

# Engineering Evaluation Report

New Cingular Wireless PCS, LLC dba AT&T Mobility, P#22710  
21003 Broadway, Sonoma  
Application #26658

## Background

New Cingular Wireless PCS, LLC dba AT&T Mobility (“Applicant”) has applied for an Authority to Construct and Permit to Operate an emergency stand-by diesel generator set, to be located at 21003 Broadway in Sonoma. There are no other permitted operations located at this site. This engine will be operated under emergency conditions and otherwise for the purposes of maintenance and testing only.

## S-1, Emergency Standby Diesel Engine-Generator Set, Kukje Machinery, Model D3400T-Gen1, Model Year 2014, 85 bhp

The Applicant reported that the proposed location is within 1000 feet of a K-12 school.

## Emission Calculations

S-1 is an EPA-certified Tier 3 engine. The criteria pollutant emissions from the engine have been based on EPA-certified emission factors for all pollutants, except for SO<sub>2</sub>, which has been based on the maximum sulfur content allowed in California diesel fuel (0.0015% by weight). The emission factors have combined with the maximum allowable discretionary usage of 50 hours per year, allowed under District Regulation 9, Rule 8. The emissions at maximum capacity have been calculated on the attached spreadsheet and summarized in Table 1 below.

Table 1  
Criteria Pollutant Emissions, S-1

Pollutant	Emission Factor (g/hp-hr)	Annual Emissions (lbs/yr)	Annual Emissions (tpy)	Daily Emissions (lbs/day)
PM10	0.11	1.03	0.0005	0.5
NMHC+NO <sub>x</sub>	3.19			
POC*	0.16	1.49	0.0007	0.7
NO <sub>x</sub> *	3.03	13.63	0.0142	13.6
SO <sub>2</sub>		0.11	0.00001	0.01
CO	2.6	11.87	0.0124	11.9

\*The District considers the combined NMHC+NO<sub>x</sub> data to consist of 95% NO<sub>x</sub> and 5% NMHC/POC.

## Cumulative Increase

The District tracks increases in emissions from each facility. This is the first permitted operation proposed for this location so there are no pre-existing cumulative emissions for the facility. The emissions from S-1 based on 50 hours of discretionary operation will be entered as the project increase, as shown in Table 2.

Table 2  
P#22710, Cumulative Emission Increases Since 4/5/91

Pollutant	Existing, tpy	Project Increase, tpy	New, tpy
PM10	0	0.0005	0.0005
POC	0	0.0007	0.0007
NO <sub>x</sub>	0	0.0142	0.0142
SO <sub>2</sub>	0	0.00001	0.00001
CO	0	0.0124	0.0124

## Compliance Determination

### Regulation 1, "General Provisions and Definitions"

The facility is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. The proposed emergency diesel engine is a small certified engine which will be used for limited hours, for the purpose of testing and maintenance, other than during an actual emergency. The engine is not expected to be a source of public nuisance, as the allowed operation and emissions are low.

### Regulation 2, Rule 1, "Permits – General Requirements"

California Environmental Quality Act (CEQA): District Regulation 2, Rule 1, Section 310 specifies that all proposed new and modified sources subject to District permit requirements must be reviewed in accordance with CEQA requirements, except for ministerial projects or projects exempt from CEQA under Section 2-1-312. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Chapter 2.3.1 in the District's Permit Handbook, therefore this project is considered to be ministerial and therefore is not subject to CEQA review.

Public Notification: The public notification requirements of Regulation 2-1-412 apply to modifications which result in an increase in toxic air contaminant or hazardous air contaminant emission at facilities within 1,000 feet of the boundary of a K-12 school. The applicant has reported one school within that radius of the proposed project, The Presentation School, located 20872 Broadway. Therefore, the public notice requirements apply. The proposed location will be less than 500 feet from the nearby school so additional restrictions on hours of discretionary operation will apply.

### Regulation 2, Rule 2, "Permits – New Source Review"

Best Available Control Technology (BACT): Per Regulation 2, Rule 2, Section 301 BACT is required of new or modified sources with potential emissions of 10.0 pounds per day or more of POC, NPOC, NOX, PM10, or SO2. The maximum daily NOx and CO emissions from S-1 exceed 10.0 pounds per highest day, therefore BACT is triggered for these pollutants.

The BACT/TBACT standard for stationary emergency compression-ignition internal combustion engines > 50 hp is detailed in Document #96.1.3, dated 12/22/2010. There is no standard for BACT1, therefore BACT2 applies for these pollutants and is defined as the CARB ATCM standard at the applicable horsepower rating. The standard and the certified emissions are summarized in Table 3 below:

**Table 3**  
**BACT/TBACT for S-1**

Pollutant	BACT1	S-1 Emissions, g/hp-hr	BACT2, g/hp-hr
NMHC+NOx	No standard	3.19	3.5
CO	No standard	2.6	3.7

S-1 meets the BACT standards based on the manufacturer's certified emissions for NMHC+NOx and CO, therefore BACT has been met.

