

**DRAFT ENGINEERING EVALUATION  
DIGITAL ALFRED LLC  
PLANT 20326  
APPLICATION 28743  
3205 ALFRED ST., SANTA CLARA, CA 95054**

**BACKGROUND**

Digital Alfred, LLC is applying for an Authority to Construct and/or Permit to Operate seven new emergency standby generators.

- S-1 Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-1 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-2 Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-2 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-3 Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-3 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-4 Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-4 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-5 Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-5 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-6 Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-6 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-7 Emergency Standby Diesel Generator Set; Make: Cummins; Model: 230DSHAD; Model Year: 2008; Max Rated Horsepower: 364 hp; Abated by A-7 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**

The engines will be within 1000 feet of the property boundary of Granada Islamic School (500 ft). Thus, Digital Alfred, LLC is subject to the public notice requirements in the District Regulation 2-1-412.

**EMISSIONS SUMMARY**

**Annual and Maximum Daily Emissions:**

**Basis:**

- Emission factors for S-1 to S-7 for nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), precursor organic compounds (POC), and particulate matter less than 10 microns in diameter (PM<sub>10</sub>) were provided by the manufacturer.
- S-1 to S-6 has an EPA Engine Family Name FCEXL060.AAD, and is certified to meet the EPA Tier 2. Emission factors were calculated using the manufacturer's emission testing data submitted to EPA for certification.
- S-7 has an EPA Engine Family Name 8CEXL0540.AAB, and is certified to meet the EPA Tier 3. Emission factors were calculated using the manufacturer's emission testing data submitted to EPA for certification.
- 85% PM reduction was assumed for S-1 to S-7 based on the CARB Executive Order DE-07-001-06.

The emission factor for sulfur dioxide (SO<sub>2</sub>) is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors, which is based on full conversion of fuel sulfur to SO<sub>2</sub> and which will therefore be considered applicable to any diesel engine (sulfur content will be assumed to be the California limit of 0.0015 wt% sulfur):

$$\text{SO}_2: 8.09\text{E-}3 (\% \text{ S in fuel oil}) \text{ lb/hp-hr} = 8.09\text{E-}3 (0.0015\% \text{ S}) (454 \text{ g/lb}) = 0.0055 \text{ g/hp-hr}$$

Daily emissions are calculated to establish whether a source triggers the requirement for Best Available Control Technology (10 lb/highest day total source emissions for any class of pollutants). A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations. Annual and maximum daily emissions for S-1 to S-6 and S-7 are presented in Table 1 and 2, respectively.

**Table 1 – Annual and Maximum Daily Emissions for S-1 to S-6**

Max Rated Output (bhp)	Fuel Use Rate (gal/hr)	Fuel Use Rate (MMBTU/hr)	Pollutant	Abated Emission Factors (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (TPY)
2922	135	18.09	NO <sub>x</sub>	3.61	558.13	1162.77	0.581
			CO	0.75	115.95	241.57	0.121
			POC	0.19	29.38	61.20	0.031
			PM <sub>10</sub>	0.0135	2.09	4.35	0.002
			SO <sub>2</sub>	0.0055	0.85	1.77	0.001

**Table 2 – Annual and Maximum Daily Emissions for S-7**

Max Rated Output (bhp)	Fuel Use Rate (gal/hr)	Fuel Use Rate (MMBTU/hr)	Pollutant	Abated Emission Factors (g/bhp-hr)	Max Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (TPY)
364	18.2	2.44	NO <sub>x</sub>	2.76	53.21	110.76	0.055
			CO	2.46	47.39	98.65	0.049
			POC	0.15	2.80	5.83	0.003
			PM <sub>10</sub>	0.0168	0.32	0.67	0.000
			SO <sub>2</sub>	0.0055	0.85	1.77	0.001

**PLANT CUMULATIVE INCREASE**

The cumulative increase for Digital Alfred, LLC is presented in Table 3.

