DES
DEPARTMENT OF ENVIRONMENT AND SUSTAINABILITY
air quality desert conservation PROGRAM sustainability

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SYNTHETIC MINOR (SM80) SOURCE TECHNICAL SUPPORT DOCUMENT

SOURCE NAME:
Switch Limited

SOURCE ID:
18024

SOURCE LOCATION:
5660 West Badura Avenue
Las Vegas, Nevada 89118

COMPANY NAME:
Switch Limited

APPLICATION PREPARED BY:
Trinity Consultants

CURRENT ACTION:
Significant Revision

APPLICATION RECEIVED:
October 18, 2023

TSD Date: March 14, 2024

TABLE OF CONTENTS

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

(These terms may be seen in the technical support document)

AQR	Clark County Air Quality Regulation
CFR	Code of Federal Regulations
CO	carbon monoxide
DAQ	Division of Air Quality
DOM	date of manufacture
EF	emission factor
EPA	U.S. Environmental Protection Agency
EU	emission unit
HAP	hazardous air pollutant
H_2S	hydrogen sulfide
kW	kilowatt
MMBtu	British thermal units (in millions)
NAICS	North American Industry Classification System
NO_x	nitrogen oxide
Pb	lead
$PM_{2.5}$	particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTE	potential to emit
RACT	reasonably available control technology
RICE	reciprocating internal combustion engine
SCC	Source Classification Codes
SIC	Standard Industrial Classification
SO_2	sulfur dioxide
TDS	total dissolved solids
TSD	Technical Support Document
VAEL	Voluntarily Accepted Emission Limit
VOC	volatile organic compound

Technical Support Document

This TSD establishes the methodology related to the terms and conditions of its Minor Source Permit, issued pursuant to Clark County Department of Air Quality Regulations (AQR) Section 12.1. The TSD shall not serve as the operating authority.

Source Description

Switch Limited is a data center, located in the Hydrographic Area of 212 – Las Vegas Valley. As a data center, the source is classified under SIC 7375: Information Retrieval Services and NAICS 517810: All Other Telecommunications

Switch Limited consists of emergency diesel generators, cooling towers, and an emergency fire pump. Combined, these emission units establish Switch Limited as a synthetic minor (SM80) source of NO_x.

In addition, Switch Limited is subject to the federal requirements of 40 CFR Part 60 Subpart IIII and 40 CFR Part 63 Subpart ZZZZ. However, the source will meet all of the federal requirements of 40 CFR Part 63 Subpart ZZZZ, by adhering to the federal requirements of 40 CFR Part 60 Subpart IIII.

Permitting Action

The permitting action for this source is a significant revision, which will consist of the following:

- adding 15 emergency generators (each rated at 3,058 horsepower), which will be located at the new data center (EUs: A25-A39)
- adding 6 emergency generators (each rated at 3,674 horsepower), which will be located at the new data center (EUs: A40-A45)
- adding 15 cooling towers (each rated at 1,250 gallons per minute), which will be located at the new data center (EUs: C16-C30)
- adding biodiesel and renewable diesel as fuel alternatives for the emergency generators (EUs: A01-A45) and/or the emergency fire pump (EU: B01)
- reclassifying Switch Limited from a synthetic minor source to a synthetic minor (SM80) source for NO_x
- recalculating the emissions for permit applicability and the source potential to emit (PTE), based on the revisions in this permitting action

Emission Units

Table 1 is a comprehensive list of the emission units at this stationary source.

Table 1. List of Emission Units

EU	Rating	Type	Make	MN	SN
A01	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000515
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502448
A02	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000516
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502449
A03	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000512
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502446
A04	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000510
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502440
A05	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000507
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502430
A06	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000514
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502447
A07	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000618
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502532
A08	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000590
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502528
A09	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000617
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502531
A10	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000591
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502529

EU	Rating	Type	Make	MN	SN
A11	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000615
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502530
A12	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000589
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030502527
A13	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000821
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030503153
A14	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000813
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030503093
A15	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000803
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030503136
A16	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000814
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030503164
A17	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000820
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030503138
A18	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	5482000804
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	95030503137
A19	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A20	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A21	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD

EU	Rating	Type	Make	MN	SN
A22	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A23	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A24	2,045 kW	Emergency Generator	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A25	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A26	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A27	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A28	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A29	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A30	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A31	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A32	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD

