industry
Zeno	Center	Education8	Brokaw	South	Education16
Zeno	Center	Semiconductor3	Brokaw	South	Education17

Substation	Loop	Customer/Industry	Substation	Loop	Customer/Industry
Zeno	Center	Datacenter15	Brokaw	South	Real Estate8
Zeno	Center	Bio Tech 1	Brokaw	South	Design1
Zeno	Center	Semiconductor/ Telecommunications	Brokaw	South	Security 2
Zeno	Center	Semiconductor/R&D/M	Brokaw	South	Education18
Agnew	Northeast	Security1	Brokaw	South	Education19
Agnew	Northeast	Property	CCA	South	Mfg12
Agnew	Northeast	Property	DCJ	South	Datacenter35
Agnew	Northeast	Entertainment1	Homestead	South	Education20
Agnew	Northeast	NFL1	Homestead	South	Education21
Agnew	Northeast	Property	Homestead	South	Education22
Agnew	Northeast	Entertainment2	Homestead	South	Education23
Agnew	Northeast	Hotel1	Homestead	South	Education24
Agnew	Northeast	Datacenter18	Homestead	South	Education25
Agnew	Northeast	Medical1	Homestead	South	Education26
Agnew	Northeast	Mfg10	Homestead	South	Healthcare1
Agnew	Northeast	Datacenter19	Homestead	South	Telecommunications4
Agnew	Northeast	Datacenter20	Homestead	South	Education27
Agnew	Northeast	Datacenter21	Homestead	South	Education28
Agnew	Northeast	Datacenter22	MAT	South	Datacenter36
Agnew	Northeast	Cyber Security 1	PRK	South	Datacenter37
Agnew	Northeast	Hotel2	Serra	South	Medical device
Agnew	Northeast	Property	Serra	South	Education29
NAJ	Northeast	Mfg11	Serra	South	Education30
Palm	Northeast	Datacenter/software/ cloud computing	Serra	South	Healthcare2
Palm	Northeast	NFL2	Serra	South	Healthcare3
Palm	Northeast	NFL3	Serra	South	Healthcare4
Palm	Northeast	NFL4	Serra	South	Healthcare5
Palm	Northeast	Education9	Kenneth	East	Datacenter16
Palm	Northeast	Education10	Kenneth	East	Datacenter17
Palm	Northeast	Conventions 1	Kenneth	East	Gaming/AI/Semiconductors4
Palm	Northeast	Education11			
Palm	Northeast	Semiconductor4			
Palm	Northeast	Datacenter23			
Palm	Northeast	Education12			
Palm	Northeast	Real Estate1			
Palm	Northeast	Network hardware1			
Palm	Northeast	Semiconductor5			
Palm	Northeast	Computer hardware/software 1			

SVP Loop Customers and Loading Peak - Loop:

Center 141MW	East Loop 15MW	Northeast Loop 28MW	Northwest Loop 112MW	South Loop 65MW
Mfg1	Datacenter16	Security1	Medical2	Government3
Datacenter1	Datacenter17	Property Management3	Real Estate2	Education15
Datacenter2	Gaming/AI/Semiconduct	Property Management4	Real Estate3	Education16
Datacenter3		Entertainment1	Real Estate4	Education17
Datacenter4		NFL1	Datacenter24	Real Estate8
Mfg2		Property Management5	Datacenter25	Design1
Mfg3		Entertainment2	R&D2	Security 2
Datacenter5		Hotel1	Real Estate5	Education18
Mfg4		Datacenter18	Real Estate6	Education19
Mfg5		Medical1	Healthcare equipment	Mfg12
Datacenter6		Mfg10	Education13	Datacenter35
Mfg6		Datacenter19	Semiconductor/R&D	Education20
Datacenter7		Datacenter20	Datacenter26	Education21
Datacenter8		Datacenter21	Property Management7	Education22
R&D1		Datacenter22	Computer	Education23
Property Management1		Cyber Security 1	Real Estate7	Education24
Datacenter9		Hotel2	Datacenter27	Education25
Datacenter10		Property Management6	Software1	Education26
Datacenter11		Mfg11	Computer	Healthcare1
Property Management2		Datacenter/software/cloud	Cyber Security 2	Telecommunicatio
Education1		NFL2	Conventions 2	Education27
Education2		NFL3	Hotel3	Education28
Education3		NFL4	Medical3	Datacenter36
Education4		Education9	Cyber Security 3	Datacenter37
Semiconductor/Telecommunic		Education10	Education14	Medical device
Gaming/AI/Semiconductors1		Conventions 1	Datacenter28	Education29
R&D/Mfg		Education11	R&D3	Education30
Mfg7		Semiconductor4	Semiconductor6	Healthcare2
Semiconductor1		Datacenter23	Storage1	Healthcare3
Gaming/AI/Semiconductors2		Education12	Entertainment3	Healthcare4
Mfg8		Real Estate1	Property Management8	Healthcare5
Gaming/AI/Semiconductors3		Network hardware1	Medical4	
Datacenter12		Semiconductor5	Telecommunications2	
Education5		Computer hardware/software 1	NFL5	

Center 141MW	East Loop 15MW	Northeast Loop 28MW	Northwest Loop 112MW	South Loop 65MW
Government1			Datacenter29	
Government2			Datacenter30	
Semiconductor2			Datacenter31	
Semiconductor/R&D/Mfg			Datacenter32	
Mfg9			Telecommunications3	
Telecommunications1			Datacenter33	
Datacenter13			Gaming/AI/Semiconductor	
Education6			Datacenter34	
Datacenter14				
Education7				
Education8				
Semiconductor3				
Datacenter15				
Bio Tech 1				
Semiconductor/Telecommunic				
Semiconductor/R&D/Mfg				

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Appendix C:

Renewable Diesel and Natural Gas Supplemental Information

Appendix C: Renewable Diesel and Natural Gas Supplemental Information

Renewable Diesel

Introduction

Staff has researched the difference in cost, the production, supply, and emissions of renewable diesel in place of conventional, petroleum diesel for the emergency backup generators proposed for this project. Renewable diesel fuel supply is increasing year-by-year and limited emissions data indicate that greenhouse gas (GHG) emissions would be reduced if the ultra-low sulfur diesel (ULSD) fuel proposed for this facility is replaced with renewable diesel.

On July 31, 2013, the State Air Resources Board (CARB) and the State Water Resources Control Board issued a joint statement declaring that renewable diesel is fully equivalent to conventional low-sulfur diesel for sale in California.[1] Renewable diesel and CARB diesel (called ULSD below) both meet the same definition of "hydrocarbon oil" and American Society of Testing and Materials (ASTM) specification ASTM D975-12a. The joint statement states that renewable diesel is considered by these agencies to be a "drop in" fuel and fully equivalent to one another. A table attached to this joint statement shows that renewable diesel has much lower sulfur content than CARB diesel, a higher cetane number (for improved auto-ignition), and a much lower total aromatic content.

Cost Difference Between Renewable Diesel and ULSD

As explained more fully below, renewable diesel is manufactured at industrial facilities, such as refineries, using high pressures and temperatures to convert feedstocks to the final product. Currently, the most likely source of renewable diesel that could substitute for ULSD is the Neste facility located in Singapore.

There is very little data available comparing the unsubsidized cost of renewable diesel to ULSD. A representative of Western States Oil Company[2], which is a distributor of Neste renewable diesel, indicated that federal and state subsidies that are only available for transportation uses "pretty much covers the differential cost," which he estimated to be around $2.50 to $3.00 per gallon. In addition, transportation fuels are subject to approximately $0.66 per gallon in road taxes, and for a stationary source to avoid these taxes, the fuel supplier must dye the fuel red to distinguish it as a non-taxed use. Staff at the US Environmental Protection Agency (U.S. EPA) confirmed that federal tax credits are only available for transportation fuel uses at this time and that it would take an act

1 Letter from Air Resources Board, signed by Ricard Corey, Executive Officer of CARB and Tom Howard, Executive Director of SWRCB, dated July 31, 2013. Link: https://ww2.arb.ca.gov/resources/documents/renewable-diesel-joint-statement

2 Email exchanges of information occurred by phone and email on June 22 and June 24, 2020, between Gerry Bemis of CEC staff and Bob Brown of Western State Oil (TN 233855).

of congress to extend them to stationary source use.[3] In addition, CARB staff confirmed that credits issued under the state's Low Carbon Fuel Standard (LCFS) regulation (California Code of Regulations, Title 17, sec. 95480 et. seq) are only available for transportation uses.[4]

CARB initially approved the LCFS regulation in 2009 with the operative date beginning on January 1, 2011. CARB approved some amendments to the LCFS in December 2011, which became operative on January 1, 2013. In September 2015, CARB approved the re-adoption of the LCFS, which became operative on January 1, 2016, to address procedural deficiencies in the way the original regulation was adopted.

Due to the complexity of the LCFS program, CARB staff have indicated that it was more likely CARB would establish a parallel program for stationary uses rather than to expand the existing LCFS Program.

The applicant estimated the worst-case annual amount of petroleum diesel fuel needed for readiness testing and maintenance activities to be approximately 421,740 gallons per year of ULSD, assuming each generator is tested at full load for a maximum of 50 hours per year[5]. However, the applicant is proposing an annual limit of 35 hours of readiness testing and maintenance per year per generator. Therefore, the annual amount of petroleum diesel fuel needed would be prorated to 295,218 gallons. If the cost of renewable diesel is $3.00 per gallon more than ULSD, this equates to an annual increase in fuel cost of about $886,000 per year.[6] For comparison purposes, the cost of providing electricity to the CA3 data center (project) is estimated to be about $87 million dollars per year.[7]

Production of Renewable Diesel

Almost all renewable diesel fuel currently used in California is produced in Singapore by Neste, using a patented vegetable oil refining process[8]. Chemically, the production

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3 Information exchanges occurred by email between Gerry Bemis of CEC staff and Paul Michiele, Fuel Center Director, Office of Transportation and Air Quality, US EPA. These emails were dated July 6 and 7, 2020 (TN 234353 in the Great Oaks South Data Center proceeding).
4 Information exchange occurred by email between Gerry Bemis of CEC staff and Rachel Connors of ARB staff on July 17, 2020 (TN 235915 in the Great Oaks South Data Center proceeding).
5 VDC CA3BGF SPPE Application Part II (TN 237423), dated April 12, 2021. Available online at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=237423&DocumentContentId=70609
6 Computed from 295,218 gallons/yr. x $3.00/gallon = ~$886,000/yr.
7 Computed assuming a maximum data center occupancy and cooling load equal to 96 MW and 8,760 hours per year, or 840,960,000 kWh/yr. x $0.173 per kWh (PG&E's E-20P rate) x 0.60 (assumed occupancy rate) = ~$87 million per year. This is likely an overstatement of annual electricity procurement costs because the cooling portion of the electricity demand is based on the hottest day of the year.
8 Vegetable oil refining is a process to transform vegetable oil into biofuel by hydrocracking or hydrogenation. Hydrocracking breaks big molecules into smaller ones using hydrogen while hydrogenation adds hydrogen to molecules. Diesel fuel produced from these sources is known as *green diesel* or *renewable diesel*.

process entails direct catalytic hydrodeoxygenation[9] of plant oils, which are triglycerides[10], into the corresponding alkanes[11] and propane[12]. The glycerol chain of the triglyceride is hydrogenated to propane.

Thus, renewable diesel is made in an industrial facility that can accommodate the high temperatures and pressures needed to manufacture it.

Adequacy of Renewable Diesel Supply

Currently, renewable diesel is used mostly in mobile source applications in California. This use is supported by both the federal and state credits discussed above that are only available to transportation uses of renewable diesel. As explained above, these credits currently are high enough to cover the increased price of renewable diesel over ULSD for those uses that qualify for these credits.

Renewable diesel produced by Neste and ULSD are both available from a terminal located near the proposed project. The distributor is Western States Oil Company, located at 1790 South 10th Street, San Jose. A representative of this company indicated that they could easily supply one million gallons of renewable diesel per year. It is located approximately 7.5 miles southeast of the project's proposed location, and the drive time is typically less than 20 minutes.

CARB began reporting the consumption of renewable diesel in 2011. Annual sales volumes have grown from approximately 1.8 million gallons sold in 2011 to 618 million gallons sold in 2019. The annual consumption of ULSD for the project for readiness testing and maintenance is estimated to be about 295,218 gallons. If this were replaced with renewable diesel, this level of demand would be about 0.05 percent of renewable diesel consumption in 2019. Thus, if the project used renewable diesel in place of ULSD, there would be little change in the annual consumption of renewable diesel in California and the current supply should be adequate. See **Figure D-1** for annual sales of renewable diesel in California from 2011 to 2019.

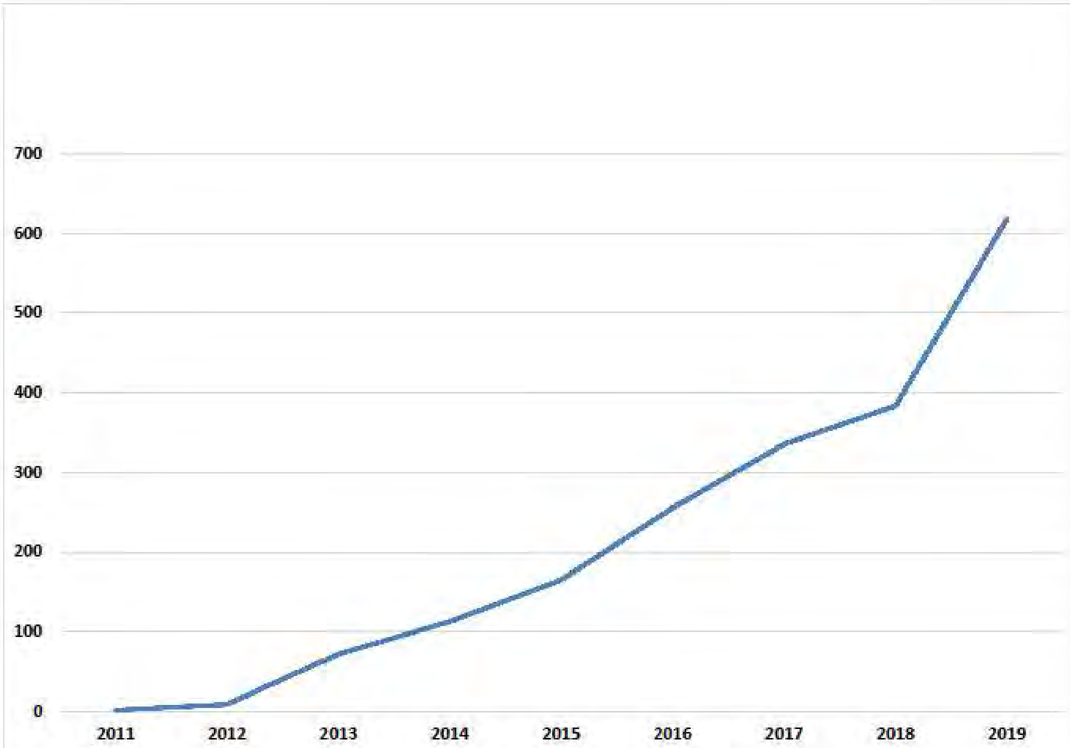
9 Hydrodeoxygenation (HDO) is a hydrogenolysis process for removing oxygen from oxygen containing compounds.

10 A triglyceride is an ester derived from glycerol and three fatty acids. Triglycerides are the main constituents of body fat in humans and other vertebrates, as well as vegetable fat.

11 An alkane consists of hydrogen and carbon atoms arranged in a structure in which all the carbon-carbon bonds are single.

12 Propane is a three-carbon alkane with the molecular formula C3H8. It is a by-product of natural gas process and petroleum refining and is commonly used as a fuel.

FIGURE D-1 CALIFORNIA'S ANNUAL SALES OF RENEWABLE DIESEL (MILLIONS OF GALLONS)



Renewable Diesel Emissions Compared to ULSD

Previous limited test results for motor vehicle engines show renewable diesel would have lower criteria air pollutants emissions, GHG emissions (over the full fuel-cycle), and toxics substance emissions than conventional ULSD. However, the previously tested engines did not have selective catalytic reduction (SCR) or diesel particulate filter (DPF) exhaust aftertreatment systems. CARB's most recent testing on new technology diesel engines (NTDE) with SCR and DPF shows no statistically significant differences in oxides of nitrogen (NOx), particulate matter (PM), and total hydrocarbon emissions, but lower carbon monoxide (CO) and carbon dioxide (CO_2) emissions using renewable diesel compared to CARB reference fuel. This should be confirmed with testing under controlled conditions in the size of engine proposed for this facility and using the same source test protocol used for engine certification.

Criteria Air Pollutant, Carbon Dioxide, and Fuel Use Test Results

CARB has conducted testing to evaluate emissions from the use of renewable diesel/biodiesel in one on-road and one off-road NTDE with SCR and DPF exhaust after treatment systems, and one off-road non-NTDE (legacy engine) without DPF and SCR.[13]

[13] Low Emission Diesel (LED) Study: Biodiesel and Renewable Diesel Emissions in Legacy and New Technology Diesel Engines, Final Report – November 2021. Available Online at: https://ww2.arb.ca.gov/resources/documents/low-emission-diesel-led-study-biodiesel-and-renewable-diesel-emissions-legacy. Accessed December 2021.

The emissions and performance effects of three renewable diesel/biodiesel blends – 100 percent renewable diesel (R100), 65 percent renewable diesel/35 percent biodiesel (R65/B35), and 50 percent renewable diesel/50 percent biodiesel (R50/B50) – were tested in each engine against a petroleum-based CARB reference fuel (CARB reference fuel).