**Table 3 – Cumulative Increase for Digital Alfred LLC (Plant #20326)**

Pollutant	Current (TPY)	Application Increase (TPY)	New Total (TPY)
NO <sub>x</sub>	4.356	3.544	7.900
CO	0.382	0.774	1.156
POC	0.225	0.187	0.412
PM <sub>10</sub>	0.008	0.013	0.021
SO <sub>2</sub>	0.000	0.006	0.006

**HEALTH RISK ASSESSMENT (HRA)**

The calculated emissions increase of diesel exhaust particulate matter associated with the engine are in excess of the chronic risk screening trigger (0.26 lb/yr) as set forth in Regulation 2, Rule 5 as shown below.

Source	Operating Hours (hr/yr)	Max Rated Output (bhp)	Abated PM Emission Factor (g/hp-hr)	Annual PM Emissions (lb/yr)
S-1	50	2922	0.0135	4.35
S-2	50	2922	0.0135	4.35
S-3	50	2922	0.0135	4.35
S-4	50	2922	0.0135	4.35
S-5	50	2922	0.0135	4.35
S-6	50	2922	0.0135	4.35
S-7	50	364	0.0168	0.67
<b>Total</b>				26.76

S-1 to S-7 meets Best Available Control Technology for toxics (TBACT) since the diesel particulate emissions are less than 0.15 g/bhp-hr. For a project with engines that meet the TBACT requirement, it must also pass the toxic risk screening level of less than 10 in one million for cancer risk, 1 for chronic hazard index, and 1 for acute hazard index. Estimates of residential risk assume exposure to annual average toxic air contaminant concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for offsite workers assume exposure occurs 8 hours per day, 245 days per year, for 40 years. Risk estimates for students assume a higher breathing rate, and exposure is assumed to occur 10 hours per day, 36 weeks per year, for 9 years.

Based on 50 hours per year of operation, the emergency generator set passed the HRA conducted on August 14, 2017 by the District's Toxic Evaluation Section. The increased cancer risk to the maximally exposed receptor (worker) is 1.1 in a million. The increased chronic non-cancer hazard index to the maximally exposed receptor (worker) is 0.00084. The increased cancer risk and chronic non-cancer hazard index is negligible to the student receptors. In accordance with the District's Regulation 2-5, this risk level is considered acceptable, as it has been determined that S-1 to S-7 meets the current TBACT standards.

**STATEMENT OF COMPLIANCE**

The owner/operator of S-1 to S-7 shall comply with Regulation 6-1 (Particulate Matter and Visible Emissions Standards), Regulation 9-1 (Inorganic Gaseous Pollutants: Sulfur Dioxide), and Regulation 9-8 (Inorganic Gaseous Pollutants: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines).

Regulation 6-1-303 (Ringelmann No.2 Limitation) limits opacity from internal combustion engines to Ringelmann No. 2. Regulation 6-1-305 (Visible Particles) prohibit emission of emission particles large enough to be visible as individually at the emission point. Regulation 6-1-310 (Particle Weight Limitation) limits emissions from any source particulate in excess of 343 mg per dry standard cubic meter. S-1 to S-7 are equipped with diesel particulate filter and will be fueled using ultra-low sulfur diesel. Thus, the engines are expected to comply with Regulation 6-1.

Regulation 9-1-301 (Limitations on Ground Level Concentrations) prohibits emissions from any sources other than ships, SO<sub>2</sub> in quantities which result in ground level concentrations in excess of 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes or 0.05 ppm averaged over 24 hours. Ultra-low sulfur diesel (15 PPM sulfur) will be used to meet the sulfur limitation

of 0.5 wt% in Regulation 9-1-304 (Fuel Burning) as well as to minimize SO<sub>2</sub> emissions to comply with Regulation 9-1-301. Thus, S-1 to S-7 are expected to comply with Regulation 9-1.