EU	Rating	Type	Make	MN	SN
A33	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A34	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A35	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A36	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A37	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A38	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A39	2,045 kW	Emergency Generator [1, 2]	MTU	MTU16V4000DS2250	TBD
	3,058 hp	Diesel Engine DOM 2017+	MTU	16V4000G24S	TBD
A40	TBD	Emergency Generator [1, 2]	MTU	TBD	TBD
	3,674 hp	Diesel Engine DOM 2017+	MTU	20V4000G24S	TBD
A41	TBD	Emergency Generator [1, 2]	MTU	TBD	TBD
	3,674 hp	Diesel Engine DOM 2017+	MTU	20V4000G24S	TBD
A42	TBD	Emergency Generator [1, 2]	MTU	TBD	TBD
	3,674 hp	Diesel Engine DOM 2017+	MTU	20V4000G24S	TBD
A43	TBD	Emergency Generator [1, 2]	MTU	TBD	TBD
	3,674 hp	Diesel Engine DOM 2017+	MTU	20V4000G24S	TBD

EU	Rating	Type	Make	MN	SN
A44	TBD	Emergency Generator [1, 2]	MTU	TBD	TBD
	3,674 hp	Diesel Engine DOM 2017+	MTU	20V4000G24S	TBD
A45	TBD	Emergency Generator [1, 2]	MTU	TBD	TBD
	3,674 hp	Diesel Engine DOM 2017+	MTU	20V4000G24S	TBD
B01	138 hp	Emergency Fire Pump	Clarke	JU6H-UFADK0	FPC0002013860101
		Diesel Engine DOM 2017+	John Deere	6068HFC28	PE6068N017744
C01	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	21P107386
C02	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	21P107387
C03	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	21P110032
C04	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	TBD
C05	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	TBD
C06	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	21P110031
C07	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	21P110033
C08	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	21P110034
C09	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	TBD
C10	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	TBD
C11	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	22P118192
C12	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	22P118194
C13	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	22P118309
C14	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	23P131603
C15	1,250 gpm	Cooling Tower	Evapco	ESWA21646OC	TBD
C16	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C17	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C18	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C19	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C20	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C21	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C22	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C23	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD

EU	Rating	Type	Make	MN	SN
C24	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C25	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C26	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C27	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C28	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C29	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD
C30	1,250 gpm	Cooling Tower [1, 2]	Evapco	ESWA21646O	TBD

[1] designates new emission unit

[2] located at new data center

Calculation of Emissions

Applicability

AQR 12.1.0 permitting applicability is determined by calculating the emissions for all proposed emission units using 8,760 hours of operation (except for emergency generators or fire pumps, which use 500 hours), any inherent controls, any inherent throughput limitations, and the emission factors provided by the manufacturer, by source test results, by EPA AP-42, or by other approved methods.

Applicability emissions include emissions from insignificant emission units and activities, but do not include fugitive emissions (except for categorical sources listed in AQR 12.2.2(j) or any other stationary source category that, as of August 7, 1980, is being regulated under Sections 111 or 112 of the Act).

Table 2 shows the thresholds for AQR 12.1.1(d) applicability.

Table 2. AQR 12.1.1(d) Applicability Emissions Evaluation (tons per year)

Pollutant	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	H_2S	Pb	HAP[1]
Applicability Thresholds	5	5	5	25	25	5	1	0.3	n/a
Major Source Thresholds	100	100	100	100	100	100	n/a	100	10/25
Nonattainment NSR Thresholds	100	100	100	100	100	100	n/a	100	n/a
PSD Thresholds	250	250	250	250	250	250	n/a	250	n/a
Applicability Emissions Total	5.27	5.27	437.53	33.94	0.46	23.53	0	0	0.46

[1]10 tons for any single HAP, or 25 tons for any combination of HAP pollutants.

AQR 12.1 is applicable to any stationary source located in Clark County that has the potential to emit (PTE) a regulated air pollutant equal to or greater than the thresholds listed in AQR 12.1.1(d), as shown in Table 3, but less than the major source thresholds listed in AQRs 12.2.2(ff) or 12.3.2(r).

AQR 12.1 is also applicable to any Part 70 source that is exempt from the requirement to obtain a Part 70 operating permit and has a PTE that equals or exceeds the thresholds listed in AQR 12.1.1(d), or to any source that takes a voluntarily accepted emission limit or standard pursuant to AQR 12.1.7 to avoid obtaining a Part 70 operating permit. See the attachment for calculations.

