

ENGINEERING EVALUATION
Nextel of California, Inc DBA Sprint
Plant: 20815
Application: 23467

BACKGROUND

Nextel of California, Inc DBA Sprint has applied to obtain a Permit to Operate the following equipment:

S-1 Emergency Standby Diesel Generator Set
John Deere, 3029TF270D, Model Year 2004
64 BHP, 0.42MMBTU/hr

located at 1500 Benicia Road, Vallejo, CA 94589

S-1 has been registered with the Statewide Portable Equipment Registration Program (PERP) under Registration #130912 since 2005, and S-1 is currently holding a Registration from CARB, thus S-1 is exempt from a Permit per Regulation 2-1-105 (Exemption, Registered Statewide Portable Equipment).

This application is intended to convert the portable engine to a Stationary Emergency Engine. As soon as S-1 is converted to a Stationary Emergency Engine, the exempt under Regulation 2-1-105 will be no longer valid, and S-1 will be required for a Permit.

Per Regulation 2-1-220.10, the District allows portable engines to convert to stationary units, "if this equipment remains at any fixed location for more than twelve months, the portable permit will automatically revert to a conventional permanent location permit and will lose its portability."

S-1 is subject to the Regulation 2 rule 5 Toxics Review per Regulation 2-1-220.5.

Also, S-1 is subject to Public Notification requirements per Regulation 2-1-220.4, and the equipment is not operated within 1000 feet of the outer boundary of any K-12 school site, unless the applicable notice requirements of Health and Safety Code Section 42301.6 have been met.

The criteria pollutants are nitrogen oxides (NO_x), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO₂) and particulate matter (PM₁₀). POC is also denoted as NMHC (non-methane hydrocarbon). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

EMISSIONS

S-1 has been certified by CARB to be a cleaner burning engine. Except for SO₂, the emission factors for these engines are from the CARB Executive Order #U-R-004-0166. The SO₂ emissions were calculated based on the maximum allowable sulfur content (0.0015 wt% S) of the diesel fuel with assumption that all of the sulfur present will be converted to SO₂ during the combustion process. The POC emission factor is assumed to be 5% of the total NO_x and POC (NMHC+NO_x) factor based on District Policy.

Annual Average Emissions for S-1

Basis:

64 hp output rating

50 hr/yr operation for testing and maintenance

3.1 gallons/hr max fuel use rate

NMHC + NO_x, CO and PM₁₀ emission factors are provided by the CARB Executive Order #U-R-004-0166.

POC is assumed to be 5% of NMHC + NO_x

NO_x is assumed to be 95% of NMHC + NO_x

SO₂ emissions are quantified based on the full conversion of 0.0015 wt% (~ 15 ppm) sulfur in the ULS diesel fuel.

The SO₂ emission factor was derived from EPA AP-42, Table 3.4-1.

Annual Emissions:

Annual emissions are calculated based on the number of hours per year of operation for testing and maintenance. See Table 1.

Daily Emissions:

Daily emissions are calculated to establish whether a source triggers the requirement for BACT (10 lb/highest day total source emissions for any class of pollutants). 24-hr/day of operation will be assumed since no daily limits are imposed on intermittent and unexpected operations. See Table 1.

Table 1

Pollutant	Emission Factor (g/kW-hr)	Emission Factor (g/hp-hr)	Annual Emissions (lb/yr)	Annual Emissions (TPY)	Max. Daily Emissions (lb/day)
NMHC+NO _x	6.50	4.85			
NO _x	6.18	4.61	32.47	0.0162	15.59
POC	0.33	0.24	1.71	0.0009	0.82
CO	1.4	1.04	7.36	0.0037	3.53
PM ₁₀	0.16	0.120	0.85	0.0004	0.41
SO ₂ *		0.001515 *lb SO ₂ /MMBTU	0.03	0.00002	0.02

PLANT CUMULATIVE INCREASE

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from the operation of S-1.

Table 2

Pollutant	Current Emissions (since April 5, 1991) (TPY)	Increase with this application (TPY)	Cumulative Emissions (Current + Increase) (TPY)
NO _x	0.000	0.016	0.016
POC	0.000	0.001	0.001
CO	0.000	0.004	0.004
PM ₁₀	0.000	0.000	0.000
SO ₂	0.000	0.000	0.000

TOXIC RISK SCREENING ANALYSIS

This application required a Toxics Risk Screen because the diesel particulate emissions are greater than the toxic trigger level.

Toxic Pollutant Emitted	Emission Rate (lb/yr)	Risk Screening Trigger (lb/yr)
PM ₁₀ (Diesel Particulate)	0.85	0.34

S-1 meets Best Available Control Technology for toxics (TBACT) since the diesel particulate emissions are less than 0.15 g/bhp-hr. For an engine that meets the TBACT requirement, it must also pass the toxic risk screening level of less than ten in a million. 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 passed the Health Risk Screening Analysis (HRSA) conducted on October 20, 2011 by the District's Toxic Evaluation Section. The source poses no significant toxic risk, since the increased cancer risk to the maximally exposed receptor (Residents) is 2.3 in a million with a hazard index of 0.0008. The increased cancer risk to workers is 0.97 in a million with a hazard index of 0.00069. The increased cancer risk to students is negligible since S-1 is not allowed to operate when the school is in session.

In accordance with the District's Regulation 2, Rule 5, this risk level is considered acceptable, as it has been determined that S-1 meets the current TBACT standards.

BACT

In accordance with Regulation 2, Rule 2, Section 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_x, CO, SO₂ or PM₁₀.

BACT is not required for S-1 since S-1 is not a new or modified source.