Because S-1 is an emergency standby generator, Regulation 9-8-110 (Inorganic Gaseous Pollutants: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines) exempts the engines from the emission limits in Sections 9-8-301 through 305. Allowable operating hours and the corresponding record keeping in Regulation 9-8-330 (Emergency Standby engines, Hours of Operation) and 530 (Emergency Standby and Low Usage Engines, Monitoring and Recordkeeping) will be included in the permit conditions. Thus, S-1 to S-7 are expected comply with Regulation 9-8.

The diesel engines are subject to the Stationary Diesel Airborne Toxics Control Measure (ATCM) and are considered new stationary emergency standby diesel engine since it will be installed after January 1, 2005 and is larger than 50 hp. The requirements of the ATCM will be included in the permit conditions.

The project is considered to be ministerial under the District's California Environmental Quality Act (CEQA) Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors outlined in the Permit Handbook Chapter 2.3.1 and therefore is not discretionary as defined by CEQA.

The project is within 1000 feet from the nearest school and therefore is subject to the public notification requirements of Reg. 2-1-412. Notifications will be distributed to parents or guardians of children enrolled at Granada Islamic School within ¼ mile, and all residential and business neighbors within 1,000 feet of the proposed new source.

**Best Available Control Technology (BACT):**

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>.

Based on the emission calculations above, the owner/operator of S-1 to S-6 is subject to BACT for NO<sub>x</sub>, CO, and POC. S-7 is subject to BACT for NO<sub>x</sub> and CO. The District's BACT requirements for "IC Engine - Compression Ignition: Stationary Emergency > 50 bhp" are addressed in the BACT Guideline, document # 96.1.3, revision 7, dated December 22, 2010.

The BACT2 requirements are 4.8 g/bhp-hr for NMHC+NO<sub>x</sub>, 2.6 g/bhp-hr for CO, and 0.15 g/bhp-hr for PM for engines with maximum power greater than 750 HP. According to the emission data in the EPA database for the engine family for S-1 to S-6, S-1 to S-6 meets the BACT2 requirements.

The BACT2 requirements are 3.0 g/bhp-hr for NMHC+NO<sub>x</sub>, 2.6 g/bhp-hr for CO, and 0.15 g/bhp-hr for PM for engines with maximum power between 300 and 600 HP. According to the emission data in the EPA database for the engine family for S-7, S-7 meets the BACT2 requirements.

**Offsets:**

Offsets must be provided for any new or modified source at a facility that emits more than 10 tons per year of POC or NO<sub>x</sub>. Since the facility's permitted emissions are less than 10 tons per year of POC or NO<sub>x</sub>, offset is not required.

**New Source Performance Standards (NSPS):**

The engines are subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after April 1, 2006, as required by Section 60.4200(a)(2)(i).

Each engine, S-1 to S-6, has a total displacement of 60.2 liters and 16 cylinders. Therefore, each cylinder has a volume of less than 10 liters. The engines are 2015 engines and are not a fire pump. Section 60.4205(b) requires these engines to comply with the standards in Section 60.4202 that apply to the same model year and maximum engine power. For engines above 50 hp, below 3000 hp, and that have a

displacement less than 10 liters per cylinder, the requirement is to comply with the certification standards in 40 CFR 89.112 and 89.113 for all pollutants.

For engines greater than 700 hp, the standards in Section 89.112 are:

- NMHC + NO<sub>x</sub>: 4.8 g/hp-hr
- CO: 2.6 g/hp-hr
- PM: 0.15 g/hp-hr

S-7 has a total displacement of 8.9 liters and 4 cylinders. Therefore, each cylinder has a volume of less than 10 liters. The engine is a 2018 engine and is not a fire pump. Section 60.4205(b) requires these engines to comply with the standards in Section 60.4202 that apply to the same model year and maximum engine power. For engines above 50 hp, below 3000 hp, and that have a displacement less than 10 liters per cylinder, the requirement is to comply with the certification standards in 40 CFR 89.112 and 89.113 for all pollutants.