This source exceeds the applicability limit for NO_x, CO, and VOC, so it is required to obtain an air quality permit, as shown in Table 2.

As Table 2 shows, Applicability Emissions are above major source threshold for NO_x, which qualifies this source as a synthetic minor source. (A synthetic minor source is one that has taken a limit to avoid becoming a major source; an SM80 source is a synthetic minor source that has a PTE for one or more pollutants at or above 80% of the major source threshold. The calculations are included as an attachment.)

HAP emissions are also evaluated during the calculation of source status emissions because it is considered a regulated air pollutant. However, the Division of Air Quality (DAQ) has determined that the calculated and/or estimated HAP emissions from this source fall below the AQR 12.1 permitting threshold. Therefore, a specific PTE will not be included in the permit, but any applicable NESHAP and/or MACT requirements will be included in the air quality permit.

PTE

PTE is calculated to include any controls or limits, whether voluntarily proposed by the source or required. PTE does not include insignificant emission units and activities, but does include fugitive emissions.

Table 3 shows the PTE associated with this source, with the calculation sheets provided as attachments at the end of the technical support document.

In addition, Table 3 shows a PTE of 91.27 tons per year of NO_x. This value is below the major source threshold for NO_x (100 tons per year) because the source proposed a voluntary accepted emission limitation (VAEL) on the emergency generators (EUs: A01-A45). This VAEL reduced the PTE of the emergency generators (EUs: A01-A45), which thereby, reduced the overall PTE of the source below the major source threshold for NO_x – 100 tons per year.

Table 3. PTE

PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC
2.57	2.57	91.27	7.24	0.46	4.78

Emission Increase

For this significant revision, the emission increase of NO_x is above the respective threshold for significance (see Table 4). As a result, Switch Limited is required to submit a RACT analysis for this permitting action.

Table 4. Calculation of Emissions Increase (tons per year)

	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	H_2S	Pb
Proposed PTE	2.57	2.57	91.27	7.24	0.46	4.78	0	0
Permitted PTE	1.40	1.40	50.14	3.88	0.25	2.65	0	0
Δ Emissions	1.17	1.17	41.13	3.36	0.21	2.13	0	0
Significance Threshold	7.5	7.5	20	35	40	20	5	0.6
RACT Analysis Required	No	No	Yes	No	No	No	No	No

Emissions Statement

Any stationary source that actually emits a total of 25 tons or more of NO_x and/or 25 tons or more of VOCs is required to submit an annual emissions statement for both pollutants. The statement must provide actual annual NO_x and VOC emissions from all activities, including emission units, insignificant activities, and exempt activities, and will be separate from the emissions inventory (i.e., calculated annual emissions) report permittees submit each year. This requirement shall be a permit condition for any minor source with the potential to emit at least 20 tons of NO_x and/or VOCs, since those sources are the most likely to trigger it.

Control Technology

The cooling towers (EUs: C16-C30) are each equipped with drift eliminators, maintaining a maximum drift rate of 0.001 percent and a TDS content of 5,000 ppm.

The emergency generators (EUs: A25-A45) are subject to the federal requirements of 40 CFR Part 60 Subpart IIII and will adhere to the emission standards, outlined in Subpart IIII. This will satisfy the requirements of what is considered RACT – see Table 5.

In addition, the engines (EUs: A01-A45 and B01) at this source subject to 40 CFR Part 60 Subpart IIII and/or 40 CFR Part 63 Subpart ZZZZ, must meet the fuel requirements referenced therein from 40 CFR Part 1090.305 (in Subpart D). The source must purchase diesel fuel that meets the per-gallon standard of 15 ppm maximum sulfur content, a minimum cetane index of 40, or a maximum aromatic content of 35 volume percent. This permit requires the permittee to monitor or keep records of the sulfur content, cetane index, or aromatic content of the diesel fuel used in the engines.

Operational Limits

Emergency Generators

An operational limit will be included in the air quality permit, limiting each emergency generator (EU: A01-A45) to 104 operating hours per any consecutive 12-month period for nonemergency and emergency use. This operational limit is a VAEL taken by the permittee to avoid major source status.

Emergency Fire Pump

An operational limit will be included in the air quality permit, limiting the emergency fire pump (EU: B01) to 100 operating hours per year for testing, maintenance, and specific nonemergency use. There is no operational limit in the event of an emergency.