Table D-1 summarizes the test results comparing R100 and CARB reference fuel from CARB's report.

For the off-road legacy engine (115 horsepower [hp] 2009 John Deere 4045HF285, without DPF and SCR), test results are consistent with previous observations. R100 showed statistically significant NOx reduction of 5.4 percent using the Non-Road Transient Cycle (NRTC) for testing and 4.9 percent using the five-mode D2 ISO 8718 steady state cycle (D2 cycle) for testing compared to CARB reference diesel. Emissions of PM decrease by 38 percent using the NRTC and 27 percent using the D2 cycle. Total Hydrocarbon (THC) emissions showed significant decreases (45 percent using the NRTC and 35 percent using the D2 cycle) using R100 compared to CARB reference diesel. Emissions of CO showed statistically significant decreases (22 percent using the NRTC and 14 percent using the D2 cycle) using R100 compared to CARB reference diesel. Emissions of CO_2 showed statistically significant reductions (4.1 percent using the NRTC and 4.6 percent using the D2 cycle) using R100 compared to CARB reference diesel. Brake Specific Fuel Consumption (BSFC), measured in gallons/bhp-hr, showed statistically significant increases of 3.5 percent for R100 using the NRTC. For the D2 cycle, there was no statistically significant change in BSFC for R100. Total particle number ([TPN] greater than 3 nm in diameter) and solid particle number ([SPN] greater than 23 nm in diameter) emissions show reductions for R100, except for the TPN tested in the D2 cycle that also showed a relatively large measurement variability.

For the on-road NTDE (450 hp 2019 Cummins C-15, with DPF and SCR), no statistically significant NOx emissions differences were found between the CARB reference fuel and R100. Emissions of PM of the on-road NTDE are low and near background levels. PM emissions observed for the CARB reference fuel and R100 did not show statistically significant differences. Emissions of THC were near or below background values. With the Federal Test Procedure (FTP), R100 showed no statistically significant difference in THC emissions relative to the CARB reference fuel. With the steady state Ramped Modal Cycles (RMC), THC emissions levels were below the background levels for all tests, and hence there were no measurable THC emissions. Emissions of CO from the FTP testing showed no statistically significant changes, but the RMC testing showed a slight reduction of 5 percent with R100. Emissions of CO_2 showed statistically significant decreases (3.2 percent using the FTP and 2.9 percent using the RMC) using R100 compared to CARB reference diesel. BSFC showed statistically significant increases (4.8 percent using the FTP and 5.1 percent using the RMC) using R100 compared to CARB reference diesel. Emissions of TPN show reductions (16 percent using the FTP and 14 percent using the RMC) for R100. Emissions of SPN also show reductions (22 percent using the FTP and 19 percent using the RMC) for R100.

TABLE D-1 COMPARISON OF TEST RESULTS FOR R100 AND CARB REFERENCE FUEL

	Percent Difference Comparing R100 and CARB Reference Fuel		
	Off-Road Legacy Engine	**On-Road New Technology Diesel Engine (NTDE)**	**Off-Road NTDE**
NOx	-5.4 (NRTC), -4.9 (D2 cycle)	No Statistically Significant Difference	No Statistically Significant Difference
PM	-38 (NRTC), -27 (D2 cycle)	No Statistically Significant Difference	No Statistically Significant Difference
Total Hydrocarbon (THC)	-45 (NRTC), -35 (D2 cycle)	No Statistically Significant Difference	No Statistically Significant Difference
CO	-22 (NRTC), -14 (D2 cycle)	No Statistically Significant Difference (FTP), -5 (RMC)	-44 (NRTC), Below Background Levels (C1 cycle)
CO_2	-4.1 (NRTC), -4.6 (D2 cycle)	-3.2 (FTP), -2.9 (RMC)	-3.8 (NRTC), -3.0 (C1 cycle)
Brake Specific Fuel Consumption (BSFC)	+3.5 (NRTC), No Statistically Significant Difference (D2 cycle)	+4.8 (FTP), +5.1 (RMC)	+4.1 (NRTC), +5.0 (C1 cycle)
Total Particle Number (TPN) Emissions	-16 (NRTC), No Statistically Significant Difference (D2 cycle)	-16 (FTP), -14 (RMC)	Not Tested
Solid Particle Number (SPN) Emissions	-19 (NRTC), -21 (D2 cycle)	-22 (FTP), -19 (RMC)	Not Tested

Source: See footnote 13.

For the off-road NTDE (225 hp 2018 Caterpillar C7.1 ACERT, with DPF and SCR), NOx emissions showed no statistically significant differences between the CARB reference fuel and R100. Emissions of PM were more than a factor of 30 below the Tier 4 PM standard of 0.015 g/bhp-hr in that size category. No statistically significant differences in PM emissions were seen between different fuels. Emissions of THC were below the background levels for both the NRTC and eight-mode C1 ISO 8718 steady state cycle (C1) cycles and for all fuels. Therefore, there were no statistically significant differences in THC emissions relative to the CARB reference fuel. Emissions of CO from the NRTC testing for R100 were 44 percent lower than those for the CARB reference fuel. With the C1 cycle testing, CO emissions were near or below background levels for all tests. Emissions of CO_2 showed statistically significant reductions (3.8 percent using the NRTC and 3.0 percent using the C1 cycle) using R100 compared to CARB reference diesel. BSFC showed statistically significant increases (4.1 percent using the NRTC and 5.0 percent using the C1 cycle) using R100 compared to CARB reference diesel. Emissions of TPN and SPN were not tested for the off-road NTDE.

In summary, test results for the off-road legacy engine are consistent with previous observations, which showed that renewable diesel is expected to reduce criteria air pollutant and tailpipe CO_2 emissions from levels expected for ULSD. However, for the on-road NTDE and off-road NTDE engines, which were equipped with DPF and SCR, no statistically significant differences were found in the NOx, PM, and THC emissions using renewable diesel and CARB reference diesel. Emissions of CO for the on-road NTDE and off-road NTDE engines showed reduction using the renewable diesel for some testing cycles. Emissions of CO_2 for the on-road NTDE and off-road NTDE engines also showed reduction using the renewable diesel. Fuel consumption (shown as BSFC) is increased for the renewable diesel for all three engines tested, which is likely due to its slightly lower energy density per gallon, around 4 to 10 percent lower than ULSD. TEmissions of TPN and SPN are generally reduced using renewable diesel for the off-road legacy engine and the on-road NTDE.

The Caterpillar 3516E engines proposed by the applicant to be used at the project for the backup generators are rated at a nominal 2.75 megawatt (MW) (4,043 hp), much larger than the engines tested in the report cited above. The Caterpillar 3516E engines proposed for the project would be equipped with SCR and DPF to achieve compliance with Tier 4 emission standards. Test results for the new technology diesel engines would be more comparable to the proposed engines than the legacy engine. Ideally, tests should be performed on the proposed engine using renewable diesel compared with ULSD to have a better understanding of the amount of reduction in emissions expected using renewable diesel in place of ULSD. However, based upon testing to date, criteria air pollutant emissions should be significantly reduced when replacing ULSD with renewable diesel.

Toxics Emissions Test Results. Toxics emissions were tested previously on a 475 hp 2000 Caterpillar C-15 engine in the Freightliner chassis tested on a heavy-duty vehicle dynamometer.[14] The previous test data show good potential for reducing toxics substance emissions by substituting renewable diesel for ULSD. However, the results obtained for increased acetone emissions may need further study and analysis. In addition, the tested engine did not have SCR and DPF, and, therefore, it may not be comparable to the proposed engines.

Toxics emissions were not tested for CARB's most recent report. Based on the test results for total hydrocarbon emissions and PM emissions for the NTDE (shown in **Table D-1**), staff expects no statistically significant difference in toxics emissions using renewable diesel compared to ULSD.

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14 CARB Assessment of the Emissions from the Use of Biodiesel as a Motor Vehicle Fuel in California—Biodiesel Characterization and NOx Mitigation Study (October 2011); Appendix G.

Fuel-cycle Greenhouse Gas Emissions Comparison

As shown in **Table D-1** above, renewable diesel used in place of ULSD can reduce CO_2 tailpipe emissions approximately 3 to 4 percent. However, renewable diesel is produced with a fuel-cycle that is a far lower carbon intensity (CI) than ULSD. To have a more complete understanding of the impact of replacing ULSD with renewable diesel, it is necessary to examine the full fuel-cycle of each fuel from origin to use. This is because GHGs have a global impact rather than a local impact.

To compute full fuel-cycle GHG emissions, a model called GREET[15] is commonly used to evaluate full fuel-cycle GHG emissions for transportation. Although staff has not computed fuel-cycle emissions using GREET, we can estimate the relative change in GHG emissions using CI values from the LCFS program. Although the use of renewable diesel does not qualify for obtaining credits from LCFS as explained above, CI values obtained from that program[16] can be used to estimate the expected GHG emissions reductions associated with switching from ULSD to renewable diesel in this project. CARB staff use a version of GREET called CA-GREET to compute CI values for the LCFS program.[17]

The data shown below in **Table D-2** are CARB-estimated values for Neste reformulated diesel supplied from various feedstocks with the renewable diesel produced at the Neste refinery located in Singapore. These CI values include the feedstock and transport to California via oceangoing tanker. They apparently do not include the consumption of the fuel. Combining the CI of the fuel-cycle with the reduced tailpipe emissions from **Table D-1** provides an approximate estimate of the full fuel-cycle benefit of replacing ULSD with renewable diesel. For comparison purposes, the CI for ULSD/CARB diesel has a value of 100.45.

15 Greenhouse gases, Regulated Emissions, and Energy use in Transportation. Available from Argonne National Labs. From the Arbonne web site: Analysis of transportation systems on a life-cycle basis permits us to better understand the breadth and magnitude of impacts produced when vehicle systems are operated on different fuels or energy options like electricity or hydrogen. Such detailed analysis also provides the granularity needed to investigate policy implications, set R&D goals, and perform follow-on impact and policy assessments. US Department Energy's Office of Energy Efficiency and Renewable Energy, Systems Assessment Group in Argonne's Energy Systems Division has been developing the GREET model to provide a common, transparent platform for lifecycle analysis (LCA) of alternative combinations of vehicle and fuel technologies.Vehicle technologies include conventional internal combustion engines, hybrid electric systems, battery electric vehicles, and fuel cell electric vehicles. Fuel/energy options include petroleum fuels, natural gas-based fuels, biofuels, hydrogen, and electricity. LCAs conducted with the GREET platform permit consideration of a host of different fuel production, and vehicle material and production pathways, as well as alternative vehicle utilization assumptions. GREET includes all transportation modes – on-road vehicles, aircraft, marine vessels, and rail (to be added in a new GREET release). The Systems Assessment Group has conducted various LCAs of vehicle/fuel systems for DOE and other agencies. There are more than 20,000 registered GREET users.

16 https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities

17 https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities.

TABLE D-2 CARBON INTENSITY VALUES COMPUTED FROM CA-GREET MODEL		
Feedstock	**Carbon intensity (CI)**	**Percent Reduction of Renewable Diesel From ULSD (%)**
Asian-sourced used cooking oil	16.89	-83
Globally averaged used cooking oil	25.61	-75
Southeast Asian fish oil	33.08	-67
North American tallow	34.19	-66
New Zealand tallow	34.81	-65
Australian tallow	36.83	-63
Midwest corn oil	37.39	-63
Globally averaged tallow	39.06	-61
ULSD/CARB Diesel	100.45	0

Thus, the 61 to 83 percent reduction in CI values from **Table D-2** should be combined with results in **Table D-1** above. However, it can be seen that using renewable diesel in place of ULSD would greatly reduce the project's full fuel-cycle GHG emissions associated with operating diesel-fueled equipment during the construction period and onsite fuel consumption during the operations period. However, renewable diesel still has some carbon associated with the fuel-cycle, as evidenced by the CI values in **Table D-2** not being zero, so additional measures would be needed before the project could be considered a carbon-free facility.

Natural Gas Internal Combustion Engines

Introduction

Staff has researched the difference in cost, supply, and emissions of using natural-gas-fueled internal combustion engines (ICEs) in place of conventional petroleum diesel for the emergency backup generators proposed for this project. Currently, there is limited information available on the fuel supply reliability of natural gas delivered to the site by pipeline versus the reliability of delivering liquid petroleum diesel by tanker truck to the site. However, most backup generators currently in place use diesel. A nationwide survey in 2016 revealed that 85 percent of the emergency backup generation was served by diesel, while 10 percent was served by natural gas and the remainder by propane.[18]

Cost Difference Between Natural Gas and Petroleum Diesel Emergency Backup Generators

The reliability of a system is an important consideration when selecting an emergency backup generator. But cost is important as well. Many factors contribute to the life-cycle costs of a backup system, such as equipment, maintenance, and fuel costs.

18 National Renewable Energy Laboratory report. A Comparison of Fuel Choices for Backup Generators; https://www.nrel.gov/docs/fy19osti/72509.pdf.

Both, natural gas ICEs and diesel engines are reciprocating engines. They are available in sizes up to 18 MW. The fast start-up capability of reciprocating engines allows for the timely resumption of the system following a maintenance procedure. In peaking or emergency power applications, reciprocating engines can quickly supply electricity on demand. The annual energy cost ($/MMBtu) for natural gas fuel is lower than conventional diesel. But diesel generators generally have a lower component cost than ICEs. It is notable that improvements in ICEs and recently promulgated air quality regulations have reduced some of the cost advantages of diesel systems.[19]

The size of the engines can impact operating cost. If switching from one generating technology to another requires more engines to deliver the same total MW capacity, the repair and maintenance frequency and testing requirements could increase, which may result in an increase in associated costs.

Space Needs

Diesel-fueled emergency backup generators are typically built on a rack over their fuel supply tank, requiring space between each generator and a staircase and service deck at the elevation of the diesel engine. Based on air quality modeling files, staff estimated the footprint of the 44 engines proposed at the project site as approximately 0.48 acres for 121 MW (peak power) or approximately 252 MW per acre.

Enchanted Rock, a vendor for natural gas ICEs, provided a drawing showing how they would arrange their engines at a typical site. The result was an approximate capacity of 78 MW per acre.

Natural Gas ICE Emissions Compared to Petroleum Diesel

Criteria Air Pollutant and Carbon Dioxide Emissions Comparison

Staff compared criteria air pollutant emissions and carbon dioxide emissions of natural gas ICEs against the proposed diesel-fired engines for the project. The proposed 44, 2.75-MW engines would be equipped with SCR and DPF to achieve compliance with Tier 4 emission standards. However, it takes time for the SCR to reach the activation temperature and become fully effective in controlling NOx emissions. Depending on load, the SCR would be expected to kick on within 15 minutes.

Information for the natural gas ICEs is primarily based on the data provided for the Small Power Plant Exemption application for the San Jose Data Center (Jacobs 2021s). The natural gas ICEs for the San Jose Data Center would be equipped with a 3-way catalyst system to reduce emissions of NOx, CO, volatile organic compounds (VOC), and air toxics. The applicant for the San Jose Data Center also assumed 15 minutes of operation with uncontrolled emissions and 45 minutes of operation with controlled emissions to estimate hourly emissions (Jacobs 2021o).

Table D-3 compares the emission factors in pounds per megawatt-hour (lbs/MWe-hr) for the proposed diesel engines at the project and those for the natural gas ICEs proposed at the San Jose Data Center. Staff assumed the same 15-minute warm up period for the SCRs of the diesel engines and the 3-way catalyst system for the natural gas ICEs.

TABLE D-3 CRITERIA AIR POLLUTANT EMISSIONS NATURAL GAS ICE VERSUS PETROLEUM DIESEL ICE

	Units	Proposed Petroleum Diesel Engine	Natural Gas ICE	Difference	Percent Difference (%)
NOx	Lbs/MWe-hr	4.89	0.09	-4.81	-98.2
PM	Lbs/MWe-hr	0.06	0.01	-0.05	-83.1
VOC	Lbs/MWe-hr	0.19	0.10	-0.09	-45.9
CO	Lbs/MWe-hr	1.89	1.68	-0.21	-11.3
SO_2	Lbs/MWe-hr	0.01	0.009	-0.003	-25.4
CO_2	Lbs/MWe-hr	1,556	1,440	-116	-7.4

Sources: DayZenLLC 2021b, Jacobs 2021s, and Energy Commission staff analysis

Toxics Emissions

Staff is not able to find data comparing toxics emissions of natural gas ICEs with those for diesel engines. However, these are expected to be reduced due to the reductions reported above for VOCs and PM.

Fuel-cycle Greenhouse Gas Emissions Comparison

As mentioned above, to compute full fuel-cycle GHG emissions, the GREET model is commonly used to evaluate full fuel-cycle GHG emissions for transportation. Although staff has not computed fuel-cycle emissions using GREET, we can estimate the relative change in GHG emissions using carbon intensity (CI) values from the LCFS program. GREET results should be combined with stack emissions shown above to get an understanding of the relative GHG emissions associated with both natural gas ICEs and petroleum diesel ICEs.

CI values indicate that natural gas ICEs fueled with pipeline natural gas produced from fossil feedstocks have a CI about 20 percent lower than petroleum diesel, as shown in the first three rows of **Table D-4**, compared to petroleum diesel, which is shown at the bottom of the table.

Natural gas feedstocks from renewable feedstocks have a CI that is much lower, with most of the renewable feedstocks associated with a net reduction in fuel-cycle carbon emissions. In other words, these feedstock options act as a way of capturing GHG emissions that would otherwise escape. Negative values in **Table D-4** below reflect this outcome. Converting these feedstocks into a fuel would provide substantial societal benefits since the feedstock would otherwise be contributing directly to global warming.