OFFSETS

Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NO_x per Regulation 2-2-302. Table 3 summarizes the increase in criteria pollutant emissions that will result from the operation of S-1.

Table 3

Pollutant	Current plant emissions (TPY)	Increase in plant emissions associated with this application (TPY)	Cumulative emissions (Current + Increase) (TPY)	Regulation 2-2-302 and 2-2-303 Offset Triggers (TPY)
NO _x	0.000	0.0162	0.0162	> 10; < 35
POC	0.000	0.0009	0.0009	> 10; < 35
CO	0.000	0.0037	0.0037	NA
PM ₁₀	0.000	0.0004	0.0004	> 1*
SO ₂	0.000	0.00002	0.00002	> 1*

*Applies to major facilities with a cumulative increase, minus contemporaneous emission reduction credits, in excess of 1 ton/year since April 5, 1991.

It can be seen from Table 3 above that S-1 does not trigger any offsets. Therefore, offsets are not warranted for any emission.

NSPS

The engine is not subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because S-1 was manufactured before April 1, 2006, as required by Section 60.4200(a)(2)(i) .

CARB STATIONARY DIESEL ENGINE ATCM

The State Office of Administrative Law approved the Airborne Toxic Control Measure (ATCM) on November 8, 2004. State law requires the local Air Districts to implement and enforce the requirements of the ATCM. Effective January 1, 2005, there is a prohibition on the operation of new diesel emergency standby engines greater than 50 bhp unless the following operating requirements and emission standards are met:

S-1 is not a new source as defined in ACTM Title 17 Code of California Regulations, section 93115.4(50)(A)(6), and S-1 comply with ATCM Section 93115.6(b)(3) which allows S-1 to operate up to 50 hrs/yr since S-1 emits less than 0.15 g/hhp-hr PM.

STATEMENT OF COMPLIANCE

Source S-1 is subject to and expected to be in compliance with the requirements of District Regulation 1-301 (*Public Nuisance*), Regulation 6-1-303 (*Ringelmann No. 2 Limitation*), Regulation 9-1 (*Sulfur Dioxide*) and Regulation 9-8 (*NO_x and CO from Stationary Internal Combustion Engines*). In order to ensure compliance with the requirements of these regulations, the facility will be conditionally permitted to meet the requirements.

From Regulation 1-301, no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. For purposes of this section, three or more violation notices validly issued in a 30 day period to a facility for public nuisance shall give rise to a rebuttable presumption that the violations resulted from negligent conduct.

S-1 is subject to the limitations of Regulation 6-1-303 (*Ringelmann No. 2 Limitation*). Regulation 6, Rule 1, Section 303 states that a person shall not emit for a period or periods aggregating more than three minutes in any hour, a visible emission that is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, nor shall said emission, as perceived by an opacity sensing device in good working order, where such device is required by District Regulations, be equal to or greater than 40% opacity. This low PM10 emitting engine is not expected to produce visible emissions or fallout in violation of this regulation, and it will be assumed to be in compliance with Regulation 6 pending a regular inspection

S-1 is also subject to the SO₂ limitations of Regulation 9-1-301 (*Limitation on Ground Level Concentrations of Sulfur Dioxide*), Regulation 9-1-302 (*General Emission Limitation*) and 9-1-304 (*Fuel Burning*). From Regulation 9-1-301, the ground level concentrations of SO₂ will not exceed 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. Per Regulation 9, Rule 1, Section 302, a person shall not emit from any source a gas stream containing sulfur dioxide in excess of 300 ppm (dry). And Regulation 9, Rule 1, Section 304, states that a person shall not burn any liquid fuel having sulfur content in excess of 0.5% by weight. Compliance with both Regulations 9-1-302 and 9-1-304 is likely since California law mandates using diesel fuel with a 0.015% by weight sulfur.

Regulation 9-8 "NOx and CO from Stationary Internal Combustion Engines." From Regulation 9-8-110.5, this source is not subject to the requirements of Regulations 9-8-301 (*Emission Limits on Fossil Derived Fuel Gas*), 9-8-302 (*Emission Limits on Waster Derived Fuel Gas*), 9-8-304 (*Emission Limits on Compression Ignited Engines*), 9-8-501 (*Initial Demonstration of Compliance*), 9-8-502 (*Record Keeping*), and 9-8-503 (*Quarterly Demonstration of Compliance*).

S-1 is exempt from Regulation 9-8-502 however; it is subject to the monitoring and record keeping procedures described in Regulation 9-8-530 (*Emergency Standby Engines, Monitoring and Recordkeeping*). The requirements of this Regulation are included in the permit conditions

This application is considered to be ministerial under the District's proposed CEQA guidelines, Regulation 2-1-311 (*Ministerial Projects*) and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.

This facility is within 1,000 feet from the nearest school and therefore is subject to the public notification requirements of Regulation 2-1-412.

A public notice will be prepared and mail to students and their parents and all business within 1000 ft of the following school(s):

St. Patrick – St. Vincent High School
1500 Benicia Road,
Vallejo, CA 94591

PSD is not triggered.

PERMIT CONDITIONS

COND# 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 (e)(2)(A)(3) or (e)(2)(B)(3)]
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

(e)(2)(A)(3) or (e)(2)(B)(3)]

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(e)(4)(G)(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 e)(4)(I), (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 (e)(2)(A)(1)] or (e)(2)(B)(2)]

RECOMMENDATION

Issue an Authority to Construct to **Nextel of California, Inc dba Sprint** for:

**S-1 Emergency Standby Diesel Generator Set
 John Deere, 3029TF270D, Model Year 2004
 64 BHP, 0.42MMBTU/hr**

Douglas Hall
Supervising Air Quality Engineer
Engineering Division