In addition, emergency engines (EUs: A01-A45) shall be limited to operating 100 hours per year for testing and maintenance purposes, including nonemergency limitations. On May 1, 2015, the U.S. Court of Appeals for the District of Columbia Circuit issued a decision to vacate provisions in 40 CFR Part 60 Subpart IIII; 40 CFR Part 60 Subpart JJJJ; and 40 CFR Part 63 Subpart ZZZZ that allowed emergency engines to operate for demand response and when there is a deviation of voltage or frequency.

DAQ prohibited sources from operating emergency generators for those activities, consistent with the court decision and EPA's April 15, 2016, implementation memo. On August 10, 2022, EPA published a notice in the *Federal Register* (87 FR 48603) formally promulgating changes to the three CFR subparts listed above. Now, except as provided in 40 CFR Part 60.4211(f)(3)(i), and/or 40 CFR Part 60.4243(d)(3)(i), and/or 40 CFR Parts 63.6640(f)(4)(i) and (ii), the 50 hours per year for nonemergency use cannot be used for peak shavings or nonemergency demand response, or to generate income for a facility by supplying power to an electric grid or to otherwise supply power as part of a financial arrangement with another entity.

Review of Applicable Regulations

The emergency generators and fire pump (EUs: A01-A45 and B01) were each manufactured after the date of applicability – April 1, 2006. As a result, these emission unit are subject to the federal requirements of 40 CFR Part 60 Subpart IIII and 40 CFR Part 63 Subpart ZZZZ.

However, the emergency generators and fire pump (EUs: A01-A45 and B01) will meet all the federal requirements of 40 CFR Part 63 Subpart ZZZZ, by adhering to the federal requirements of 40 CFR Part 60 Subpart IIII.

In addition, the source shall comply with the emissions standards in 40 CFR Part 89.112 and 40 CFR Part 89.113 for the applicable CI engine with the same model year and maximum engine power. The emission standards are provided on the next page in Table 5.

Table 5. Emission Standards for Emergency Engines

EU	Power	NMHC + NOx (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)
A01 – A45	kW > 560	6.40	3.50	0.20
B01	75 ≤ kW < 130	4.00	5.00	0.30

Monitoring

Standard monitoring requirements for opacity, cooling towers, and engines will be included in the air quality permit.

Performance Testing

No performance testing requirements have been identified.

Increment Analysis

Facility Location: 660250, 3992650 (Universal Transverse Mercator (UTM) NAD83)

Switch Ltd is a minor source in Hydrographic Area 212 (the Las Vegas Valley). Permitted emission units include 45 generators, one fire pump, and 30 cooling towers. Since minor source baseline dates for NO_x (October 21, 1988) and SO_2 (June 29, 1979) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

DAQ modeled the source using AERMOD to track the increment consumption. Stack data submitted by the applicant were used in the model. Five years (2011 to 2015) of meteorological data from the McCarran Station were used in the model. U.S. Geological Survey National Elevation Dataset terrain data were used to calculate elevations. Table 6 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table 6. PSD Increment Consumption

Pollutant	Averaging Period	Source's PSD Increment Consumption (µg/m³)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO_2	3-hour	6.08[1]	660011	3992608
SO_2	24-hour	3.11[1]	660374	3992608
SO_2	Annual	1.77	660374	3992608
NO_x	Annual	20.04	660374	3992608

[1] Highest Second High Concentration.

Public Participation

This permitting action will be posted on the department's website for the general public to view and comment, pursuant to AQR 12.1.5.3(a)(1)(C) – a significant revision that is required because of a significant increase in an existing minor source's potential to emit.

Attachments

See calculation sheets as attachments on next page.

Attachment 1. Emissions for Permit Applicability (EU: A01-A24)

EU#	A01-A24		**Horsepower:**	3,058		**Emission Factor (lb/hp-hr)**	**Control Efficiency**	**Potential Emissions**	
Make:			**Hours/Day:**	24.0				**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	500	**PM10**	1.10E-04	0.00%	0.34	8.09	0.08
S/N:					**NOx**	1.31E-02	0.00%	39.91	957.87	9.98
					CO	9.70E-04	0.00%	2.97	71.19	0.74
Manufacturer Guarantees					**SO_2**	1.21E-05	0.00%	0.04	0.89	0.01
PM10	0.05	g/hp-hr			**VOC**	7.05E-04	0.00%	2.16	51.74	0.54
NOx	5.92	g/hp-hr			**HAP**	1.10E-05	0.00%	0.03	0.81	0.01
CO	0.44	g/hp-hr								
SO_2		lb/hp-hr								
VOC		g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