A recent study done for the State Water Resources Control Board by Carollo Engineers[19] and published in June 2019 illustrates how food wastes can be converted to renewable natural gas and achieve significant GHG emissions reductions. Through the co-digestion of food waste diverted from landfills and processed in anaerobic digesters, municipal wastewater treatment plants have the potential produce, capture, and make beneficial use of biogas, which is a renewable source of methane.

The Carollo report stated that landfills accounted for approximately 8,560,000 metric tons of carbon dioxide equivalent (MT CO_2e) emissions as methane in 2016, or about 22 percent of statewide methane emissions. They estimated that by the year 2030, approximately 3.4 million short wet tons of food waste could be diverted from landfills to municipal wastewater treatment plants for co-digestion and processing into renewable natural gas for beneficial use. This would reduce methane emissions from landfills and reduce GHG emissions from this sector by up to approximately 2.4 $MMTCO_2e$.

TABLE D-4 CARBON INTENSITY VALUES COMPUTED FROM CA-GREET MODEL

Feedstock	Carbon intensity (CI)	Percent Reduction of Natural Gas ICEs From Petroleum Diesel (%)
PG&E Gas	80.59	-19.7
Average Pipeline Gas	79.21	-21.1
SoCal Gas	78.21	-22.1
Landfill Gas	-5.28 to 62.30	-105 to -38
Food Wastes	-22.93	-122
Dairy Manure	-377.83 to -192.49	-476 to -292
Renewable Natural Gas	-630.72 to -151.41	-728 to -251
ULSD/CARB Diesel	100.45	0

While using pipeline natural gas in place of ULSD would reduce fuel-cycle GHG emissions approximately 20 percent, a 2018 report funded by the Public Utilities Commission (CPUC) evaluated issues with injecting fuels other than natural gas into natural gas pipelines. The report was titled: *Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxane Specifications -- An Independent Review of Scientific and Technical Information.*[20] Assembly Bill 1900 (Chapter 602, Statutes of 2012), which became operative beginning in 2013, required, among other things, that the CPUC review and upgrade as appropriate specifications for adding biogas to the state's existing natural gas pipeline system.

In 2006, the CPUC adopted Decision 06-09-039, which increased the specified minimum allowable biomethane heating value (HV) from 970 British Thermal Units per standard cubic foot of gas (BTU/scf) to 990 BTU/scf.

19 WRCB, Co-Digestion Capacity In California; Co-Digestion Capacity Analysis Prepared for the California State Water Resources Control Board under Agreement #17-014-240; https://www.waterboards.ca.gov/water_issues/programs/climate/docs/co_digestion/final_co_digestion_capacity_in_california_report_only.pdf; June 2019.
20 See: https://ccst.us/wp-content/uploads/2018biomethane.pdf

In 2014 the CPUC adopted Decision 14-01-034, which included additional gas quality specification requirements that biogas would need to meet before it could be added to natural gas pipelines, including a maximum siloxane content of 0.1 mg siloxane per cubic meter of gas (Si/m^3). This level was set to protect against equipment damage and catalyst poisoning.

The 2018 CPUC report recommends that CPUC conduct further work to determine the acceptability of allowing an HV as low as 970 BTU/scf, which is the value that was allowed before the 2006 CPUC decision to increase the HV to 990 BTU/scf.

The 2018 CPUC report stated that siloxanes are not expected to be present in dairy waste, agriculture waste, or forestry residues. It concluded that some sources are very unlikely to have siloxanes (e.g., dairies or agricultural waste) and that these sources could be held to a reduced and simplified verification regime.

Further work may be needed to integrate renewable natural gas into the existing natural gas pipeline system in a cost-effective manner.

Contracting to obtain rights for renewable gas would lead to greater GHG benefits. This can be accomplished simply by displacement if the issues identified above can be resolved, assuming that the location of the use of the renewable natural gas is different from the source of the renewable natural gas unless they are close enough together to use a dedicated pipeline.

As shown in **Table D-2**, *fossil* natural gas and some forms of renewable natural gas still has some carbon associated with the fuel cycle. These show up in the table for those fuels with a CI that is greater than zero. In these cases, additional measures could be needed before the project would be considered a carbon-free facility.

References

DayZenLLC 2021b – DayZenLLC (DayZenLLC). (TN 237381). VDC CA3BGF SPPE Application Part III, dated April 5, 2021. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-SPPE-01

Jacobs 2021o – Jacobs (Jacobs). (TN 239409). SJC Data Center SPPE Application Supplemental Filing Volume 1, dated August 20, 2021. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-SPPE-04

Jacobs 2021s – Jacobs (Jacobs). (TN 239413). SJC Data Center SPPE Application Supplemental Filing Appendix Air - Traffic, Part 1, dated August 20, 2021. Available online at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-SPPE-04

Appendix D:

Mailing List

Appendix D: Mailing List

The following is the mailing list for the San Jose Data Center project.

The following is a list of the State agencies that received State Clearinghouse notices and documents:

- California Air Resources Board (ARB)
- California Department of Conservation (DOC)
- California Department of Fish and Wildlife, Marin Region 7 (CDFW)
- California Department of Parks and Recreation
- California Department of Transportation, District 4 (DOT)
- California Department of Water Resources (DWR)
- California Energy Commission
- California Governor's Office of Emergency Services (OES)
- California Highway Patrol (CHP)
- California Natural Resources Agency
- California Public Utilities Commission (CPUC)
- California Regional Water Quality Control Board, San Francisco Bay Region 2 (RWQCB)
- California State Lands Commission (SLC)
- Department of Toxic Substances Control, Office of Historic Preservation
- San Francisco Bay Conservation and Development Commission (BCDC)
- State Water Resources Control Board, Division of Drinking Water
- State Water Resources Control Board, Division of Water Quality
- California Native American Heritage Commission (NAHC)
- California Department of Fish and Wildlife, Bay Delta Region 3 (CDFW)

Table E-1 presents the list of occupants and property owners contiguous to the project site.

Table E-2 presents the list of property owners within 1,000 feet of the project site and 500 feet of the project linears.

Table E-3 presents the list of agencies, including responsible and trustee agencies and libraries.

Table E-4 presents the list of interested parties including environmental justice and community-based organizations.

TABLE E-1 OWNERS AND OCCUPANTS OF PROPERTY CONTIGUOUS TO PROJECT SITE				
Name	**Address**	**City**	**State**	**Zip**
CITY OF SANTA CLARA	1500 WARBURTON AVE.	SANTA CLARA	CA	95050
PENINSULA CORRIDOR JOINT POWERS, BOARD	1250 SAN CARLOS AVE	SAN CARLOS	CA	94070
WALSH INVESTMENT PROPERTIES LLC	2630 WALSH AVE	SANTA CLARA	CA	95051
JJ & W-WALSH LLC	2490 CHARLESTON RD	MOUNTAIN VIEW	CA	94043

TABLE E-2 PROPERTY OWNERS WITHIN 1,000 FEET OF PROJECT SITE AND 500 FEET OF LINEARS				
Name	**Address**	**City**	**State**	**ZIP**
SANTA CLARA UNIFIED SCHOOL DISTRICT	1889 LAWRENCE ROAD	SANTA CLARA	CA	95051
ACHK ASSOCIATES LLC	2775 NORTHWESTERN PKWY	SANTA CLARA	CA	95051
	465 CALIFORNIA ST	SAN FRANCISCO	CA	94104
PEAK REALTY INVESTMENT LLC	2625 WALSH AVE	SANTA CLARA	CA	95051
KEYPOINT CREDIT UNION	2805 BOWERS AVE	SANTA CLARA	CA	95051
IPX WALSH BOWERS INVESTORS LP	225 W SANTA CLARA ST 12TH FL	SAN JOSE	CA	95113
SCPO LLC	5674 SONOMA DR	PLEASANTON	CA	94566
JST COMMERCIAL PROP LLC	2050 SEABROOK CT	REDWOOD CITY	CA	94065
LBA RV-COMPANY I LLC	PO BOX 847	CARLSBAD	CA	92018
SPTC ESMT MURRA N, U	1500 SANSOME ST	SAN FRANCISCO	CA	94111
MEAD VENTURES INC	10920 PRIETA CT,	SAN JOSE	CA	95127
SILVER HORSE EQUITIES LLC	265 SUNSET DR	WESTLAKE VILLAGE	CA	91361
PROLOGIS EXCHANGE 2800 MEAD AVENUE LLC	1800 WAZEE ST	DENVER	CO	80202
BODO, JOSEPH; BODO, VALERIE	2695 WALSH AVE	SANTA CLARA	CA	95051
STEPHENS & STEPHENS	2590 WALSH AVE	SANTA CLARA	CA	95051
DIGITAL REALTY TRUST LP	16600 WOODRUFF AVE	BELLFLOWER	CA	90706
NVIDIA CORP	2788 SAN TOMAS EXPY	SANTA CLARA	CA	95051
CHUNYUAN PHOTONICS LLC	2701 NORTHWESTERN PKWY	SANTA CLARA	CA	95051
CHUNYUAN PHOTONICS LLC	2710 NORTHWESTERN DR	SANTA CLARA	CA	95051
VANTAGE DATA CENTERS 4 LLC; VANTAGE DATA CENTERS 3 LLC	2820 NORTHWESTERN PKWY	SANTA CLARA	CA	95051
VANTAGE DATA CENTERS 3 LLC	2880 NORTHWESTERN PKWY	SANTA CLARA	CA	95051

TABLE E-3 AGENCIES AND LIBRARIES							
FIRST NAME	**LAST NAME**	**TITLE**	**AGENCY**	**ADDRESS**	**CITY**	**STAT E**	**ZIP**
ARIANA	HUSAIN	PERMIT ENGINEER	BAY AREA AIR QUALITY MANAGEMENT DISTRICT	375 BEALE STREET, SUITE 600	SAN FRANCISCO	CA	94105
DR. STACY	SHERMAN	ACTING REGIONAL MANAGER	CA. DEPT. OF FISH AND WILDLIFE, BAY DELTA REGION (REGION 3)	2825 CORDELIA ROAD SUITE 100	FAIRFIELD	CA	94534
GERRY	HAAS	CONSERVATION PLANNER	SANTA CLARA VALLEY HABITAT AGENCY	535 ALKIRE AVENUE	MORGAN HILL	CA	95037
SIMON	BAKER	DIRECTOR, ENERGY DIVISION	CALIFORNIA PUBLIC UTILITIES COMMISSION	505 VAN NESS AVENUE	SAN FRANCISCO	CA	94102
RYAN	OLAH	DIVISION CHIEF	US FISH & WILDLIFE SERVICE, SACRAMENTO FISH & WILDLIFE OFFICE, COAST BAY DIVISION	2800 COTTAGE WAY RM W-2605	SACRAMENTO	CA	95825
KERRI	KISKO	ENVIRONMENTAL SCIENTIST	CALIFORNIA DEPARTMENT OF CONSERVATION	801 K STREET, MS 14-15	SACRAMENTO	CA	95814
LAURA	MIRANDA	COMMISSIONER	NATIVE AMERICAN HERITAGE COMMISSION	1550 HARBOR BLVD, SUITE 100	WEST SACRAMENTO	CA	95691
SYLVIA	FUNG	SUPERVISING TRANSPORTATON ENGINEER	IGR, CALTRANS, DISTRICT 4	P.O. BOX 23660	OAKLAND	CA	94623 -0660
KEITH	LICHTEN		SAN FRANCISCO BAY RWQCB, REGION 2	1515 CLAY SUITE 1400	OAKLAND	CA	94612
LORI	KOCH	ACTING CHIEF BERKELEY/HQ	DEPT. OF TOXIC SUBSTANCES CONTROL	700 HEINZ AVENUE SUITE 200	BERKELEY	CA	94710 -2721
			SAN FRANCISCO BAY CONSERVATION & DEVELOPMENT COMMISSION	375 BEALE STREET, SUITE 510	SAN FRANCISCO	CA	94105
BINAYA	SHRESTH A	SUBJECT MATTER EXPERT, PG&E	CALIFORNIA INDEPENDENT SYSTEM OPERATOR	250 OUTCROPPING WAY	FOLSOM	CA	95630
WADE	CROWFOO T	SECRETARY	NATURAL RESOURCES AGENCY	1416 NINTH STREET, SUITE 1311	SACRAMENTO	CA	95814
PHILLIP	CRADER	ASST. DEPUTY DIRECTOR	STATE WATER RESOURCES CONTROL BOARD, WATER QUALITY DIVISION	P.O. BOX 100	SACRAMENTO	CA	95812 -0100

TABLE E-3 AGENCIES AND LIBRARIES							
FIRST NAME	**LAST NAME**	**TITLE**	**AGENCY**	**ADDRESS**	**CITY**	**STAT E**	**ZIP**
ALYSON	AQUINO	SOIL CONVERSATIONIST	NATURAL RESOURCES CONSERVATION SERVICES	3585 GREENVILLE ROAD SUITE 2	LIVERMORE	CA	94550 -6707
KARLA	NEMETH	DIRECTOR	DEPARTMENT OF WATER RESOURCES	P.O. BOX 942836	SACRAMENTO	CA	94236 -0001
			COUNTY OF SANTA CLARA, OFFICE OF THE CLERK RECORDER	70 WEST HEDDING STREET	SAN JOSE	CA	95110
DENNIS	JANG	SUPERVISING AIR QUALITY ENGINEER	BAQMD, ENGINEERING DIVISION	375 BEALE STREET, SUITE 600	SAN FRANCISCO	CA	94105
PAMELA	LEONG	DIRECTOR, OFFICER	BAQMD, ENGINEERING DIVISION	375 BEALE STREET, SUITE 600	SAN FRANCISCO	CA	94105
REBECCA	FANCHER		CALIFORNIA AIR RESOURCES BOARD	1001 I ST	SACRAMENTO	CA	95814
COURTNEY	GRAHAM	MANAGER	CALIFORNIA AIR RESOURCES BOARD, ENFORCEMENT DIVISION	1001 I ST	SACRAMENTO	CA	95814
GLORIA	SCIARA	DEVELOPMENT REVIEW OFFICER	CITY OF SANTA CLARA PLANNING DIVISION	1500 WARBURTON AVENUE	SANTA CLARA	CA	95050
ROY	MOLSEED	SENIOR ENVIRONMENTAL PLANNER	SANTA CLARA VALLEY TRANSPORTATION AUTHORITY	3331 NORTH FIRST STREET	SAN JOSE	CA	95134 -1927
ARUNA	BODDUNA	ASSOCIATE TRANSPORTATION PLANNER	COUNTY OF SANTA CLARA ROADS AND AIRPORT DEPARTMENT	101 SKYPORT DRIVE	SAN JOSE	CA	95110
MARK	CONNOLL Y	PLANNER	SANTA CLARA COUNTY AIRPORT LAND USE COMMISSION	70 WEST HEDDING STREET; EAST WING, 7TH FLOOR	SAN JOSE	CA	95110
GWEN	GOODMA N	KEY CUSTOMER SERVICE REPRESENTATIVE	SILICON VALLEY POWER	1500 WARBURTON AVENUE	SANTA CLARA	CA	95050
KATHRIN	TURNER	ASSISTANT ENGINEER II	SANTA CLARA VALLEY WATER DISTRICT-- COMMUNITY PROJECTS REVIEW UNIT	5750 ALMADEN EXPRESSWAY	SAN JOSE	CA	95118

TABLE E-3 AGENCIES AND LIBRARIES							
FIRST NAME	**LAST NAME**	**TITLE**	**AGENCY**	**ADDRESS**	**CITY**	**STAT E**	**ZIP**
		STAFF LIAISON	HISTORICAL AND LANDMARKS COMMISSION	1500 WARBURTON AVENUE	SANTA CLARA	CA	95050
FREDERICK	CHUN	ASSOCIATE FIRE MARSHAL/HAZARDO US MATERIALS MANAGER	CITY OF SANTA CLARA--FIRE PREVENTION/HAZARDOUS MATERIALS	1675 LINCOLN STREET	SANTA CLARA	CA	95050 -4653
			SANTA CLARA FIRE STATION #2	1900 WALSH AVE	SANTA CLARA	CA	95050
RUBEN	TORRES	FIRE CHIEF	SANTA CLARA FIRE DEPARTMENT, FIRE STATION NO. 1 /FIRE ADMINISTRATION	777 BENTON STREET	SANTA CLARA	CA	95050
KEVIN	KEATING	ELECTRIC DIVISION MANAGER	SILICON VALLEY POWER (CITY OF SANTA CLARA)	1500 WARBURTON AVENUE	SANTA CLARA	CA	95050
KATHERINE	KENNEDY	AIRPORT PLANNER	FEDERAL AVIATION ADMINISTRATION (FAA)	1000 MARINA BOULEVARD, SUITE 220	BRISBANE	CA	94005
DREW	NIEMEYER	ADMINISTRATIVE OFFICES, AIRPORT DEPARTMENT	NORMAN Y. MINETA SAN JOSÉ INTERNATIONAL AIRPORT	1701 AIRPORT BOULEVARD, SUITE B-1130	SAN JOSE	CA	95110 -1206
		ENVIRONMENTAL REVIEW, PLANNING DIVISION	DEPARTMENT OF PLANNING, BUILDING, AND CODE ENFORCEMENT	200 E. SANTA CLARA STREET	SAN JOSE	CA	95113
CARY	GREENE	AIRPORT PLANNER	CITY OF SAN JOSE AIRPORT DEPARTMENT	1701 AIRPORT BOULEVARD, SUITE B-1130	SAN JOSE	CA	95510
			SAN FRANCISCO BAY-DELTA FISH AND WILDLIFE	650 CAPITOL MALL, SUITE 8-300	SACRAMENTO	CA	95814
Nicole	WAUGH		CEC - ENERGY LIBRARY	1516 9TH ST, MS 10	SACRAMENTO	CA	95814 -5504
			FRESNO COUNTY FREE LIBRARY	2420 MARIPOSA ST	FRESNO	CA	93721 -2204
			HUMBOLDT COUNTY MAIN LIBRARY	1313 3RD STREET	EUREKA	CA	95501 -0553