Emission Offsets: The POC and NOx emission offset requirements are specified in District Regulation 2, Rule 2, Section 302. POC and NOx emission offsets must be provided for new or modified sources located at a facility if the potential facility emissions exceed 10 tons per year of the pollutant. Since the potential facility emissions of POC and NOx are both less than 10 tons per year, neither POC nor NOx emission offsets are required.

The PM10 and SO2 emission offset requirements are specified in District Regulation 2, Rule 2, Section 303. PM10 and SO2 emission offsets must be provided for new or modified sources located at a major

facility that will result in a cumulative increase in excess of 1.0 ton per year since April 5, 1991. Since the potential facility emissions of these pollutants are less than 100 tons per year, this facility is not major for PM10 or SO2. Therefore, neither PM10 nor SO2 emission offsets are required.

Prevention of Significant Deterioration (PSD): The PSD requirements in District Regulation 2, Rule 2, Section 304 apply to new major facilities and major modifications at a major facility. This facility is not a major facility, therefore the PSD requirements do not apply.

**Regulation 2, Rule 5, “Permits – New Source Review of Toxic Air Contaminants”**

Health Risk Assessment: The District’s regulation concerning toxic air contaminant emissions is codified in Regulation 2, Rule 5, New Source Review of Toxic Air Contaminants (TAC). The TAC emissions from new and modified sources are subject to risk assessment review, if the emissions of any individual TAC exceed either the acute or chronic emission thresholds defined in Table 2-5-1.

The diesel PM emissions from the proposed engine are a TAC. The worst-case diesel PM emissions from S-1 were calculated based on the EPA-certified emissions for this engine, maximum capacity of 85 hp, and the maximum allowed discretionary operation of 50 hours per year. The resulting TAC emission estimates and risk screening trigger level have been summarized in Table 4a, below:

**Table 4a**  
**Estimated Worst-case TAC Emissions for S-1**

<b>Pollutant</b>	<b>Certified Emissions, g/hp-hr</b>	<b>Annual Emissions, lbs/yr</b>	<b>Chronic Trigger Level, lbs/yr</b>
<b>Diesel PM</b>	0.11	1.03	0.34

Since the estimated worst-case diesel PM emissions from the propose engine exceed the chronic risk screening trigger level in Table 2-5-1 of Regulation 2, Rule 5, a health risk analysis is required by Regulation 2, Rule 5.

Modeling: The ISCST3 air dispersion computer model was used to estimate annual average ambient air TAC concentrations resulting from operation of the proposed engine at receptor locations in the vicinity of the facility. Model runs were made with screening meteorological data. Elevated terrain was considered using 10m DEM input from the USGS Sonoma, Glen Ellen, Rutherford, and Kenwood sub areas. Rural dispersion coefficients were used in the model to best represent the land use in the vicinity of the source. Stack and building parameters were based on information provided by the Applicant.

Health Risk: The resulting ambient air concentrations from the modeling were combined with the cancer risk TAC potency value determined by the California Office of Environmental Health Hazard Assessment and standard risk assessment methodology. Estimates of residential risk assume exposure to annual average TAC 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. Cancer risk adjustment factors (CRAFs) were used to calculate all cancer risk estimates. The CRAFs are age-specific weighting factors used in calculating cancer risks for exposure of infants, children, and adolescents to reflect their anticipated special sensitivity to carcinogens. This risk assessment methodology is considered to be health-protective.

The potential for non-cancer health effects was evaluated by comparing the long-term exposure level to a Reference Exposure Level (REL). A REL is a concentration level at or below which no adverse health effects are anticipated. RELs are designed to protect sensitive individuals within the population. Comparisons to RELs are made by determining the hazard index, which is the ratio of the estimated exposure level to the REL.

The estimated health risks from the operation of S-1 are summarized in Table 4b, below. Since the engine is prohibited from operating between the hours of 7:30 and 3:30pm on days when school is in session, the increased risk to student receptors is expected to be negligible.

**Table 4b**  
**Health Risk Analysis Results, S-1**

<b>Receptor</b>	<b>Maximum Cancer Risk</b>	<b>Maximum Non-Cancer Hazard Quotient</b>
Resident	1.0 chances in a million	0.0004
Worker	4.1 chances in a million	0.0029

Results from the health risk analysis indicated a maximum increase in cancer risk estimated at 4.1 in a million for the nearest resident and a maximum non-cancer hazard quotient of 0.0029.