*based on emission factors from the manufacturer, except for SO_2 and VOC (AP-42)

Attachment 2. Emissions for Permit Applicability (EUs: A25-39)

EU#	A25-A39		**Horsepower:**	3,058		**Emission Factor (lb/hp-hr)**	**Control Efficiency**	**Potential Emissions**	
Make:			**Hours/Day:**	24.0				**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	500	**PM10**	8.82E-05	0.00%	0.27	6.47	0.07
S/N:					**NOx**	1.13E-02	0.00%	34.45	826.81	8.61
					CO	9.92E-04	0.00%	3.03	72.81	0.76
Manufacturer Guarantees					**SO_2**	1.21E-05	0.00%	0.04	0.89	0.01
PM10	0.04	g/hp-hr			**VOC**	5.95E-04	0.00%	1.82	43.69	0.46
NOx	5.11	g/hp-hr			**HAP**	1.10E-05	0.00%	0.03	0.81	0.01
CO	0.45	g/hp-hr								
SO_2		g/hp-hr								
VOC	0.27	g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

*based on emission factors from the manufacturer, except for SO_2 (AP-42)

Attachment 3. Emissions for Permit Applicability (EUs: A40-A45)

EU#	A40-A45		**Horsepower:**	3,674		**Emission Factor (lb/hp-hr)**	**Control Efficiency**	**Potential Emissions**	
Make:			**Hours/Day:**	24.0				**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	500	**PM10**	8.82E-05	0.00%	0.32	7.78	0.08
S/N:					**NOx**	1.25E-02	0.00%	45.76	1098.34	11.44
					CO	8.16E-04	0.00%	3.00	71.93	0.75
Manufacturer Guarantees					**SO_2**	1.21E-05	0.00%	0.04	1.07	0.01
PM10	0.04	g/hp-hr			**VOC**	6.61E-04	0.00%	2.43	58.32	0.61
NOx	5.65	g/hp-hr			**HAP**	1.10E-05	0.00%	0.04	0.97	0.01
CO	0.37	g/hp-hr								
SO_2		g/hp-hr								
VOC	0.3	g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

*based on emission factors from the manufacturer, except for SO_2 (AP-42)

Attachment 4. Emissions for Permit Applicability and Source PTE (EU: B01)

EU#	B01		**Horsepower:**	125		**Emission Factor**	**Potential Emissions**		
Make:			**Hours/Day:**	24.0		**(lb/hp-hr)**	**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	500	**PM10**	2.79E-04	0.03	0.84	0.01
S/N:					**NOx**	5.59E-03	0.70	16.77	0.17
					CO	2.14E-03	0.27	6.41	0.07
Manufacturer Guarantees					**SO_2**	1.21E-05	0.01	0.04	0.01
PM10	0.17	g/kW-hr			**VOC**	3.29E-04	0.04	0.99	0.01
NOx	3.4	g/kW-hr			**HAP**	2.71E-05	0.01	0.08	0.01
CO	1.3	g/kW-hr							
SO_2		g/kW-hr							
VOC	0.2	g/kW-hr							
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)				

*based on emission factors from the manufacturer, except for SO_2 (AP-42)

Attachment 5. Emissions for Permit Applicability and Source PTE (EUs: C01-C30)

EU	Description	Drift Loss % (1)	Flow Rate (gal/min)	TDS (mg/l)	Hours of Operation		PM10 Emissions		PM2.5 Emissions	
					hr/day	hr/yr	lb/hr	ton/yr	lb/hr	ton/yr
C01	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C02	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C03	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C04	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C05	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C06	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C07	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C08	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C09	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C10	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C11	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C12	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C13	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C14	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C15	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C16	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C17	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C18	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C19	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C20	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C21	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C22	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C23	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C24	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C25	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C26	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C27	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C28	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C29	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06
C30	Cooling Tower	0.001%	1250	5000	24	8760	0.01	0.06	0.01	0.06

Attachment 6. Source PTE (EUs: A01-A24)