TABLE E-3 AGENCIES AND LIBRARIES							
FIRST NAME	**LAST NAME**	**TITLE**	**AGENCY**	**ADDRESS**	**CITY**	**STATE**	**ZIP**
		SERIALS DIVISION	LOS ANGELES PUBLIC LIBRARY	630 W 5TH ST	LOS ANGELES	CA	90071-2002
		SCIENCE & INDUSTRY DIV	SAN DIEGO PUBLIC LIBRARY	330 PARK BLVD	SAN DIEGO	CA	92101-6478
		GOVERNMENT INFORMATION CENTER	SAN FRANCISCO PUBLIC LIBRARY	100 LARKIN ST	SAN FRANCISCO	CA	94102-4733
		GOV PUBS	STANLEY MOSK LIBRARY & COURTS BLDG	914 CAPITOL MALL, 3RD Floor	SACRAMENTO	CA	95814-5512
		Librarian	Northside Branch Library	695 Moreland	Santa Clara	CA	95054-5134

TABLE E-4 INTERESTED PARTIES INCLUDING ENVIRONMENTAL JUSTICE AND COMMUNITY-BASED ORGANIZATIONS						
First Name	**Last Name**	**Organization**	**Address**	**City**	**State**	**Zip**
Carol	Zabin	Center for Labor Research and Education (Labor Center)	2521 Channing Way #5555	Berkeley	CA	94704
		Californians for Pesticide Reform (CPR)	2029 University Ave., Suite 200	Berkeley	CA	94704
Amy D.	Kyle	UC Berkeley, School of Public Health	140 Warren Hall	Berkeley	CA	94720
		Rising Sun Center For Opportunity	111 36th Street	Oakland	CA	94608
Brooks	Andrew	Association for Energy Affordability West	5900 Hollis Street, Suite R2	Emeryville	CA	94608
		San Mateo County Union Community Alliance (SMCUCA)	1153 Chess Dr.	Foster City	CA	94404
		Communities for a Better Environment	6325 Pacific Blvd. Ste 300	Huntington Park	CA	90255
LeVonne	Stone	Fort Ord Environmental Justice Network, Inc.	PO Box 361	Marina	CA	93933
		Asian Pacific Environmental Network	426 17th St #500	Oakland	CA	94612
Stephanie	Chen	Greenlining Institute	360 14th Street, 2nd Floor	Oakland	CA	94612

TABLE E-4 INTERESTED PARTIES INCLUDING ENVIRONMENTAL JUSTICE AND COMMUNITY-BASED ORGANIZATIONS						
First Name	**Last Name**	**Organization**	**Address**	**City**	**State**	**Zip**
		Local Initiatives Support Corporation (LISC) Bay Area	1970 Broadway Suite 1100	Oakland	CA	94612
		GRID Alternatives	1171 Ocean Avenue, Suite 200	Oakland	CA	94608
Strela	Cervas	California Environmental Justice Alliance	1904 Franklin Street, Ste. 250	Oakland	CA	94612
Mia	Kitahara	StopWaste	1537 Webster St.	Oakland	CA	94612
		Center for Biological Diversity (CBD)	1212 Broadway, St. #800	Oakland	CA	94612
		The People's Senate	1999 Harrison Street, Suite 650	Oakland	CA	94612
		Center on Race, Poverty and Environment (CRPE)	1999 Harrison Street, Suite 650	Oakland	CA	94612
		The East Oakland Collective	PO Box 5382	Oakland	CA	94605
Bob	Allen	Urban Habitat Program	2000 Franklin Street	Oakland	CA	94612
		Union of Concerned Scientists	500 12th Street, Suite 340	Oakland	CA	94607
		People United for a Better Oakland (PUEBLO)	1728 Franklin Street	Oakland	CA	94612
Susannah	Churchill	Vote Solar	360 22nd Street, Suite 730	Oakland	CA	94612
Bradley	Angel	GreenAction	315 Sutter Street, 2nd Fl	San Francisco	CA	94108
		Literacy for Environmental Justice	P.O. Box 170039	San Francisco	CA	94117-0039
		Bluegreen Alliance	369 Pine Street, Suite 700	San Francisco	CA	94104
Maria	Stamas	Natural Resources Defense Council (NRDC)	111 Sutter Street, 21st Floor	San Francisco	CA	94104
Eddie	Ahn	Brightline Defense	1028A Howard Street	San Francisco	CA	94103
Jennifer	Berg	Association of Bay Area Governments (ABAG)	375 Beale Street, suite 700	San Francisco	CA	94105-2066
Ivan	Jimenez	Brightline Defense	1028A Howard Street	San Francisco	CA	94103
Erica	McConnell	Shute, Mihaly & Weinberger LLP	396 Hayes St.	San Francisco	CA	94102

TABLE E-4 INTERESTED PARTIES INCLUDING ENVIRONMENTAL JUSTICE AND COMMUNITY-BASED ORGANIZATIONS						
First Name	**Last Name**	**Organization**	**Address**	**City**	**State**	**Zip**
Antonio	Diaz	People Organizing to Demand Environmental and Economic Rights (PODER)	474 Valencia Street, #125	San Francisco	CA	94103
		Environmental Law and Justice Clinic	536 Mission Street	San Francisco	CA	94105
		Bayview Hunters Point Community Advocates (Karen Pierce)	186 Maddux Avenue	San Francisco	CA	94124
		Silicon Valley Toxics Coalition	PO Box 27669	San Franciso	CA	94127
		Santa Clara Valley Audubon Society (SCVAS)--McClellan Ranch Preserve	22221 McClellan Road	Cupertino	CA	95014
		Loma Prieta Sierra Club Chapter Office	39821 East Bayshore Road, Suite 204	Palo Alto	CA	94303

APPENDIX B

June 22, 2022

MEMORANDUM AND UPDATE TO AIR QUALITY SECTION OF FINAL EIR

State of California **California Natural Resources Agency**

M e m o r a n d u m

To: Vice Chair Siva Gunda, Presiding Member
Commissioner Kourtney Vaccaro, Associate Member

Date: June 22, 2022
Telephone:(916) 661-8458

From: **Eric Veerkamp, Project Manager**
STEP, Siting and Environmental Office
California Energy Commission
715 P Street
Sacramento, California 95814-6400

Subject: **UPDATE TO AIR QUALITY SECTION OF FEIR; FOR THE CA3 BACKUP GENERATING FACILITY (CA3BGF) SMALL POWER PLANT EXEMPTION (21-SPPE-01)**

In compliance with the Committee's direction following the CA3 Evidentiary Hearing conducted on May 27, 2022, staff is providing an update to the Air Quality section of the final environmental impact report (FEIR); the attached revised section constitutes staff's update. Staff has developed this update in coordination with the applicant. The data refinements contained in this update provide additional clarity to staff's analysis in three main areas; to provide clearer definitions of the Bay Area Air Quality Management District's CEQA Guidelines' thresholds of significance, a more thorough explanation of the reduction in background emissions associated with the Caltrain electrification, and discussion of impacts from all stationary sources within 1,000 feet as opposed to 2,000 feet.

4.3 Air Quality

This section describes the environmental setting and regulatory background and discusses impacts specific to air quality associated with the demolition/construction, readiness testing and maintenance, and the potential for emergency operation of the CA3 Data Center (CA3DC) and the associated CA3 Backup Generating Facility (CA3BGF), known together as the project. It is important to note that intermittent and standby emitting sources, like those proposed in this project, could operate for emergency use, and such emergency operations would be infrequent and for unplanned circumstances, which are beyond the control of the project owner. Emergency operations and the impacts of air pollutants during emergencies are generally exempt from air district offsetting and modeling requirements. Emissions from emergency operations are not regular, expected, or easily quantifiable such that they cannot be modeled or predicted with certainty.

AIR QUALITY Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Environmental checklist established by CEQA Guidelines, Appendix G.

4.3.1 Summary

In this analysis, CEC staff (staff) concludes that, with the implementation of mitigation measure **AQ-1** and oxides of nitrogen (NOx) emissions fully offset through the permitting process with Bay Area Air Quality Management District (BAAQMD), the project would not have a significant impact on air quality. Staff analyzes two primary types of air emissions: (1) criteria pollutants, which have health-based ambient air quality standards (AAQS); and (2) toxic air contaminants (TACs), which are identified as potentially harmful even at low levels and have no established safe levels or health-based AAQS. The project would be constructed in two phases, with Phase I including demolition, grading, the installation of utility services, the construction of an on-site substation, the construction of the entire shell of the CA3DC building, and placement of approximately one-half of the gensets, and Phase II including the interior buildout and placement of the emergency backup generators for the second half of the CA3DC building (CEC 2022a). Staff analyzes the project's impacts on air quality during demolition/construction, routine operation, and the potential for emergency operation of the emergency backup generators (gensets). Staff also analyzes the potential cumulative effects of the project on air quality.

4.3.1.1 Significance Criteria

This air quality evaluation assesses the degree to which the project would potentially cause a significant impact according to the California Environmental Quality Act (CEQA) guidelines. BAAQMD is the local air district responsible for the attainment and maintenance of the federal and state AAQS and associated program requirements at the project location. The analysis is based upon the methodologies and related thresholds of significance in BAAQMD's May 2017 CEQA Air Quality Guidelines (BAAQMD 2017b) to determine the significance of the potential air quality emissions and impacts. These methodologies include qualitative determinations and the quantification of whether project construction or operation would exceed numeric emissions and health risk thresholds (BAAQMD 2017b).

BAAQMD CEQA Guidelines project-level thresholds of significance ("BAAQMD significance thresholds") for criteria pollutants and precursor pollutants and the health risks of TACs that apply during construction and operation are shown in **Table 4.3-1**. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the Bay Area region's existing air quality conditions. Staff evaluates project emissions against the BAAQMD significance thresholds under environmental checklist criterion "b."

For fugitive dust emissions during construction periods, the BAAQMD CEQA Guidelines do not have a significance threshold. Rather, BAAQMD recommends using a current Best Management Practices (BMPs) approach, which has been a pragmatic and effective approach to the control of fugitive dust emissions.

Staff also evaluates the project's potential to expose sensitive receptors to substantial pollutant concentrations under environmental checklist criterion "c." Staff addresses both the ambient air quality impacts of criteria pollutants, which have health-based standards, and the impacts of TACs, which are identified as potentially harmful even at low levels and have no established safe levels or health-based ambient air quality standards.

The analysis includes ambient air quality impact modeling for demolition/construction and operation, which consists of readiness testing and maintenance, of the proposed diesel-fueled gensets to estimate the air quality impacts caused by the emissions. The AAQS, shown in **Table 4.3-2**, are health protective values, so staff uses these health-based regulatory standards to help define what is considered a substantial pollutant concentration for criteria pollutants.[1] Staff's analysis determines whether the project would be likely to exceed any AAQS or contribute substantially to an existing or projected air quality violation, and, if necessary, proposes mitigation to reduce or eliminate these pollutant exceedances or substantial contributions.

TABLE 4.3-1 BAAQMD THRESHOLDS OF SIGNIFICANCE

<table>
<tr><th rowspan="2">Pollutant</th><th>Construction</th><th colspan="2">Operation</th></tr>
<tr><th>Average Daily Emissions (lbs/day)</th><th>Average Daily Emissions (lbs/day)</th><th>Maximum Annual Emissions (tpy)</th></tr>
<tr><td>ROG</td><td>54</td><td>54</td><td>10</td></tr>
<tr><td>NOx</td><td>54</td><td>54</td><td>10</td></tr>
<tr><td>PM10</td><td>82 (exhaust)</td><td>82</td><td>15</td></tr>
<tr><td>PM2.5</td><td>54 (exhaust)</td><td>54</td><td>10</td></tr>
<tr><td>PM10/ PM2.5 (fugitive dust)</td><td>Best Management Practices</td><td colspan="2">None</td></tr>
<tr><td>Local CO</td><td>None</td><td colspan="2">9.0 ppm (8-hour average), 20.0 ppm (1-hour average)</td></tr>
<tr><td>Risk and Hazards for New Sources and Receptors (Individual Project)</td><td>Same as Operation Threshold</td><td colspan="2">Compliance with Qualified Community Risk Reduction Plan
OR
Increased cancer risk of >10.0 in a million
Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute)
Ambient PM2.5 increase: > 0.3 µg/m³ annual average

<u>Zone of Influence</u>: 1,000-foot radius from property line of source or receptor</td></tr>
<tr><td>Risk and Hazards for New Sources and Receptors (Cumulative Threshold)</td><td>Same as Operation Threshold</td><td colspan="2">Compliance with Qualified Community Risk Reduction Plan
OR
Cancer: > 100 in a million (from all local sources)
Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic)
PM2.5: > 0.8 µg/m³ annual average (from all local sources)

<u>Zone of Influence</u>: 1,000-foot radius from property line of source or receptor</td></tr>
</table>

Source: BAAQMD 2017b, Table 2-1

Significance criteria also include Significant Impact Levels (SILs) for the particulate matter portions of the analysis. Regulatory agencies have traditionally applied SILs as a de minimis value, which represents the off-site concentration predicted to result from a source's emissions that does not warrant additional analysis or mitigation. If a source's modeled impacts at any off-site location do not exceed relevant SILs, the source owner

1 This approach provides a complete analysis that describes the foreseeable effects of the project in relation to all potential air quality related health impacts, including impacts of criteria pollutants to sensitive receptors; and therefore, addresses the California Supreme Court December 2018 *Sierra Club v. County of Fresno* opinion (https://www.courts.ca.gov/opinions/archive/S219783A.PDF).

would typically not need to assess multi-source or cumulative air quality to determine whether or not that source's emissions would cause or contribute to a violation of the relevant National Ambient Air Quality Standard (NAAQS) or California Ambient Air Quality Standard (CAAQS). In the project's vicinity, based on data from the local San Jose-Jackson Street air quality monitoring station about 4.6 miles east-southeast of the project site, shown in **Table 4.3-4**, the background levels of particulate matter of 10 micrometers or less in diameter (PM10) and particulate matter of 2.5 micrometers and smaller in diameter (PM2.5) already exceed the 24-hour and annual AAQS even before accounting for the project's emissions. Staff compares the project's contribution to local criteria pollutant concentrations to SILs to determine whether the project's emissions would contribute significantly to those exceedances.

BAAQMD does not have significance criteria in terms of PM10 concentrations or 24-hour concentrations of PM2.5. To determine if the project could contribute substantially to the existing PM10 exceedances, this analysis relies on the United States Environmental Protection Agency (U.S. EPA) PM10 SILs established in federal regulations for non-attainment areas (40 CFR 51.165(b)(2)) for 24-hour impacts (5 μg/m^3) and for annual impacts (1 μg/m^3). The same federal regulation (40 CFR 51.165(b)(2)) also established the U.S. EPA PM2.5 SILs concentrations for 24-hour impacts (1.2 μg/m^3) and for annual impacts (0.3 μg/m^3).

- The BAAQMD significance threshold for a project-level increase in annual PM2.5 concentrations is also 0.3 micrograms per cubic meter (μg/m^3), as shown in **Table 4.3-1**. However, in April 2018, the U.S. EPA issued *Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program* (U.S. EPA 2018a), which recommends PM2.5 SILs levels for 24-hour impacts to be 1.2 μg/m^3 (as in [40 CFR 51.165(b)(2)]) and for annual impacts to be 0.2 μg/m^3 (lower than 0.3 μg/m^3). Note that the U.S. EPA SILs values are all based on the forms of the applicable NAAQS. For example, the 24-hour PM2.5 SILs of 1.2 μg/m^3 is based on the 98th percentile 24-hour concentrations averaged over three years. The annual PM2.5 SILs of 0.2 μg/m^3 is based on a three-year average of annual average concentrations. For this analysis, staff uses the U.S. EPA SILs as well as the BAAQMD CEQA Guidelines significance threshold to determine project impact significance of PM2.5 concentrations.

The health risks from the project's TACs emissions are compared with the BAAQMD significance thresholds for a single source. If risks to the maximally exposed sensitive receptors are below significance thresholds, then impacts to other receptors would also be below significance thresholds. Cumulative health risk assessment (HRA) results are also compared with the BAAQMD significance thresholds for cumulative risk and hazards. For HRA purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Therefore, there are two kinds of thresholds for TACs: cancer risk and non-cancer risk. Cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to acceptable reference exposure levels (REL) for each of the TACs with acute and chronic health effects. The significance thresholds for TACs and PM2.5 are listed in **Table 4.3-1** and summarized in the following text (BAAQMD 2017b).

CEQA requires staff to consider: "whether the cumulative impact is significant and whether the effects of the project are cumulatively considerable," [CEQA Guidelines § 15064(h)(1)]. The following paragraphs show the two sets of thresholds used by staff in the assessment of: (1) whether the effects of the project are cumulatively considerable; and (2) the significance of the cumulative impact for public health.