Pursuant to Regulation 2, Rule 5, Section 301, TBACT must be applied to any new or modified source of TACs where the source cancer risk is greater than 1 in a million. As discussed under the BACT analysis, BACT/TBACT for the proposed emergency diesel engine is defined as compliance with the state regulation. The state standard for PM is 0.15 g/hp-hr. This engine is a certified engine with diesel PM emissions of 0.11 g/hp-hr and therefore meets BACT/TBACT. Since the engine meets TBACT, the project risk does not exceed 10 in a million, and the hazard quotient does not exceed 1.0, the project risk and hazard quotient are approvable pursuant to Regulation 2, Rule 5, Section 302.

**Regulation 2, Rule 6, “Permits - Major Facility Review”**  
**40 CFR Part 70, State Operating Permit Programs (Title V)**

The federal operating permit program requirements in 40 CFR Part 60 have been codified in District Regulation 2, Rule 6. As this facility is not a major facility, not a phase II acid rain facility, not a subject solid waste incinerator, and not a designated facility, this facility is not required to obtain a Title V Federal Operating Permit.

**Regulation 3, “Fees”**

Regulation 3 specifies the application and Permit to Operate fees. The Applicant has paid the applicable fees, including the first year of Permit to Operate fees, which were billed under Invoice 3LN10.

**Regulation 6, Rule 1, “Particulate Matter – General Requirements”**

All sources are subject to the particulate emission and opacity standards in Regulation 6, Rule 1. Section 6-1-303 specifies that visible emissions may not be as dark or darker than No. 2 on the Ringelmann Chart, for more than 3 minutes in any hour. Section 6-1-305 prohibits emissions of visible particles from causing a public nuisance. Compliance with the opacity limitation and the public nuisance prohibition is expected based on the EPA-certified diesel PM emissions for this engine.

Section 6-1-310 limits particulate emissions to 0.15 grains per dry standard cubic foot of exhaust gas volume and applies to the portable engine. If it is assumed that the diesel engine exhaust gases contain 15% excess oxygen under normal operating conditions, this limit can be compared to the EPA-certified PM emission factor as follows.

From 40 CFR Part 60, Appendix A, Method 19, Table 19-1, a stoichiometric dry gas combustion factor of 9,190 dscf/MMBtu is given for distillate oil combustion. At 15% excess oxygen, this factor becomes:

$$(9,190 \text{ dscf/MMBtu}) * (21\% / (21\% - 15\%)) = 32,165 \text{ dscf combustion products/MMBtu.}$$

The conversion of the Section 6-1-310 standard of 0.15 gr/dscf at 15% oxygen to lb/MMBtu is:

$$(32,165 \text{ dscf/MMBtu}) * (0.15 \text{ gr/dscf}) * (\text{lb}/7000 \text{ gr}) = 0.689 \text{ lb/MMBtu}$$

Based on the fuel consumption rate for S-1, 0.6 MMBtu per hour, the certified PM emission rate from this engine in terms of fuel consumption is 0.034 pound per MMBtu. Since this PM emission rate is well below the converted Section 6-1-310 emission rate of 0.689 pound per MMBtu, compliance with Section 6-1-310 is assumed.

Section 6-1-401 requires the operator to have the means to know the appearance of emissions from the operations at all times. The emissions from the emergency engine during discretionary use will occur during active, manned operation of the source, so the emissions will be visible to the operator at all times, in compliance with this section.

**Regulation 9, Rule 1, “Inorganic Gaseous Pollutants – Sulfur Dioxide”**

Regulation 9, Rule 1 limits emissions of SO<sub>2</sub> and applies to the proposed emergency diesel engine. Section 9-1-304 limits the sulfur content of liquid fuel to 0.5% by weight. This standard will be met since California diesel fuel is limited to 0.0015% by weight. This low sulfur content is also expected to ensure compliance with the ground level concentration limit in Section 9-1-301.

**Regulation 9, Rule 8, “Inorganic Gaseous Pollutants – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines”**

Regulation 9, Rule 8 applies to stationary internal combustion engines with a rated output greater than 50 bhp. Section 9-8-110.5 exempts emergency standby engines from Section 301 through 305, 501, and 503 of this rule. Since S-1 will be used as an emergency standby engine, the limitation to 50 hours of reliability-related operation in any calendar year will apply, as specified by Section 9-8-330. Operation during emergencies is not limited. In addition, the monitoring and recordkeeping requirements in Section 9-8-530 apply and will be included in the permit conditions for this source.