EU#	A01-A24		**Horsepower:**	3,058		**Emission Factor (lb/hp-hr)**	**Control Efficiency**	**Potential Emissions**	
Make:			**Hours/Day:**	24.0				**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	104	**PM10**	1.10E-04	0.00%	0.34	8.09	0.02
S/N:					**NOx**	1.31E-02	0.00%	39.91	957.87	2.08
					CO	9.70E-04	0.00%	2.97	71.19	0.15
Manufacturer Guarantees					**SO_2**	1.21E-05	0.00%	0.04	0.89	0.01
PM10	0.05	g/hp-hr			**VOC**	7.05E-04	0.00%	2.16	51.74	0.11
NOx	5.92	g/hp-hr			**HAP**	1.10E-05	0.00%	0.03	0.81	0.01
CO	0.44	g/hp-hr								
SO_2		g/hp-hr								
VOC		g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

*based on emission factors from the manufacturer, except for SO_2 and VOC (AP-42)

Attachment 7. Source PTE (EUs: A25-A39)

EU#	A25-A39		**Horsepower:**	3,058		**Emission Factor (lb/hp-hr)**	**Control Efficiency**	**Potential Emissions**	
Make:			**Hours/Day:**	24.0				**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	104	**PM10**	8.82E-05	0.00%	0.27	6.47	0.01
S/N:					**NOx**	1.13E-02	0.00%	34.45	826.81	1.79
					CO	9.92E-04	0.00%	3.03	72.81	0.16
Manufacturer Guarantees					**SO_2**	1.21E-05	0.00%	0.04	0.89	0.01
PM10	0.04	g/hp-hr			**VOC**	5.95E-04	0.00%	1.82	43.69	0.09
NOx	5.11	g/hp-hr			**HAP**	1.10E-05	0.00%	0.03	0.81	0.01
CO	0.45	g/hp-hr								
SO_2		g/hp-hr								
VOC	0.27	g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

*based on emission factors from the manufacturer, except for SO_2 and VOC (AP-42)

Attachment 8. Source PTE (EUs: A40-A45)

EU#	A40-A45		**Horsepower:**	3,674		**Emission Factor (lb/hp-hr)**	**Control Efficiency**	**Potential Emissions**	
Make:			**Hours/Day:**	24.0				**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	104	**PM10**	8.82E-05	0.00%	0.32	7.78	0.02
S/N:					**NOx**	1.25E-02	0.00%	45.76	1098.34	2.38
					CO	8.16E-04	0.00%	3.00	71.93	0.16
Manufacturer Guarantees					**SO_2**	1.21E-05	0.00%	0.04	1.07	0.01
PM10	0.04	g/hp-hr			**VOC**	6.61E-04	0.00%	2.43	58.32	0.13
NOx	5.65	g/hp-hr			**HAP**	1.10E-05	0.00%	0.04	0.97	0.01
CO	0.37	g/hp-hr								
SO_2		g/hp-hr								
VOC	0.3	g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

*based on emission factors from the manufacturer, except for SO_2 and VOC (AP-42)

Attachment 9. Emissions for Permit Applicability – Summary (tons per year)

EU	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP
A01	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A02	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A03	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A04	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A05	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A06	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A07	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A08	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A09	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A10	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A11	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A12	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A13	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A14	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A15	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A16	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A17	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A18	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A19	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A20	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A21	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A22	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A23	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A24	0.08	0.08	9.98	0.74	0.01	0.54	0.01
A25	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A26	0.07	0.07	8.61	0.76	0.01	0.46	0.01

EU	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP
A27	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A28	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A29	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A30	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A31	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A32	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A33	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A34	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A35	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A36	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A37	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A38	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A39	0.07	0.07	8.61	0.76	0.01	0.46	0.01
A40	0.08	0.08	11.44	0.75	0.01	0.61	0.01
A41	0.08	0.08	11.44	0.75	0.01	0.61	0.01
A42	0.08	0.08	11.44	0.75	0.01	0.61	0.01
A43	0.08	0.08	11.44	0.75	0.01	0.61	0.01
A44	0.08	0.08	11.44	0.75	0.01	0.61	0.01
A45	0.08	0.08	11.44	0.75	0.01	0.61	0.01
B01	0.02	0.02	0.22	0.28	0.01	0.01	0.01
C01	0.06	0.06	0	0	0	0	0
C02	0.06	0.06	0	0	0	0	0
C03	0.06	0.06	0	0	0	0	0
C04	0.06	0.06	0	0	0	0	0
C05	0.06	0.06	0	0	0	0	0
C06	0.06	0.06	0	0	0	0	0
C07	0.06	0.06	0	0	0	0	0