The BAAQMD recommends that operational-related TAC and PM2.5 emissions generated by a single source would be a significant impact and a cumulatively considerable contribution to local community risk and hazard impacts if emissions would cause impacts or cancer risks that would exceed the following thresholds (BAAQMD 2017b, pp.5-3 and 5-4)~~significance thresholds for a single source are as follows~~:

- An excess lifetime cancer risk level of more than 10 in one million.
- A non-cancer chronic HI greater than 1.0.
- A non-cancer acute HI greater than 1.0.
- An incremental increase in the annual average PM2.5 concentration of greater than 0.3 µg/m^3.

The BAAQMD CEQA Guidelines significance thresholds for cumulative impacts are also summarized below. Following the BAAQMD CEQA Guidelines (BAAQMD 2017b, p.5-16),~~A project would have a~~the cumulativel~~y considerable~~ impact would be significant if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot distance from the fence line of a source and the contribution from the project, exceeds the following:

- An excess lifetime cancer risk level of more than 100 in one million.
- A non-cancer chronic HI greater than 10.0.
- An annual average PM2.5 concentration of greater than 0.8 µg/m^3.

Additionally, if a project would not exceed the BAAQMD significance thresholds discussed above, then a project would also be consistent with and not have any impact on BAAQMD's Bay Area 2017 Clean Air Plan. This plan provides a regional strategy to protect public health and the climate, and it defines an integrated, multipollutant control strategy to reduce emissions of particulate matter, TACs, ozone and key ozone precursors, and greenhouse gases (GHG). The environmental checklist criterion "a" in this air quality analysis addresses the consistency of the project with BAAQMD's Bay Area 2017 Clean Air Plan.

4.3.1.2 Criteria Pollutants (including Fugitive Dust)

i. Construction

Under environmental checklist criterion "b," staff explains that construction-phase emissions are a result of construction equipment, material movement, paving activities, and on-site and off-site vehicle trips, such as material haul trucks, worker commutes, and delivery vehicles. The project would be constructed in two phases, with Phase I including demolition, grading, the installation of utility services, the construction of an on-site substation, the construction of the entire shell of the CA3DC building, and placement of approximately one-half of the gensets and Phase II including the interior buildout and placement of the emergency backup generators for the second half of the CA3DC building. Project construction would occur for a total of about 22 months.

As shown in **Table 4.3-5**, the project's average daily criteria pollutant emissions during construction would be lower than the relevant numeric BAAQMD significance thresholds. There is no numerical threshold for fugitive dust generated during construction. The BAAQMD CEQA Guidelines recommend the control of fugitive dust through BMPs to conclude that impacts from fugitive dust emissions are less than significant (BAAQMD 2017b). Staff recommends **AQ-1**, which incorporates the project applicant's proposed measures that would include BAAQMD's recommended construction BMPs and exhaust emissions mitigation measures. With the implementation of **AQ-1**, the fugitive dust impacts from construction would be less than significant.

Under environmental checklist criterion "c," staff also analyzes the localized impacts of construction criteria pollutant emissions by comparing them with the AAQS. As shown in **Table 4.3-7**, staff finds that construction emissions would not contribute to any exceedance of the AAQS, except to the preexisting exceedances of PM10 and PM2.5. For PM10 and PM2.5, the project's contributions to the concentrations of PM10 and PM2.5 at sensitive receptor locations would be below the relevant SILs. Therefore, the project would not expose sensitive receptors to substantial criteria pollutant concentrations during construction. Construction is considered short-term, and construction impacts would be further reduced with the implementation of **AQ-1**, which includes BAAQMD's recommended construction BMPs and exhaust emissions mitigation measures.

With the implementation of **AQ-1**, criteria pollutant and fugitive dust emissions from project construction would not exceed any BAAQMD CEQA Guidelines significance threshold, cause a cumulatively considerable net increase of any criteria pollutant, conflict with or obstruct any applicable regional or local air quality plan, or expose sensitive receptors to substantial criteria pollutant concentrations, and would, thus, be less than significant.

ii. Operation and Maintenance

Staff evaluates criteria pollutant emissions from operation and maintenance in two sections: (A) "routine operation" emissions including, among other things, emissions from readiness testing and maintenance of the 44 gensets; and (B) "emergency operation" emissions from using the gensets to support the electricity demand of the project.

(A) Routine Operation

Under environmental checklist criterion "b," staff concludes that criteria pollutant emissions from the project's routine operation would be less than significant with NOx emissions fully offset through the permitting process with BAAQMD. Routine operation of the project would generate criteria pollutant emissions from readiness testing and maintenance of the 44 gensets, off-site vehicle trips for worker commutes and material deliveries, and facility upkeep, such as architectural coatings, consumer product use, landscaping, water use, waste generation, natural gas use for comfort heating, and electricity use.

As shown in **Table 4.3-6**, staff finds that the project's total annual and average daily emissions of criteria pollutants from routine operation would be below the BAAQMD CEQA Guidelines significance thresholds, except for NOx emissions. The project's gross total NOx emissions would exceed BAAQMD significance thresholds and could, therefore, contribute to a cumulatively considerable net increase of NOx emissions. However, during BAAQMD's permitting process, BAAQMD will require the applicant to fully offset its NOx emissions. With NOx emissions fully offset, the project's total net annual and average daily emissions would not exceed any of the BAAQMD significance thresholds.

The project would also emit ammonia from the urea used in the selective catalytic reduction (SCR) system. There is no BAAQMD threshold for ammonia, which is not a criteria pollutant but instead a precursor to particulate matter. Because the project's primary emissions of particulate matter are well below the BAAQMD CEQA Guidelines significance thresholds, secondary particulate matter impacts from the project's ammonia emissions of 0.29 tons per year (tpy) would be less than significant and not require additional mitigation or offsets.

Under environmental checklist criterion "c," staff also analyzes the localized impacts of the project's criteria pollutant emissions during readiness testing and maintenance of the gensets by comparing them with the AAQS. As shown in **Table 4.3-8**, staff finds that the project's routine operation emissions would not contribute to any exceedance of any AAQS, except to the preexisting exceedances of PM10 and PM2.5. However, staff finds that the project's contributions to concentrations of PM10 and PM2.5 would be below the relevant SILs, and, therefore, would not expose sensitive receptors to substantial criteria pollutant concentrations.

Staff concludes that, with NOx emissions fully offset through the BAAQMD permitting process, criteria pollutant emissions from routine operation of the project would not exceed any BAAQMD CEQA Guidelines significance threshold, cause a cumulatively considerable net increase of any criteria pollutant, conflict with or obstruct any applicable regional or local air quality plan, or expose sensitive receptors to substantial criteria pollutant concentrations, and would, thus, be less than significant.

(B) Emergency Operation

The emergency use of the gensets could occur in the event of a power outage or other disruption, upset, or instability that triggers a need for the project to use emergency backup power.

(1) Criteria Pollutant Emissions from Emergency Operation

As discussed under environmental checklist criterion "b," the BAAQMD 2019 policy, *Calculating Potential to Emit for Emergency Backup Power Generators*, requires a facility's potential to emit (PTE) to be calculated based on emissions proportional to emergency operation for 100 hours per year per genset, in addition to the permitted limits for readiness testing and maintenance (BAAQMD 2019). However, after comparing the PTE calculated to determine the account eligibility threshold, the applicant would only be required to offset permitted emissions from readiness testing and maintenance and not the emissions from emergency operation. BAAQMD requires the use of offsets to counterbalance increases in regular and predictable emissions, not increases in emissions occurring infrequently when emergency conditions arise.

In addition, emissions during routine operation are conservatively estimated with the assumption of 35 hours of readiness testing and maintenance per year per engine. As discussed in **Section 4.8 Greenhouse Gas Emissions**, the project applicant would probably need to limit the readiness testing and maintenance to 20 hours per year per engine to lower the GHG emissions to the pending, still-to-be-adopted BAAQMD CEQA GHG threshold of significance of 2,000 metric tons of carbon dioxide equivalent per year ($MTCO_2e$/yr) if applicable at the time of permitting. However, other data center project applicants previously have stated that routine testing and maintenance would rarely exceed 12 hours per year. Based on the evidence about the likelihood and duration of emergency operation, the allowance of 20 (or 35) hours per engine per year likely accommodates the average annual emergency operation emissions. Thus, staff concludes that the project would be unlikely to cause a cumulatively considerable net increase of any criteria pollutant.

(2) Criteria Pollutant Impacts from Emergency Operation

As discussed in detail under ***Emergency Operations Impacts for Criteria Pollutants*** under environmental checklist criterion "c," the air quality impacts of genset operation during emergencies are not quantified below because the impacts of emergency operations are typically not evaluated during facility permitting and local air districts do not normally conduct an air quality impact assessment of such impacts. Staff assessed the likelihood of emergency events but finds that assessing the air quality impacts of emergency operations would require a host of unvalidated, unverifiable, and speculative assumptions about when and under what circumstances such a hypothetical emergency would occur. Such a speculative analysis is not required under CEQA (CEQA Guidelines §§ 15064(d)(3) and 15145), and, most importantly, would not provide meaningful information by which to determine project impacts. If emergency operation becomes a more frequent occurrence and more data is gathered regarding when and how these facilities operate during emergency situations, this conclusion might change.

Staff reviewed the BAAQMD comments on the Notice of Preparation (NOP) regarding the use of diesel engines for "non-testing/non-maintenance" purposes (BAAQMD 2021b) and confirmed that these types of events are infrequent, irregular, and unlikely and the resulting emissions are not easily predictable or quantifiable. See more detailed discussion under ***Emergency Operations Impacts for Criteria Pollutants*** under environmental checklist criterion "c."

iii. Cumulative Impacts

Staff concludes that the project's criteria pollutant emissions would not be cumulatively significant. BAAQMD CEQA Guidelines state that if a project's daily average or annual emissions of operational-related criteria pollutants or precursors do not exceed any BAAQMD threshold of significance, as listed in **Table 4.3-1** above, the project would not result in a cumulatively significant impact. As explained above, staff finds that all the criteria pollutant emissions would be below the BAAQMD CEQA Guidelines thresholds of significance with the implementation of **AQ-1** and NOx emissions would be fully offset through the BAAQMD permitting process.

In addition, under environmental checklist criterion "c," staff performed a cumulative impacts analysis for annual PM2.5 impacts as part of a cumulative HRA. Staff concludes that the project's contribution to the annual PM2.5 concentrations would not be cumulatively significant.

Thus, staff concludes that the project's criteria pollutant emissions from the routine operation of the project would not be cumulatively significant.

4.3.1.3 Toxic Air Contaminants (TACs)

Under environmental checklist criterion "c," staff analyzes the potential impacts of the project's TAC emissions separately for construction and routine operation. Staff also analyzes the cumulative effects of the project's TAC emissions together with the impacts of other sources within 1,000 feet. Staff concludes that the individual and cumulative impacts from the project's TAC emissions would be less than significant.

Staff finds the health risks at ~~most~~ all sensitive receptor locations would be less than the BAAQMD CEQA Guidelines significance thresholds shown in **Table 4.3-1**. Staff concludes that the health risks from project construction and routine operation would not cause a cumulatively considerable contribution to local community risk and hazard impacts, ~~be less than significant~~ and the construction impact would be further reduced with the implementation of **AQ-1**.

Staff finds that significant cumulative health risks would not occur at sensitive receptor locations, and the project's contribution is not cumulatively considerable because the project effects would be less than the BAAQMD CEQA Guidelines significance thresholds shown in **Table 4.3-1**. Staff concludes that the effect of cumulative TAC emissions would be less than significant.

4.3.1.4 Background on Air Quality Evaluation

Criteria Pollutant Evaluation

California Air Resources Board (CARB) and U.S. EPA have each established federal and state AAQS for criteria pollutants. While both NAAQS and CAAQS apply to every location in California, typically the state standards are lower (i.e., more stringent) than federal standards. Air monitoring stations, usually operated by local air districts or CARB, measure the ambient air to determine an area's attainment status for NAAQS and CAAQS. Depending on the pollutant, the time over which these pollutants are measured varies from 1-hour, to 3-hours, to 8-hours, to 24-hours and to annual averages. Most criteria pollutants have ambient standards with more than one averaging time. Pollutant concentrations are expressed in terms of mass of pollution per unit volume of air, typically using micrograms for the mass portion of the expression and cubic meters of air for the volume, or "micrograms per cubic meter of air, expressed as "$\mu g/m^3$." The concentration can also be expressed as parts of pollution per million parts of air or "ppm." AAQS appear in Section 4.3.2 of this analysis.

Some forms of air pollution are primary air pollutants, which are gases and particles directly emitted from stationary and mobile sources. Other forms of air pollution are secondary air pollutants that result from complex interactions between primary pollutants, background atmospheric constituents, and other secondary pollutants. Some pollutants can be a combination of both primary and secondary formation, such as PM2.5. In this case, the primary pollutant component of PM2.5 is directly emitted from the stack of diesel-fueled engines and the secondary pollutant component of PM2.5 is formed in the air by the transformation of gaseous NOx and sulfur oxides (SOx) into particles. In this case, the NOx and SOx emissions are precursors to the formation of the secondary aerosol pollutant.

Emissions of NOx include nitric oxide (NO) and nitrogen dioxide (NO_2). In the case of stack emissions from diesel-fueled engines, approximately 90 percent of the NOx is in the form of NO while the remainder is directly emitted NO_2. The ambient standards are expressly for NO_2, not NO. Once these gases exit the stack, chemical reactions in the region downwind of the facility, meteorological conditions, and sunlight interact to convert the NO into NO_2, ozone, and particulates. Most ozone in the ambient air is not directly emitted. Rather, it is formed in the air when the NO to NO_2 reaction occurs, followed by a set of complex reactions including interactions with volatile organic compounds (VOC). BAAQMD uses the term precursor organic compounds (POC) instead of VOC.

California is divided into 35 local air districts. Some of these local governmental agencies are called "air quality management districts," while others are called "air pollution control districts." Generally, state law designates local air districts as having primary responsibility for the control of air pollution from all sources other than mobile sources while the control of vehicular air sources is the responsibility of CARB. (Health and Safety Code, §39002) Additionally, CARB is charged with coordinating efforts to attain and maintain CAAQS and NAAQS. (Health and Safety Code, §39003) Areas that meet the AAQS, based upon air monitoring measurements made by either the local air district or CARB, are classified as "attainment areas," and areas that have monitoring data that exceed AAQS are classified as "nonattainment areas." (Health and Safety Code, §39608) Additionally, any given area can be classified as attainment for some pollutants and nonattainment for others. Even for the same pollutant, an area can be attainment for one averaging time and nonattainment for another.

Air districts adopt rules and attainment and maintenance plans aimed at protecting public health and reducing emissions. (Health and Safety Code, §40001) Air districts incorporate these requirements into the State Implementation Plan (SIP), which CARB submits for approval to the U.S. EPA as the state's overall plan to come into attainment for federal NAAQS. (Health and Safety Code, §39602) Once a SIP is approved by the U.S. EPA and published in the Federal Register, the requirements in the SIP become federally enforceable. Consistency of the project with the applicable air quality management plan is addressed as part of environmental checklist criterion "a" in this air quality analysis.

For those facilities subject to CEC jurisdiction, the project is evaluated to determine whether it would be able to comply with all applicable local, state, and federal requirements. If the CEC is issuing the license, this analysis occurs during the review of the Application for Certification (AFC), with the local air district participating in this process by preparing a Determination of Compliance (DOC). However, since this project is going through an exemption to the AFC process under the Small Power Plant Exemption, the DOC is not prepared. If the proposed generating capacity is 50 megawatts (MW) to

100 MW, the CEC conducts a CEQA review before allowing the project to be exempt from CEC's AFC licensing. Once the CEC's jurisdictional process is approved, the local air district would then implement its permit review process and, if the proposed facility meets local air district requirements, an operating permit would be issued by that air district.

The local air district's New Source Review (NSR) program does the following: (1) defines the facility's potential-to-emit; (2) determines whether the sources would achieve minimum performance standards; (3) assesses whether the sources would achieve the Best Available Control Technology (BACT) requirements; and (4) determines whether the project would trigger offset requirements. These issues are addressed as part of environmental checklist criterion "b" in this air quality analysis.

Non-Criteria Pollutant Evaluation

Non-criteria pollutants that are typically evaluated are airborne toxic pollutants identified to have potential harmful human health impacts. Evaluations assess the potential risks from TACs and hazardous air pollutants (HAPs). TACs include toxic air pollutants identified by CARB, and HAPs include toxic air pollutants identified at the federal level. Most toxic air pollutants do not have AAQS; however, AAQS have been established for a few pollutants. Since TACs have no AAQS that specify health-based levels considered safe for everyone, a HRA is used to determine if people might be exposed to those types of pollutants at unhealthy levels.

TACs are separated into "carcinogens" and "non-carcinogens" based on the nature of the physiological effects associated with exposure. There are two types of thresholds for TACs: cancer risk and non-cancer risk. Cancer risk is expressed as excess cancer cases per 1 million exposed individuals, typically over a lifetime of exposure. Acute and chronic exposure to non-carcinogens is expressed as a HI, which is the ratio of expected exposure levels to acceptable REL for each of the TACs associated with acute and chronic health effects.

The impact evaluation of toxic pollutants focuses on the project's incremental impact due to diesel particulate matter (DPM) exhaust from construction equipment and from the stacks of the diesel-fueled gensets. That is because DPM is the primary TAC of concern. This issue is addressed as part of environmental checklist criterion "c" in this air quality analysis.

Odor Impact Evaluation

Aside from criteria pollutants and TACs, impacts may arise from other emissions, notably related to odor. This issue is addressed as part of environmental checklist criterion "d" in this air quality analysis.