**CA Code of Regulations, Title 17, Section 93115, Airborne Toxic Control Measure for Diesel Particulate Matter from Stationary Engines Rated at 50 Horsepower and Greater**

The proposed emergency diesel engine S-1 is subject to the California Air Resources Board Air Toxic Control Measure (ATCM) for stationary diesel engines since it is a diesel-fueled engine with a rating greater than 50 brake horsepower.

Section 93115.5 requires use of CARB diesel fuel or one of the other approved alternative diesel fuels. The Applicant has indicated only CARB diesel fuel will be used at S-1.

Since S-1 is proposed to be located less than 500 feet from the nearest school grounds, Section 93115.6(a)(1) prohibits operation of S-1 between 7:30 am and 3:30 pm on days when school is in session. The Applicant has been informed of this restriction and has agreed to comply. The limitation will also be included in the permit conditions for S-1.

Section 93115.6(a)(3)(A) specifies the PM, NMHC+NO<sub>x</sub>, and CO emission limits that apply to S-1 based on the power rating of the engine. This section requires the engine to be certified to meet the new nonroad compression-ignition standards in 40 CFR Part 60, Subpart IIII (discussed in more detail below), and limits use to not more than 50 hours per year for maintenance and testing. S-1 is an EPA-certified engine, meeting these emission standards as summarized in Table 5 below:

**Table 5  
 CARB Stationary Engine ATCM Limits**

	<b>Model Year</b>	<b>PM, g/hp-hr</b>	<b>NMHC+NOx, g/hp-hr</b>	<b>CO, g/hp-hr</b>
<b>Standard, Engines <math>\geq</math> 75 hp and <math>&lt;</math> 100 hp</b>	2008+	0.15	3.5	3.7
<b>S-1 Certified Emissions</b>	2014	0.11	3.19	2.64

Section 93115.10(d)(1) and (f) require installation of a non-resettable hour-meter and recording hours of operation, the reason for the operation, and fuel used. These requirements will be specified by permit condition.

**40 CFR Part 60, Standards of Performance for New Stationary Sources**

Subpart IIII, Stationary Compression Ignition Internal Combustion Engines: Subpart IIII contains standards for stationary compression ignition internal combustion engines. This regulation applies to manufacturers, owners, and operators of stationary internal combustion engines, meeting certain size and model year requirements. Section 60.4205 applies to 2007 model year and later emergency stationary compression-ignition engines with displacement of less than 30 liters per cylinder, which are not fire pump engines. S-1 is a stationary compression-ignition model year 2014 engine with displacement of 0.85 liters per cylinder and is subject to this regulation.

Section 60.4205 specifies emission standards for emergency engines. Section 60.4205(b) requires model year 2007 and later engines to comply with the emission standards for new nonroad compression-ignition engines in Section 60.4202 for the same model year and maximum power rating. Section 60.4202(a)(2) requires model year 2007 and later emergency engines with maximum power of 50 hp or greater to meet the emission standards for new nonroad compression-ignition engines in 40 CFR 89.112 and 113 for all pollutants. These are the same standards as contained in the state ATCM, summarized in Table 5 above, and S-1 is certified to meet these emission standards.

Section 60.4207 requires use of diesel fuel that meets the requirements of 40 CFR Part 80.510(b). California diesel fuel meets the requirements of this regulation. Section 60.4211(f) limits operation in non-emergency situations to 50 hours per year and allows unlimited use for emergency operation. Operation in excess of 50 hours per year for the purposes otherwise specified in Section 60.4211(f) is not allowed by District Regulation 9, Rule 8. The Applicant is expected to comply with these fuel and operational restrictions, which are included in the permit conditions.

**40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPs)**

There are no subparts under 40 CFR Part 61 that apply to internal combustion engines.

**40 CFR Part 63, Emission Standards for Hazardous Air Pollutants for Source Categories**

Subpart ZZZZ, Stationary Reciprocating Internal Combustion Engines: Subpart ZZZZ contains the standards for stationary reciprocating internal combustion engines located at major and area sources of HAP emissions. Since S-1 is a stationary engine, this regulation applies. Section 63.6590(c)(1) specifies that a new stationary reciprocating, compression-ignition internal combustion engine located at an area source must meet the requirements of this regulation by meeting the requirements of 40 CFR Part 60, Subpart IIII. No other requirements under this regulation apply. S-1 meets the requirements of 40 CFR Part 60, Subpart IIII, as discussed above.

**Permit Condition #22850**

The following standard conditions are proposed to be included on the source permit to enforce District, state, and federal applicable requirements.

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**

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 an Authority to Construct for the following source:

**S-1, Emergency Standby Diesel Engine-Generator Set, Kukje Machinery, Model D3400T-Gen1,  
Model Year 2014, 85 bhp**

\_\_\_\_\_  
Tamiko Endow  
Air Quality Engineer

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Date