For engines between 300 and 600 hp, the standards in Section 89.112 are:

- NMHC + NO<sub>x</sub>: 3.0 g/hp-hr
- CO: 2.6 g/hp-hr
- PM: 0.15 g/hp-hr

Section 89.113 states that the exhaust opacity must not exceed:

- 20 percent during acceleration
- 15 percent during lugging
- 50 percent during peaks in acceleration or lugging modes

Since the engines have been certified by EPA, they will comply with the above standards.

The owner/operator is expected to comply with Sections 60.4206 and 60.4211(a), which require that the owner/operator operate and maintain the engine according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

Section 60.4209(a) requires a non-resettable hour meter. This requirement is already in the standard permit conditions.

The engines will comply with the requirement in Section 60.4211(e) to run for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing because the facility is limited by permit condition to 50 hours per year for reliability testing and otherwise may only operate for emergencies.

The owner/operator is not required to perform tests in accordance with Section 60.4212 or 60.4213.

Section 60.4214 states that owner/operator does not have to submit an initial notification to EPA for emergency engines.

Because the engines have a diesel particulate filter, it is expected to comply with Section 60.4214(c).

The owner/operator is required to comply with certain sections of 40 CFR 60, Subpart A, General Provisions.

**Prevention of Significant Deterioration (PSD):**

The emission increase resulting from this project is expected to be less than 1 TPY for any class of pollutants. Since it is far below the PSD thresholds, the project is not subject to PSD review.

**National Emission Standards for Hazardous Air Pollutants (NESHAP)**

The engines are subject to the emission or operating limitations in 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. Because they are new engines at an area source, the engines must meet the requirements in 40 CFR part 60 subpart IIII and no further requirements apply to this engine under this subpart according to §63.6590(c)(1).

**PERMIT CONDITIONS**

S-1 to S-7 will be subject to Permit Condition Numbers 22850 and 24354 as shown below.

## Permit Condition #22850

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.  
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection 93115.6 (b)(3)(A)(1)(a)]
2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited.  
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection 93115.6 (b)(3)(A)(1)(a)]
3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.  
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection 93115.10 (e)(1)]
4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
  - a. Hours of operation for reliability-related activities (maintenance and testing).
  - b. Hours of operation for emission testing to show compliance with emission limits.
  - c. Hours of operation (emergency).
  - d. For each emergency, the nature of the emergency condition.
  - e. Fuel usage for each engine(s).

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection 93115.10 (g) (or, Regulation 2-6-501)]

5. At School and Near-School Operation:

If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:

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

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

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

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection 93115.6 (b)(2)]

Permit Condition #24354

1. The owner/operator shall abate the particulate emissions from the emergency diesel engine with a Diesel Particulate Filter at all times the engine is in operation.

[Basis: "ATCM for Stationary Compression Ignition Engines" Section 93115.6(a)(3) or 93115.6(b)(3), title 17, CA Code of Regulations]

2. The owner/operator shall install and maintain a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. The owner/operator shall maintain records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached in a District-approved log for at least 36 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit).

[Basis: "ATCM for Stationary Compression Ignition Engines" Section 93115.10(e), title 17, CA Code of Regulations; 40 CFR 60.4214c]

**RECOMMENDATION**

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of the Authority to Construct for the following source:

- S-1    Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-1 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-2    Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-2 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-3    Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-3 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-4    Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-4 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-5    Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-5 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-6    Emergency Standby Diesel Generator Set; Make: Cummins; Model: 2000DQKAE; Model Year: 2015; Max Rated Horsepower: 2922 hp; Abated by A-6 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**
- S-7    Emergency Standby Diesel Generator Set; Make: Cummins; Model: 230DSHAD; Model Year: 2008; Max Rated Horsepower: 364 hp; Abated by A-7 Diesel Particulate Filter; Make: Rypos; Model: HDPF/C;**

By: \_\_\_\_\_

Alexander Sohn  
Air Quality Engineer

Date: \_\_\_\_\_