4.3.2 Environmental Setting

The proposed project is proposed to be located at 2590 Walsh Avenue in Santa Clara. The property is irregularly shaped and is bounded on the northwest by an existing microelectronics testing facility, on the northeast by a software research and development facility, on the south by an operational CalTtrain rail line, on the east by Walsh Avenue, and on the west by an existing Silicon Valley Power (SVP) substation (Uranium Substation). The Vantage Santa Clara Data Center Campus CA1 is east across Walsh Avenue.

Refer to the **Section 3 Project Description** for further details regarding the project.

Criteria Pollutants

The U.S. EPA and the CARB have established AAQS for several pollutants based on their adverse health effects. The U.S. EPA has set NAAQS for ozone (O_3), carbon monoxide (CO), NO_2, PM10, PM2.5, sulfur dioxide (SO_2), and lead (Pb). These pollutants are commonly referred to as "criteria pollutants." Primary standards were set to protect public health; secondary standards were set to protect public welfare against visibility impairment, damage to animals, crops, vegetation, and buildings. In addition, CARB has established CAAQS for these pollutants, as well as for sulfate (SO_4), visibility reducing particles, hydrogen sulfide (H_2S), and vinyl chloride. CAAQS are generally stricter than NAAQS. The standards currently in effect in California and relevant to the project are shown in **Table 4.3-2**.

TABLE 4.3-2 NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards [a]	National Standards [b]	
			Primary	Secondary
O_3	1-hour	0.09 ppm (180 μg/m^3)	—	Same as Primary Standard
	8-hour	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)	
PM10	24-hour	50 μg/m^3	150 μg/m^3	Same as Primary Standard
	Annual Mean	20 μg/m^3	—	
PM2.5	24-hour	—	35 μg/m^3	Same as Primary Standard
	Annual Mean	12 μg/m^3	12 μg/m^3	15 μg/m^3
CO	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
NO_2	1-hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3) [c]	—
	Annual Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	Same as Primary Standard
SO_2 [d]	1-hour	0.25 ppm (655 μg/m^3)	75 ppb (196 μg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 μg/m^3)
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas) [d]	—
	Annual Mean	—	0.030 ppm (for certain areas) [d]	—

Notes: ppm=parts per million; ppb = parts per billion; μg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; "—" = no standard

[a] California standard for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded.

[b] National standards (other than O_3, PM, NO_2 [see note c below], and those based on annual arithmetic mean) are not to be exceeded more than once a year. The 8-hour O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. The 24-hour PM10 standard of 150 μg/m^3 is not to be exceeded more than once per year on average over a 3-year period. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentile concentration is less than or equal to 35 μg/m^3.

[c] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 0.100 ppm.

[d] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The previous SO_2 standards (24-hour and annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is a U.S. EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Sources: BAAQMD 2021a, U.S. EPA 2021a

Attainment Status and Air Quality Plans

The U.S. EPA, CARB, and the local air districts classify an area as attainment, unclassified, or nonattainment, depending on whether the monitored ambient air quality data show compliance, insufficient data are available, or non-compliance with the AAQS, respectively. The proposed project would be in Santa Clara County in the San Francisco Bay Area Air Basin (SFBAAB), under the jurisdiction of BAAQMD. **Table 4.3-3** summarizes attainment status for the relevant criteria pollutants in the SFBAAB with both NAAQS and CAAQS.

TABLE 4.3-3 ATTAINMENT STATUS FOR SFBAAB

Pollutant	Averaging Time	State Designation	Federal Designation
O_3	1-hour	Nonattainment	—
	8-hour	Nonattainment	Nonattainment
PM10	24-hour	Nonattainment	Unclassified
	Annual	Nonattainment	—
PM2.5	24-hour	—	Nonattainment [a]
	Annual	Nonattainment	Unclassifiable/attainment [b]
CO	1-hour	Attainment	Attainment
	8-hour	Attainment	Attainment
NO_2	1-hour	Attainment	Unclassifiable/Attainment
	Annual	Attainment	Attainment
SO_2	1-hour	Attainment	Attainment/Unclassifiable [c]
	24-hour	Attainment	— [d]
	Annual	—	— [d]

Notes:

[a] On January 9, 2013, U.S. EPA issued a final rule to determine that the Bay Area attains the 24-hour PM2.5 national standard (U.S. EPA 2013). This U.S. EPA rule suspends key SIP requirements as long as monitoring data continues to show that the Bay Area attains the standard. Despite this U.S. EPA action, the Bay Area will continue to be designated as "non-attainment" for the national 24-hour PM2.5 standard until such time as the BAAQMD submits a "redesignation request" and a "maintenance plan" to U.S. EPA, and U.S. EPA approves the proposed redesignation.

[b] In December 2012, U.S. EPA strengthened the annual PM2.5 NAAQS from 15.0 to 12.0 $\mu g/m^3$. In December 2014, U.S. EPA issued final area designations for the 2012 primary annual PM2.5 NAAQS (U.S. EPA 2014). Areas designated "unclassifiable/attainment" must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.

[c] On January 9, 2018, U.S. EPA issued a final rule to establish the initial air quality designations for certain areas in the U.S. for the 2010 SO_2 primary NAAQS (U.S. EPA 2018b). This final rule designated the SFBAAB as attainment/unclassifiable for the 2010 SO_2 primary NAAQS.

[d] See noted under **Table 4.3-2**.

Sources: CARB 2021a, BAAQMD 2021a, U.S. EPA 2013, U.S. EPA 2014, U.S. EPA 2018b

Overall air quality in the SFBAAB is better than most other developed areas in California, including the South Coast, San Joaquin Valley, and Sacramento air basin regions. This is due to a more favorable climate with cooler temperatures and regional air flow patterns that transport pollutants emitted in the air basin out of the air basin. Although air quality improvements have occurred, violations and exceedances of the state ozone and PM standards continue to persist in the SFBAAB, and still pose challenges to CARB and local air districts (CARB 2013). The project area's proximity to both the Pacific Ocean and the San Francisco Bay has a moderating influence on the climate. This portion of the Santa Clara Valley is bounded by the San Francisco Bay to the north, the Santa Cruz Mountains to the southwest and west, and the Diablo Range to the northeast. The surrounding terrain greatly influences winds in the valley, resulting in a prevailing wind that flows along the Santa Clara Valley's northwest-southeast axis.

Pollutants in the air can cause health problems, especially for children, the elderly, and people with heart or lung problems. Healthy adults may experience symptoms during periods of intense exercise. Pollutants can also cause damage to vegetation, animals, and property.

Existing Ambient Air Quality

The nearest background ambient air quality monitoring station to the project is the San Jose-Jackson Street station, which is about 4.6 miles east-southeast of the project site. **Table 4.3-4** presents the air quality monitoring data from the San Jose-Jackson Street monitoring station from 2016 to 2020, the most recent years for which data are available. Data in this table that are marked in **bold** indicate that the most-stringent current standard was exceeded during that period.

TABLE 4.3-4 AMBIENT AIR QUALITY MONITORING DATA

Pollutant	Averaging Time	2016	2017	2018	2019	2020
O_3 (ppm)	1-hour	0.087	**0.121**	0.078	**0.095**	**0.106**
	8-hour	0.066	**0.098**	0.061	**0.081**	**0.085**
PM10 (µg/m^3)	24-hour	41	**70**	**121.8**	**77.1**	**137.1**
	Annual	18.5	**21.3**	**23.1**	19.1	**24.8**
PM2.5 (µg/m^3)	24-hour (98th percentile)	19	34.3	**73.4**	20.6	**56.1**
	Annual	8.4	9.5	**12.9**	9.1	11.5
NO_2 (ppb)	1-hour (maximum)	51.1	67.5	86.1	59.8	51.9
	1-hour (98th percentile)	42	50	59	52	45
	Annual	11.26	12.24	12.04	10.63	9
CO (ppm)	1-hour	2	2.1	2.5	1.7	1.9
	8-hour	1.4	1.8	2.1	1.3	1.5
SO_2 (ppb)	1-hour (maximum)	1.8	3.6	6.9	14.5	2.9
	1-hour (99th percentile)	2	3	3	2	2
	24-hour	0.8	1.1	1.1	1.5	0.8

Notes: All data from San Jose-Jackson Street monitoring station.
Concentrations in **bold** type are those that exceed the limiting ambient air quality standard.
Sources: CARB 2021b, U.S. EPA 2021b

The maximum concentration values listed in **Table 4.3-4** have not been screened to remove values that are designated as exceptional events. Violations that are the result of exceptional events, such as wildfires, are normally excluded from consideration as AAQS violations. Exceptional events undoubtedly affected many of the maximum concentration values in recent years, especially between September to mid-November during wildfire activity. The ozone, PM10, and PM2.5 in 2017, 2018, and 2020 illustrate the effect of events like the extensive northern California wildland fires.[2] Even though fires tended to be far from the monitoring stations, the blanket of smoke and adverse air quality most likely affected air monitoring stations in the urban areas surrounding the project. For a conservative analysis, staff uses the background ambient air quality concentrations from 2018 to 2020 to represent the baseline condition at the project site.

Health Effects of Criteria Pollutants

Below are descriptions of the health effects of criteria pollutants that are a concern in the regional study area. Health and Safety Code, section 39606 requires CARB to adopt ambient air quality standards at levels that adequately protect the health of the public, including infants and children, with an adequate margin of safety. Ambient air quality standards define clean air (CARB 2021c).

Ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and NOx, including NO_2. ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight.

Ozone can cause the muscles in the airways to constrict, trapping air in the alveoli, potentially leading to wheezing and shortness of breath. Ozone can make it more difficult to breathe deeply and vigorously; cause shortness of breath and pain when taking a deep breath; cause coughing and sore or scratchy throat; inflame and damage the airways; aggravate lung diseases, such as asthma, emphysema, and chronic bronchitis; increase the frequency of asthma attacks; make the lungs more susceptible to infection; continue to damage the lungs even when the symptoms have disappeared; and cause chronic obstructive pulmonary disease. Long-term exposure to ozone is linked to the aggravation of asthma and is likely to be one of many causes of asthma development. Long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children. The inhalation of ozone causes inflammation and irritation of the tissues lining human airways, causing, and worsening a variety of symptoms, and exposure to ozone can reduce the volume of air that the lungs breathe in and cause shortness of breath.

2 Wildfires also emit substantial amounts of volatile and semi-volatile organic materials and nitrogen oxides that form ozone and organic particulate matter (NOAA 2019).

People most at risk for adverse health effects from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure. Studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engage in vigorous activities compared to adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures.

Particulate Matter. PM10 and PM2.5 represent size fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health. The health effects of particulate matter may include cardiovascular effects, such as cardiac arrhythmias and heart attacks, and respiratory effects, such as asthma attacks and bronchitis. Particulates can also reduce visibility.

Nitrogen Dioxide. Breathing air with a high concentration of NO_2 can irritate airways in the human respiratory system. Such exposures over short periods (as represented by the 1-hour standards) can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 (as represented by the annual standards) may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly, are generally at greater risk for the health effects of NO_2. NOx (includes NO_2 and NO) reacts with other chemicals in the air and sunlight to form both particulate matter and ozone.

Carbon Monoxide. CO is a pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in the reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Sulfur Dioxide. SO_2 is produced through the combustion of sulfur or sulfur-containing fuels, such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (PM10 and PM2.5) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Lead. Lead has a range of adverse neurotoxin health effects and previously was predominately released into the atmosphere primarily via the combustion of leaded gasoline. The phase-out of leaded gasoline has resulted in decreasing levels of atmospheric lead.

Toxic Air Contaminants

Health and Safety Code, section 39655 defines a toxic air contaminant as "an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health." In addition, substances that have been listed as HAPs pursuant to 42 U.S.C. section 7412 are TACs under the state law pursuant to Health and Safety Code, section 39657 (b). CARB formally identified HAPs in California Code of Regulations, Title 17, section 93001 (OEHHA 2021). TACs, also referred to as HAPs or air toxics, are different from criteria pollutants, such as ground-level ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Criteria pollutants are regulated using NAAQS and CAAQS, as noted above. However, there are no ambient standards for most TACs[3] so site-specific HRAs are conducted to evaluate whether risks of exposure to TACs create an adverse impact. Specific TACs have known acute, chronic, and cancer health impacts. CARB has identified TACs in California Code of Regulations, Title 17, sections 93000 and 93001. The nearly 200 regulated TACs include asbestos, organic chemical compounds, and inorganic chemical compounds and compound categories, diesel exhaust, and certain metals. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act of 1987 (Health and Safety Code, sec. 44300 et. seq) apply to facilities that emit these listed TACs above regulated threshold quantities.

Health Effects of TACs

The health effects associated with TACs are quite diverse and generally are assessed locally rather than regionally. TACs could cause long-term health effects, such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term effects, such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches (BAAQMD 2017b, pg. 5-1). Numerous other health effects also have been linked to exposure to TACs, including heart disease, Sudden Infant Death Syndrome, respiratory infections in children, lung cancer, and breast cancer (OEHHA 2015).

The primary on-site TAC emission sources for the CA3BGF would be diesel engines, including engines in vehicles and equipment used during construction and stationery genset engines during readiness testing and maintenance. Diesel exhaust is a complex mixture of thousands of gases and fine particles and contains over 40 substances listed by the U.S. EPA as HAPs and by CARB as TACs. The solid material in diesel exhaust is known as DPM (CARB 2021d).

3 Ambient air quality standards for TACs exist for lead (federal and state standards), hydrogen sulfide (state standard), and vinyl chloride (state standard).

DPM has been the accepted surrogate for whole diesel exhaust since the late 1990s. CARB identified DPM as the surrogate compound for whole diesel exhaust in its Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant staff report in April 1998 (Appendix III, Part A, Exposure Assessment [CARB 1998]). DPM is primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust deserves particular attention mainly because of its ability to induce serious noncancerous effects and its status as a likely human carcinogen. Diesel exhaust is also characterized by CARB as "particulate matter from diesel-fueled engines." The impacts from human exposure would include both short and long-term health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Effects from long-term exposure can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer. Diesel exhaust is listed by the U.S. EPA as "likely to be carcinogenic to humans" (U.S. EPA 2002).

Sensitive Receptors

Sensitive receptors are defined as groups of individuals that may be more susceptible to health risks due to chemical exposure. Sensitive individuals, such as infants, the aged, and people with specific illnesses or diseases, are the subpopulations that are more sensitive to the effects of toxic substance exposure. Examples of sensitive receptors include residences, schools and school yards, parks and playgrounds, daycare centers, nursing homes, and medical facilities. Residences could include houses, apartments, and senior living complexes. Medical facilities could include hospitals, convalescent homes, and health clinics. Playgrounds could be play areas associated with parks or community centers (BAAQMD 2017b, pg. 5-8). The potential sensitive receptor locations evaluated in the HRA for CA3DC include (DayZenLLC 2021b, pg. 2):

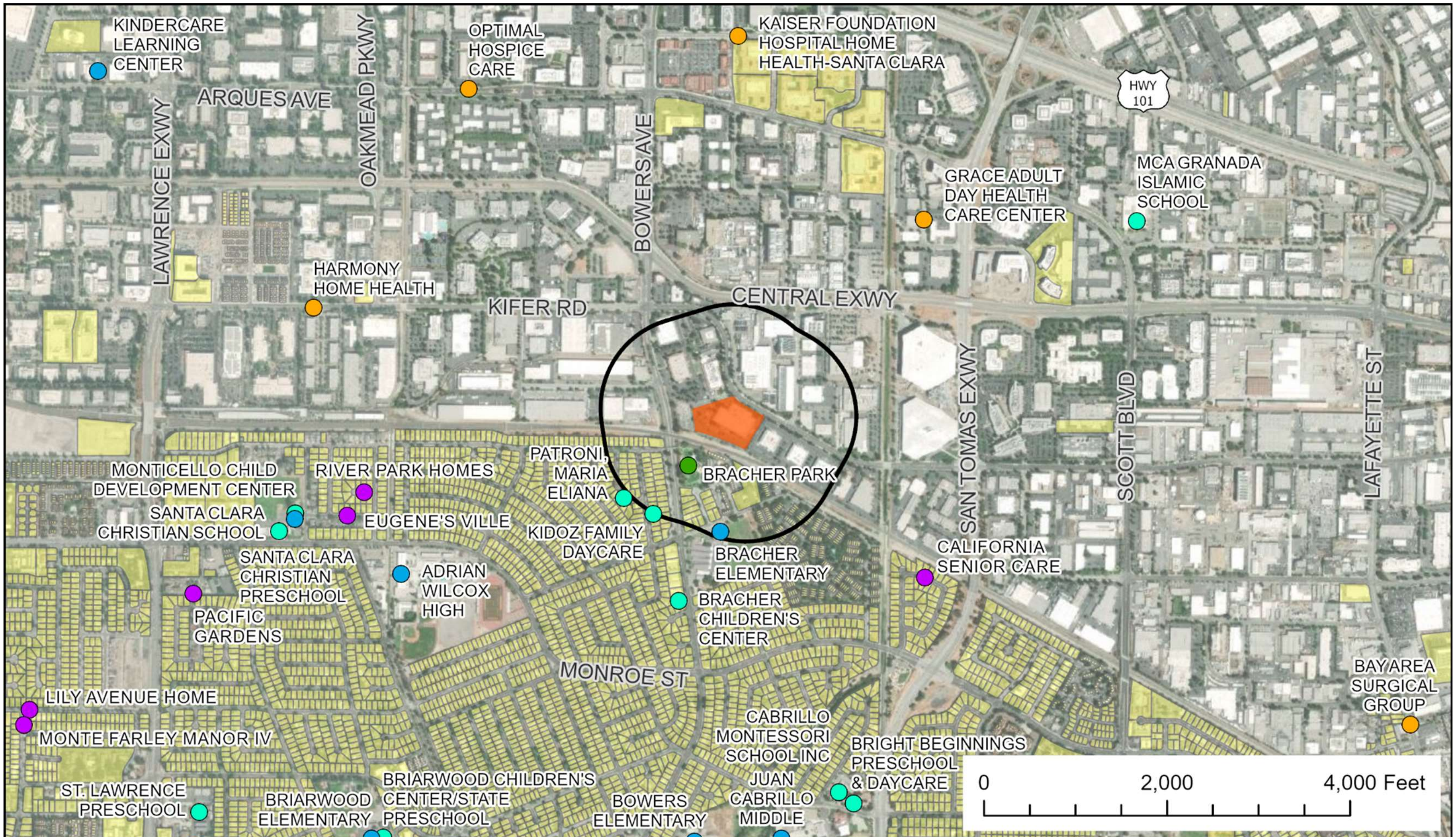
- Residential dwellings, including apartments, houses, and condominiums.
- Schools, colleges, and universities.
- Daycare centers.
- Hospitals and health clinics.
- Senior-care facilities.