EU	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP
C08	0.06	0.06	0	0	0	0	0
C09	0.06	0.06	0	0	0	0	0
C10	0.06	0.06	0	0	0	0	0
C11	0.06	0.06	0	0	0	0	0
C12	0.06	0.06	0	0	0	0	0
C13	0.06	0.06	0	0	0	0	0
C14	0.06	0.06	0	0	0	0	0
C15	0.06	0.06	0	0	0	0	0
C16	0.06	0.06	0	0	0	0	0
C17	0.06	0.06	0	0	0	0	0
C18	0.06	0.06	0	0	0	0	0
C19	0.06	0.06	0	0	0	0	0
C20	0.06	0.06	0	0	0	0	0
C21	0.06	0.06	0	0	0	0	0
C22	0.06	0.06	0	0	0	0	0
C23	0.06	0.06	0	0	0	0	0
C24	0.06	0.06	0	0	0	0	0
C25	0.06	0.06	0	0	0	0	0
C26	0.06	0.06	0	0	0	0	0
C27	0.06	0.06	0	0	0	0	0
C28	0.06	0.06	0	0	0	0	0
C29	0.06	0.06	0	0	0	0	0
C30	0.06	0.06	0	0	0	0	0
Total	5.27	5.27	437.53	33.94	0.46	23.53	0.46

Attachment 10. Source PTE – Summary (tons per year)

EU	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP
A01	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A02	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A03	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A04	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A05	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A06	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A07	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A08	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A09	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A10	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A11	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A12	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A13	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A14	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A15	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A16	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A17	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A18	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A19	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A20	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A21	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A22	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A23	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A24	0.02	0.02	2.08	0.15	0.01	0.11	0.01
A25	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A26	0.01	0.01	1.79	0.16	0.01	0.09	0.01

EU	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP
A27	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A28	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A29	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A30	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A31	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A32	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A33	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A34	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A35	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A36	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A37	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A38	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A39	0.01	0.01	1.79	0.16	0.01	0.09	0.01
A40	0.02	0.02	2.38	0.16	0.01	0.13	0.01
A41	0.02	0.02	2.38	0.16	0.01	0.13	0.01
A42	0.02	0.02	2.38	0.16	0.01	0.13	0.01
A43	0.02	0.02	2.38	0.16	0.01	0.13	0.01
A44	0.02	0.02	2.38	0.16	0.01	0.13	0.01
A45	0.02	0.02	2.38	0.16	0.01	0.13	0.01
B01	0.02	0.02	0.22	0.28	0.01	0.01	0.01
C01	0.06	0.06	0	0	0	0	0
C02	0.06	0.06	0	0	0	0	0
C03	0.06	0.06	0	0	0	0	0
C04	0.06	0.06	0	0	0	0	0
C05	0.06	0.06	0	0	0	0	0
C06	0.06	0.06	0	0	0	0	0
C07	0.06	0.06	0	0	0	0	0

EU	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP
C08	0.06	0.06	0	0	0	0	0
C09	0.06	0.06	0	0	0	0	0
C10	0.06	0.06	0	0	0	0	0
C11	0.06	0.06	0	0	0	0	0
C12	0.06	0.06	0	0	0	0	0
C13	0.06	0.06	0	0	0	0	0
C14	0.06	0.06	0	0	0	0	0
C15	0.06	0.06	0	0	0	0	0
C16	0.06	0.06	0	0	0	0	0
C17	0.06	0.06	0	0	0	0	0
C18	0.06	0.06	0	0	0	0	0
C19	0.06	0.06	0	0	0	0	0
C20	0.06	0.06	0	0	0	0	0
C21	0.06	0.06	0	0	0	0	0
C22	0.06	0.06	0	0	0	0	0
C23	0.06	0.06	0	0	0	0	0
C24	0.06	0.06	0	0	0	0	0
C25	0.06	0.06	0	0	0	0	0
C26	0.06	0.06	0	0	0	0	0
C27	0.06	0.06	0	0	0	0	0
C28	0.06	0.06	0	0	0	0	0
C29	0.06	0.06	0	0	0	0	0
C30	0.06	0.06	0	0	0	0	0
Total	2.57	2.57	91.27	7.24	0.46	4.78	0.46