Sensitive Receptors Near the Project

BAAQMD CEQA Guidelines recommends that any proposed project, including the siting of a new TAC emissions source, assess associated community risks and hazards impacts within 1,000 feet of the proposed project and take into account both individual and nearby cumulative sources (that is, proposed project plus existing and foreseeable future projects). Cumulative sources represent the combined total risk values of each individual source within the 1,000-foot evaluation zone. A lead agency should enlarge the 1,000-foot radius on a case-by-case basis if an unusually large source or sources of risk or hazard emissions that may affect a proposed project is beyond the recommended radius (BAAQMD 2017b, Table 2-1, pg. 5-2, and pg. 5-3).

Staff previously used a six-mile radius for cumulative impacts analyses of power plant projects. Based on staff's modeling experience, beyond six miles there is no statistically significant concentration overlap for nonreactive pollutant concentration between two stationary emission sources. The six-mile radius is more appropriate to be used for the turbines with tall stacks and more buoyant plumes. But the diesel genset engines would result in more localized impacts due to shorter stacks and less buoyant plumes. The worst-case impacts of the diesel genset engines would occur at or near the fence line and decrease rapidly with distance from fence line. Therefore, staff believes that the BAAQMD CEQA Guidelines-recommended 1,000 feet is reasonable for the cumulative HRA of the project.

The project site is approximately 6.69 acres (DayZenLLC 2021a, pg. 2-1). The applicant conducted a sensitive receptor search within the 1,000-meter (3,280-ft) of the project, which is farther than the BAAQMD recommended 1,000-ft evaluation zone and determined that the closest residential uses are to the south across the existing Caltrain railroad right-of-way. The applicant also included a park directly south of the project site across the rail line as a potential sensitive receptor. The nearest sensitive receptor would be the nearest residential areas to the south across the existing Caltrain railroad right-of-way, which is about 175 feet from the fence line. The nearest school or daycare to the facility was found to be a school (i.e., Bracher Elementary) approximately 650 feet south of the project boundary. All schools and daycare facilities with 1,000 meters were also analyzed in the HRA (DayZenLLC 2021b, pg. 2). A list of the nonresidential sensitive receptors, such as school, recreation, and daycare, within or just beyond a 1,000-foot radius of the CA3DC project site was presented in Response to Data Request 22 (DayZenLLC 2021t, pg. 18). **Figure 4.3-1** shows the map of sensitive receptors near the project.



CA3 (Vantage) Backup Generating Facility
- Project Footprint
- 1,000 Ft. Influence Zone

Sensitive Receptors
- Day Care Facility
- Health Care Facility
- Nursing Home
- School
- Recreation
- Residential Community

Figure 4.3-1
1,000 Foot Influence Zone

Sources: California Energy Commission, HIFLD, USGS, CDPH, ORNL, Esri

Regulatory Background

Federal, state, and regional agencies share responsibility for managing and regulating air quality in the SFBAA.

Federal

Federal Clean Air Act. The federal Clean Air Act (CAA) (42 U.S.C. section 7401 et. seq) establishes the statutory framework for regulation of air quality in the United States. Under the CAA, the U.S. EPA oversees the implementation of federal programs for permitting new and modified stationary sources, controlling TACs, and reducing emissions from motor vehicles and other mobile sources.

Title I (Air Pollution Prevention and Control) of CAA requires the establishment of NAAQS, air quality designations, and plan requirements for nonattainment areas. States are required to submit a SIP to the U.S. EPA for areas in nonattainment with NAAQS. The SIP must demonstrate how state and local regulatory agencies will institute rules, regulations, and other programs to attain NAAQS. Once approved by the U.S. EPA and published in the Federal Register, the local air district rules contained in the SIP are federally enforceable.

The Prevention of Significant Deterioration (PSD) program is a federal program for federal attainment areas. The purpose of the federal PSD program is to ensure that attainment areas remain in attainment of NAAQS based upon a proposed facility's annual PTE. If the annual emissions of a proposed project are less than prescribed amounts, a PSD review is not required. CA3DC is not expected to be subject to PSD, with a final determination made by BAAQMD at the time of permitting subsequent to the CEC determination.

New Source Performance Standard (NSPS) Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. CAA section 111 (42 U.S.C. section 7411) authorizes the U.S. EPA to develop technology-based standards for specific categories of sources. Manufacturers of emergency stationary internal combustion engines (ICE) using diesel fuel must certify that new engines comply with these emission standards (40 CFR 60.4205). Under NSPS Subpart IIII, owners and operators of emergency engines must limit operation to a maximum of 100 hours per year for maintenance and testing, which allows for some use if necessary, to protect grid reliability; there is no time limit on the use of an emergency stationary ICE in emergency situations (40 CFR 60.4211(f)). The project's Tier 4 diesel-fired gensets would be subject to and likely to comply with the requirements in NSPS Subpart IIII.

National Emission Standards for Hazardous Air Pollutants. CAA section 112 42 U.S.C. section 7412) addresses emissions of HAPs. CAA defines HAPs as a variety of substances that pose serious health risks. Direct exposure to HAPs has been shown to cause cancer, reproductive effects or birth defects, damage to the brain and nervous system, and respiratory disorders. Categories of sources that cause HAP emissions are controlled through separate standards under CAA Section 112: National Emission

Standards for Hazardous Air Pollutants (NESHAP). These standards are specifically designed to reduce the potency, persistence, or potential bioaccumulation of HAPs. New sources that emit more than 10 tpy of any specified HAP or more than 25 tpy of any combination of HAPs are required to apply Maximum Achievable Control Technology (MACT).

Asbestos is a HAP regulated under the NESHAP. The asbestos NESHAP is intended to provide protection from the release of asbestos fibers during activities involving the handling of asbestos. CAA air toxics regulations specify work practices for asbestos to be followed during demolitions and renovations. The regulations require a thorough inspection of the area where the demolition or renovation would occur and advance notification of the appropriate delegated entity. Work practice standards that control asbestos emissions must be implemented, such as removing all asbestos-containing materials (ACM), adequately wetting all regulated ACM, and sealing ACM in leak-tight containers and disposing of the asbestos-containing waste material as expediently as practicable.

State

Generally, state law designates local air districts as having primary responsibility for the control of air pollution from all sources other than mobile sources while the control of vehicular air sources is the responsibility of CARB. (Health and Safety Code, §39002) CARB is also responsible for the state's overall air quality management, including, among other things, establishing CAAQS for criteria pollutants identifying TACs of statewide concern and adopting measures to reduce the emissions of those TACs through airborne toxic control measures (ATCM), and regulating emissions of GHGs.

Air Toxic "Hot Spots" Information and Assessment Act of 1987. The Air Toxic "Hot Spots" Information and Assessment Act of 1987 (Health and Safety Code, sec. 44300 et. seq), also known as Assembly Bill (AB) 2588, identifies TAC hot spots where emissions from specific stationary sources may expose individuals to an elevated risk of adverse health effects, particularly cancer or reproductive harm. Many TACs are also classified as HAPs. AB 2588 requires that a business or other establishment identified as a significant stationary source of toxic emissions provide the affected population with information about the health risks posed by their emissions.

Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines, Emergency Standby Diesel-Fueled Compression Ignition Engines. Statewide regulations govern the use of and emissions performance standards for emergency standby diesel-fueled engines, including those of the project. As defined in regulation (17 CCR §93115.4(a)(29)), an emergency standby engine is, among other possible use, one that provides electrical power during an emergency use and is not the source of primary power at the facility and is not operated to supply power to the electric grid. The corresponding ATCM (17 CCR §93115.6) restricts each emergency standby engine to operate no more than 50 hours per year for maintenance and testing purposes.

The ATCM establishes no limit on engine operation for emergency use or for emission testing to show compliance with the ATCM's standards.

Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. CARB has adopted the Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations to minimize the generation of asbestos from earth disturbance or construction activities (17 CCR §93105). The Asbestos ATCM applies to any project that would include sites to be disturbed in a geographic ultramafic rock unit area or an area where naturally occurring asbestos (NOA), serpentine, or ultramafic rocks are determined to be present. Based upon review of the U.S. Geological Survey map detailing the natural occurrence of asbestos in California, NOA is not expected to be present at the project site (Van Gosen and Clinkenbeard 2011).

Regional

BAAQMD is the regional agency charged with preparing, adopting, and implementing emissions control measures and standards for stationary sources of air pollution pursuant to state and federal authority for all stationary projects located within their jurisdiction. Under the California CAA state law, the BAAQMD is required to develop an air quality plan to achieve and/or maintain compliance with federal and state nonattainment AAQS within the air district's boundary.

Bay Area 2017 Clean Air Plan. BAAQMD adopted the Bay Area 2017 Clean Air Plan on April 19, 2017 (BAAQMD 2017a). The 2017 Clean Air Plan provides a regional strategy to protect public health and protect the climate. The 2017 Clean Air Plan updates the most recent Bay Area ozone plan, the 2010 Clean Air Plan, pursuant to air quality planning requirements defined in state law. The 2017 Clean Air Plan defines an integrated, multi-pollutant control strategy to reduce emissions of particulate matter, TACs, ozone and key ozone precursors, and greenhouse gases.

BAAQMD California Environmental Quality Act Guidelines. BAAQMD publishes CEQA Air Quality Guidelines to assist lead agencies in evaluating a project's potential impacts on air quality. The BAAQMD published the most recent version of its CEQA Air Quality Guidelines in May 2017 (BAAQMD 2017b).

BAAQMD Regulation 2, Rule 2: New Source Review (NSR). This rule applies to all new or modified sources requiring an Authority to Construct permit and/or Permit to Operate. The NSR process requires the applicant to use BACT to control emissions if the source will have the PTE of a BAAQMD BACT pollutant in an amount of 10 or more pounds per day (lbs/day). The NSR process also establishes the requirements to offset emissions increases and to protect NAAQS.

For emergency-use diesel engines with output over 1,000 brake horsepower, BAAQMD updated the definition of BACT in December 2020 to reflect the use of engines achieving Tier 4 exhaust standards (BAAQMD 2020); this requires Tier 4-compliant engines that may include Tier 2 engines abated by catalyzed diesel particulate filter (DPF) and selective catalytic reduction (SCR). Each of the 44 diesel back-up emergency generators would be equipped with SCR equipment and DPF to achieve compliance with Tier 4 emission standards. Staff expects the proposed generators would meet the current BAAQMD BACT requirements. However, BAAQMD would make the final determination of BACT during the permitting process.

To prevent sources from worsening regional nonattainment conditions, the NSR rule requires offsets at a 1:1 ratio if more than 10 tpy of NO_X or Precursor Organic Compounds (POC), or more than 100 tpy of PM2.5, PM10, or SO_2, are emitted. If the PTE for NOx or POC is more than 10 tpy but less than 35 tpy, BAAQMD needs to provide any required offsets at 1:1 ratio from the Small Facility Banking Account in BAAQMD's Emissions Bank. If the PTE for NOx or POC is 35 tpy or more, the offset ratio increases to 1.15:1 and offsets can no longer be obtained through the Small Facility Banking Account.

On June 3, 2019, BAAQMD staff issued a new policy to protect the Small Facility Banking Account from over-withdrawal by new emergency backup generator sources. The policy provides procedures, applicable to the determination of access to the Small Facility Banking Account only, for calculating a facility's PTE to determine eligibility for emission reduction credits (ERCs) from the Small Facility Banking Account for emergency backup generators (BAAQMD 2019). When determining the PTE for a facility with emergency backup generators, the PTE shall include as a proxy, emissions proportional to emergency operation for 100 hours per year per standby generator, in addition to the permitted limits for readiness testing and maintenance (generally 50 hours/year or less per standby or backup engine). BAAQMD would not allow an owner/operator to accept a permit condition to limit emergency operation to less than 100 hours per year to reduce the source's PTE for purposes of qualifying for the Small Facility Banking Account.

After comparing the PTE calculated to determine the account eligibility threshold, the amount of offsets required would be determined only upon the permitted emissions from readiness testing and maintenance and not the emissions from emergency operation. Emissions offsets represent ongoing emission reductions that continue every year, year after year, in perpetuity. BAAQMD requires the use of offsets to counterbalance increases in regular and predictable emissions, not increases in emissions occurring infrequently when emergency conditions arise. An owner/operator may reduce the hours of readiness testing and maintenance or install emissions controls to achieve a PTE of less than 35 tons per year (BAAQMD 2019).

BAAQMD Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants. This rule provides for the review of new and modified sources of TAC emissions to evaluate potential public exposure and health risk. Under this rule, a project would be denied an Authority to Construct permit if it exceeds any of the specified risk limits, which are consistent with BAAQMD's recommended significance thresholds. Best Available Control Technology for Toxics (TBACT) would also be required for any new or modified source of TACs where the source has a cancer risk greater than 1.0 in 1 million or a chronic hazard index (HI) greater than 0.20. The specific toxicity values of each TAC for use in an HRA, as identified by California Office of Environmental Health Hazard Assessment (OEHHA), are listed in Table 2-5-1 of BAAQMD Rule 2-5.

BAAQMD Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines. This rule limits NOx and CO emissions from stationary internal combustion engines with an output rated by the manufacturer at more than 50 brake horsepower, including the standby gensets of the project. This regulation (Rule 9-8-231) defines emergency use as "the use of an emergency standby or low usage engine during any of the following:"

- In the event of unforeseeable loss of regular natural gas supply;
- In the event of unforeseeable failure of regular electric power supply;
- Mitigation or prevention of an imminent flood;
- Mitigation of or prevention of an imminent overflow of sewage or waste water;
- Fire or prevention of an imminent fire;
- Failure or imminent failure of a primary motor or source of power, but only for such time as needed to repair or replace the primary motor or source of power; or
- Prevention of the imminent release of hazardous material.

Local

The city of Santa Clara 2010-2035 General Plan (General Plan) includes goals and policies to reduce exposure of the city's sensitive population to the exposure of air pollution and TACs. The following goals, policies, and actions are applicable to the project:

- Air Quality Goals
  - 5.10.2-G1 Improved air quality in Santa Clara and the region.
  - 5.10.2-G2 Reduced greenhouse gas (GHG) emissions that meet the State and regional goals and requirements to combat climate change.

- Air Quality Policies
  - 5.10.2-P1 Support alternative transportation modes and efficient parking mechanisms to improve air quality.
  - 5.10.2-P2 Encourage development patterns that reduce vehicle miles traveled and air pollution.
  - 5.10.2-P3 Encourage implementation of technological advances that minimize public health hazards and reduce the generation of air pollutants.
  - 5.10.2-P4 Encourage measures to reduce GHG emissions to reach 30 percent below 1990 levels by 2020.
  - 5.10.2-P5 Promote regional air pollution prevention plans for local industry and businesses.

- 5.10.2-P6 Require "Best Management Practices" for construction dust abatement.

4.3.3 Environmental Impacts

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

This section considers the project's consistency with the applicable air quality plan (AQP). This is a qualitative determination that considers the combined effects of project construction and operation.

Construction and Operations

Less Than Significant Impact. BAAQMD has permit authority over stationary sources, acts as the primary reviewing agency for environmental documents, and adopts rules that must be consistent with or more stringent than federal and state air quality laws and regulations. The applicable AQP is the Bay Area 2017 Clean Air Plan (BAAQMD 2017a).

A project would be consistent with the AQP if that project (BAAQMD 2017b, pg. 9-2 and 9-3):

1) Supports the primary goals of the AQP.

The determination for this criterion can be met through consistency with the BAAQMD significance thresholds. As can be seen in the discussions under environmental checklist criteria "b" and "c" of this air quality analysis, the project would have less than significant impacts related to the BAAQMD significance thresholds. Therefore, the project would have a less than significant impact related to the primary goals of the AQP.

2) Includes applicable control measures from the AQP.

The project would include the implementation of applicable control measures from the AQP. The project-level applicable control measures set forth in the Bay Area 2017 Clean Air Plan include: Decarbonize Electricity Generation (EN1), Green Buildings (BL1), and Bicycle and Pedestrian Access and Facilities (TR9). The project would comply with these control measures through compliance with General Plan and the city's Climate Action Plan, as demonstrated in more detail in **Section 4.8 Greenhouse Gas Emissions**.

3) Does not disrupt or hinder implementation of any AQP control measures.

Examples of disrupting or hindering implementation of an AQP would be proposing excessive parking or precluding the extension of public transit or bike paths. The project design as proposed is not known to hinder the implementation of any AQP control measure.

The analysis in this section demonstrates that the project emissions would not exceed BAAQMD significance thresholds with NOx emissions fully offset through the permitting process with BAAQMD, as discussed under criterion "b" of the environmental checklist, and the project would not expose sensitive receptors to substantial pollutant concentrations, as discussed under criterion "c" of the environmental checklist. Thus, the project would be consistent with the Bay Area 2017 Clean Air Plan and would have a less than significant impact related to implementation of the applicable AQP.

BAAQMD Regulation 2, Rule 2: New Source Review (NSR). As discussed under criterion "b" of the environmental checklist, the NOx emissions of the gensets during readiness testing and maintenance would be fully offset through the permitting process with BAAQMD. Final details regarding the calculation of the facility's PTE and the ultimate NSR permitting requirements under BAAQMD's Regulation 2, Rule 2, would be determined through the permitting process with BAAQMD. The discussion below explains how the district will calculate the necessary offsets.

b. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

This section quantifies the project's nonattainment criteria pollutant emissions and other criteria pollutant emissions to determine whether the net emissions increase would exceed any of the BAAQMD emissions thresholds for criteria pollutants. TAC effects are not included because this section focuses only on criteria pollutants.

Construction

Less Than Significant with Mitigation Incorporated.

Project demolition/construction would include two phases. The first phase of construction (Phase I) would take approximately 15 months. Phase I construction includes demolition activities, grading and site work installation of utility services for interim power, construction of an on-site substation, construction of the entire shell of the CA3DC building, and placement of approximately one-half of the gensets. The second phase of construction (Phase II) would take approximately seven months. Phase II includes the placement of the remaining half of the gensets and interior buildout (CEC 2022a) Construction-phase emissions are a result of construction equipment, material movement, paving activities, and on-site and off-site vehicle trips, such as material haul trucks, worker commutes, and delivery vehicles.

Emissions from the 22-month construction period were estimated using the California Emissions Estimator Model [4] (CalEEMod) program. The estimated criteria pollutant construction-phase emissions are summarized in **Table 4.3-5**.

4 CalEEMod was developed by the California Air Pollution Control Officers Association in collaboration with California Air Districts. This model is a construction and emissions estimating computer model that estimates direct criteria pollutant and direct and indirect greenhouse gas emissions for a variety of land use projects. The model calculates maximum daily and annual emissions. The model also identifies mitigation measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from measures.

TABLE 4.3-5 CRITERIA POLLUTANT EMISSIONS FROM PROJECT CONSTRUCTION

Pollutant	Average Daily Emissions (lbs/day) [a]		Maximum Annual Construction Emissions (tpy)	BAAQMD Significance Thresholds for Construction-related Average Daily Emissions (lbs/day) [c]	Threshold Exceeded ?
	Phase I	Phase II			
ROG/VOC	15.9	0.3	2.4	54	No
CO	22.5	5.3	3.2	None	N/A
NOx	9.9	0.7	1.5	54	No
SOx	0.06	0.01	0.009	None	N/A
PM10 [b]	0.07 (exhaust) 2.5 (fugitive)	0.02 (exhaust) 0.8 (fugitive)	0.009 (exhaust) 0.4 (fugitive)	82	No
PM2.5 [b]	0.06 (exhaust) 0.8 (fugitive)	0.02 (exhaust) 0.2 (fugitive)	0.009 (exhaust) 0.1 (fugitive)	54	No

Notes:
[a] There are no annual construction-related BAAQMD significance thresholds. BAAQMD's thresholds are average daily thresholds for construction. Accordingly, the average daily emissions are the total estimated construction emissions in each phase averaged over total workdays for that phase.
[b] The average daily PM10 and PM2.5 exhaust emissions are compared to BAAQMD's significance thresholds for exhaust emissions. Fugitive emissions will be controlled with best management practices (BMPs), in accordance with the significance threshold.
[c] BAAQMD 2017b, Table 2-1.
Source: CEC 2022a, CEC staff analysis

The average daily emissions for each phase shown in **Table 4.3-5** indicate that construction emissions would be lower than the applicable BAAQMD significance thresholds for all criteria pollutants.

BAAQMD's numerical thresholds for PM10 and PM2.5 construction-phase emissions apply to exhaust emissions only. BAAQMD has no numerical threshold for fugitive dust generated during construction. The BAAQMD CEQA Guidelines recommend the control of fugitive dust through BMPs to conclude that impacts from fugitive dust emissions are less than significant (BAAQMD 2017b). The applicant proposed measures that would incorporate BAAQMD's recommended construction BMPs as well as exhaust emissions mitigation measures. Staff reviewed the measures and finds them sufficient to address impacts from construction emissions. Staff recommends **AQ-1** to ensure that PM10 and PM2.5 emissions are reduced to a level that would not result in a considerable increase of these pollutants. This impact would be reduced to less than significant with the implementation of **AQ-1**.

Operation

Less Than Significant Impact

Operation emissions would result from diesel fuel combustion from the gensets, off-site vehicle trips for worker commutes and material deliveries, and facility upkeep, such as architectural coatings, consumer product use, landscaping, water use, waste generation, natural gas use for comfort heating, and electricity use (DayZenLLC 2021e). Each of the primary emission sources are described in more detail below.

Stationary Sources – Generator Emissions. The project would include 44 gensets powered by 2.75-MW Caterpillar Model 3516E engines. Each engine would be equipped with SCR and DPF to achieve compliance with Tier 4 emission standards (DayZenLLC 2021a).

All gensets would be operated for routine readiness maintenance and testing to ensure they would function during an emergency event. During routine readiness testing, criteria pollutants and TACs would be emitted directly from the gensets. The applicant used emissions factors provided by Peterson Power Systems for the ecoCUBE engine configuration based on inlet and outlet emission performance (DayZenLLC 2021b). In estimating the annual emissions, the applicant assumed that testing would occur for no more than 35 hours per year averaged over all engines for a total of 1,540 hours. The average daily emissions are estimated by averaging the annual emissions (assuming all generators are operated for 35 hours per year) over the year (i.e. 365 days). The Airborne Toxic Control Measure for Stationary Compression Ignition Engines (CCR, Title 17, Section 93115) limits testing to 50 hours per year per engine. However, it is the applicant's experience that each engine would be operated for considerably less than 50 hours a year. The applicant is proposing an annual readiness testing and maintenance schedule not to exceed 35 hours per year averaged over all engines for a total of 1,540 hours. The NOx emissions are conservatively based on the Tier 2 emissions standards (uncontrolled emission factors), with the conservative assumption that the SCR will not operate during testing and maintenance purposes. Additionally, **GHG-1** could limit this to no more than 20 hours if BAAQMD updates its threshold of significance before this project receives its permit.

Emergency Operations. Emissions that could occur in the event of a power outage or other disruption, upset, or instability that triggers emergency operations would not occur on a regular or predictable basis. However, the BAAQMD 2019 policy, *Calculating Potential to Emit for Emergency Backup Power Generators*, requires a facility's PTE to be calculated based on emissions proportional to emergency operation for 100 hours per year per genset, in addition to the permitted limits for readiness testing and maintenance (BAAQMD 2019). However, after comparing the PTE calculated to determine the account eligibility threshold, the applicant would only be required to offset permitted emissions from readiness testing and maintenance and not the emissions from emergency operation. BAAQMD requires the use of offsets to counterbalance increases in regular and predictable emissions, not increases in emissions occurring infrequently when emergency conditions arise. The potential ambient air quality impacts of emissions during emergency operations are analyzed qualitatively under environmental checklist criterion "c."

Miscellaneous Operational Emissions. Miscellaneous emissions would occur from operational activities, such as worker travel, deliveries, energy and fuel use for facility electrical, heating and cooling needs, periodic use of architectural coatings, and landscaping. The applicant estimated the miscellaneous operational emissions using CalEEMod.

Table 4.3-6 provides the annual and average daily criteria pollutant emission estimates for project operation, including readiness testing and maintenance, using the emission source assumptions noted above. The average daily emissions are based on annual emissions averaged over 365 days per year. The NOx emissions of the gensets are conservatively estimated using Tier 2 emission factors, assuming the SCRs are not effective during readiness testing and maintenance (even though, depending on load, the SCR would be expected to kick on within 15 minutes, providing some additional emissions control for tests that run longer than this). With the conservative assumption of Tier 2 emissions, the NOx PTE of the project would exceed 35 tpy, and, therefore, the NOx emissions would be fully offset by the applicant through the air permitting process at a ratio of 1.15:1. However, in response to staff's Data Request #4, the applicant provided a more refined calculation of the NOx PTE assuming 35 individual 1-hour readiness testing and maintenance, each consisting of 15 minutes of warm up with Tier 2 emissions and 45 minutes with Tier 4 emissions. For the 100 hours of emergency operations (considering the BAAQMD 2019 policy [BAAQMD 2019]), the applicant assumed 15 minutes of uncontrolled emissions and 2 hours and 45 minutes of controlled emissions for every three hours of operation. Total NOx PTE from the applicant's refined calculation would be 28.7 tpy, which is less than 35 tpy (DayZenLLC 2021t). Therefore, the offset ratio would be 1:1 with the refined calculation. The exact amount and the source of the NOx offsets would be confirmed through the permitting process with BAAQMD. When BAAQMD reviews the permit application for the project, it would perform a refined emissions calculation if the applicant provides a detailed testing plan (including testing frequency, duration, and load, etc.) and the specifications from the SCR vendor. If it is uncertain whether the SCR would become effective during readiness testing and maintenance, BAAQMD would also use the most conservative calculation assuming Tier 2 emissions.

Therefore, the NOx emissions and offsets shown in **Table 4.3-6** assuming Tier 2 emissions are conservative estimates. Analysis of Tier 4 emissions would result in less impact than that for the analysis of Tier 2 emissions. Nonetheless, the NOx emissions of the gensets during readiness testing and maintenance would be fully offset through the permitting process with BAAQMD. Emissions from miscellaneous sources are not required to be offset under BAAQMD permitting policy, which only applies to stationary sources.

Table 4.3-6 shows that with NOx emissions from the readiness testing and maintenance of the gensets fully offset through the permitting process with BAAQMD, the project would not exceed any of the BAAQMD emissions significance thresholds. The BAAQMD CEQA Guidelines state that, if the project's daily average or annual emissions of operational-related criteria pollutants or precursors do not exceed any applicable threshold of significance listed in **Table 4.3-1**, the proposed project would not result in a cumulatively significant impact (BAAQMD 2017b). Therefore, **Table 4.3-6** shows that the project would not be expected to result in a cumulatively considerable net increase of criteria pollutants during the lifetime of the project, including the readiness testing and maintenance of the gensets.

In addition to the emissions shown in **Table 4.3-6**, ammonia would also be emitted from the urea used in the SCR system. Ammonia is considered a particulate precursor but not a criteria pollutant. Reactive with sulfur and nitrogen compounds, ammonia is common in the atmosphere primarily from natural sources or as a byproduct of tailpipe controls on motor vehicles. Currently, there are no BAAQMD-recommended models or procedures for estimating secondary particulate nitrate or sulfate formation from individual sources, such as the proposed project. BAAQMD CEQA Guidelines do not include a significance threshold for ammonia emissions. The primary emissions of particulate matter from this project are well below the BAAQMD significance threshold and do not require additional mitigation or trigger the need for offsets. In addition, the applicant conservatively estimated the ammonia emissions of the project to be 0.29 tpy (582 lbs/yr), assuming the SCR is effective for a total of 35 hours per year per engine (DayZenLLC 2021w). However, it would take time for the SCR to warm up, especially during low-load readiness testing and maintenance, and, therefore, actual ammonia emissions would be less than applicant's estimates. Therefore, staff expects the secondary particulate matter impacts from ammonia emissions would be less than significant and would not require additional mitigation or offsets.

The project's operations would not result in a cumulatively considerable net increase of any criteria pollutant, and these impacts would be less than significant.

Cumulative Impacts

According to the 2017 BAAQMD CEQA Guidelines (BAAQMD 2017b), in developing thresholds of significance for air pollutants (as shown in **Table 4.3-1**), BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions.

As discussed above, with the implementation of mitigation measure **AQ-1** during construction and NOx offsets required through the BAAQMD permitting process for readiness testing and maintenance, the project emissions would not exceed the BAAQMD significance thresholds. Therefore, the project would not result in a cumulatively considerable net increase of any criteria pollutant, and these impacts would be less than significant with mitigation incorporated.

TABLE 4.3-6 CRITERIA POLLUTANT EMISSIONS FROM PROJECT READINESS TESTING AND MAINTENANCE

Source Type	ROG/VOC	CO	NOx	SO_2	PM10	PM2.5
	Annual Emissions (tpy)					
Phase I Miscellaneous Operational Emissions	1.14	0.48	0.09	0.001	0.15	0.04
Phase II Miscellaneous Operational Emissions	2.16	0.82	0.16	0.003	0.29	0.08
Standby Generators (Testing Only) [a]	0.44	4.39	35.14 [b]	0.03 [c]	0.14	0.14
Proposed Offsets [d]	--	--	(-40.41)	--	--	--
Total Phase I Net Emissions	1.36	2.68	-2.54	0.02	0.22	0.11
Total Full Buildout Net Emissions	2.60	5.22	-5.11	0.03	0.42	0.22
BAAQMD Annual Significance Thresholds	10	--	10	--	15	10
Net Emissions Exceed BAAQMD Threshold? (Y/N)	N	N/A	N	N/A	N	N
	Average Daily Emissions (lbs/day) [e]					
Phase I Miscellaneous Operational Emissions	6.27	2.63	0.51	0.01	0.83	0.23
Phase II Miscellaneous Operational Emissions	11.82	4.51	0.90	0.01	1.57	0.43
Standby Generators (Testing Only)	2.41	24.07	192.55	0.17	0.75	0.75
Proposed Offsets [c]	--	--	(-221.43)	--	--	--
Total Phase I Net Emissions	7.48	14.67	-13.93	0.09	1.20	0.60
Total Full Buildout Net Emissions	14.24	28.58	-27.98	0.19	2.33	1.18
BAAQMD Average Daily Significance Thresholds	54	--	54	--	82	54
Net Emissions Exceed BAAQMD Threshold? (Y/N)	N	N/A	N	N/A	N	N

Notes:
[a] The annual emissions of the standby generators are estimated assuming readiness testing and maintenance would occur 35 hours per year per engine.
[b] The NOx emissions for readiness testing and maintenance are conservatively estimated based on Tier 2 emission factors.
[c] Staff estimated the SO_2 emissions of the standby generators based on the hourly SO_2 emission rate of from the VDC Supplemental Responses to CEC Data Request Set 2 Air Quality (DayZenLLC 2021t, Table 7-5) assuming readiness testing and maintenance would occur 35 hours per year per engine.
[d] The conservatively estimated NOx emissions of the standby generators would exceed 35 tpy based on Tier 2 emission factors. Therefore, the offset ratio would be 1.15:1 (DayZenLLC 2021e).
[e] The average daily emissions and offsets are based on the annual emissions and offsets averaged over 365 days per year.
Sources: DayZenLLC 2021e, DayZenLLC 2021b, DayZenLLC 2021t with calculation spreadsheets, CEC staff analysis

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

This section quantifies the ambient air quality pollutant concentrations caused by the project and determines whether sensitive receptors could be exposed to substantial pollutant concentrations.

This section is comprised of separate discussions addressing impacts from criteria pollutants in staff's Air Quality Impact Analysis (AQIA) and impacts from TACs in staff's HRA. Staff's AQIA discusses criteria pollutant impacts from construction and operation. The section also discusses issues associated with potential emergency operations. Staff's HRA discusses the results of TACs for both construction and operation (readiness testing and maintenance) and cumulative sources.

Air Quality Impact Analysis for Criteria Pollutants

Staff considers any new AAQS exceedance and substantial contribution to any existing AAQS exceedance caused by the project's emissions to be substantial evidence of potentially significant impacts that would require the evaluation of potential mitigation measures. In this case, the existing background levels of PM10 and PM2.5 already exceed the AAQS.

Construction

Less Than Significant with Mitigation Incorporated. Construction emissions of criteria pollutants are shown in **Table 4.3-5** under criterion "b" of the environmental checklist. Emissions during project construction would not exceed significance thresholds for construction activities, as established in the BAAQMD CEQA Guidelines. With the staff recommendation to implement **AQ-1** to control fugitive dust and exhaust emissions, construction emissions would not exceed the BAAQMD significance thresholds. Although project construction emissions would fall below the emissions thresholds, this section of the staff analysis explores the ambient air quality impacts of criteria pollutant emissions during construction to evaluate whether substantial pollutant concentrations could occur.

In response to staff data requests, the applicant provided the modeled ambient air quality concentrations caused by the construction emissions (DayZenLLC 2021t; TN 239390). Staff reviewed the applicant's dispersion modeling files and agreed with the inputs used by the applicant and the outputs from the model for the construction AQIA for pollutants other than PM10 and PM2.5. This discussion presents the results of staff's independent analysis for PM10 and PM2.5.

The applicant's AQIA uses the U.S. EPA preferred and recommended dispersion model, American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD [version 21112]) to estimate ambient air quality impacts. For certain runs that provide a sum of NO_2 impacts and NO_2 background concentrations, an earlier version of AERMOD (version 19191) was used due to a known bug in the current version of AERMOD (DayZenLLC 2021t, pg. 4). For the 1-hour NO_2 modeling analyses, the applicant used the