

ENGINEERING EVALUATION

Facility ID No. 10
Chevron Products Company
841 Chevron Way, Richmond, CA 94801
Application No. 724892

BACKGROUND

Chevron Products Company (Chevron), has applied for an Authority to Construct (AC)/Permit to Operate (PO) for the following equipment:

S-9329 Emergency Backup Direct-Drive Firewater Pump
Firewater Pump Make/Model: Clarke C13H0-UFAD78
Tier 3 diesel engine with no integrated or add-on control
Diesel Engine Make: Caterpillar, Model: C13, EPA Family Name: RCPXL12.5NYS
Model Year: 2024, 455 BHP, 344 Kw, 3.199 MMBtu/hour
Location: Richmond Long Wharf, Berth 5

Chevron is undergoing replacements and upgrades of its firewater line protecting the Richmond Long Wharf (RLW). S-9329 meets the United States Environmental Protection Agency (USEPA) Tier 3 Off-road standard. The engine will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

EMISSIONS

Emissions for Oxides of Nitrogen (NOx), Precursor Organic Compounds (POCs), carbon monoxide (CO), particulate matter with an aerodynamic diameter of 10 microns (PM10), particulate matter with an aerodynamic diameter of 2.5 microns (PM2.5), and oxides of Sulfur (SO2) are calculated in Table 1 below.

Table 1: Annual and Daily Emissions for S-9329 from EPA Certified Data

Pollutant	Emission Factor ⁽¹⁾	Max Daily Emissions	Annual Emissions	Annual Emissions
	(g/bhp-hour)	(pounds/day)	(pounds/year)	(tons/year)
NOx	2.68	64.6	134.52	0.067
POC	0.15	3.6	7.47	0.004
CO	2.01	48.4	100.89	0.050
PM ₁₀	0.12	2.9	5.98	0.003
PM _{2.5}	N/A ⁽³⁾	2.9	5.98	0.003
SO ₂	N/A ⁽⁴⁾	0.12	0.25	0.000

Basis:

- Annual emissions: Reliability-related activity 50 hours for S-9329
- Maximum daily emissions: 24-hour operation
- ¹Emission factors provided by EPA certified data for engine family RCPXL12.5NYS
- ³PM_{2.5} = PM₁₀
- ⁴SO₂ emission factor calculated based on the following:
 - Complete conversion of sulfur in fuel to SO₂ and a maximum sulfur content of 15 ppm.
 - Density of Ultra Low Sulfur Diesel Fuel = 7.31 lb/gal

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- Fuel Consumption Rate =23.1 gal/hr
- MW(SO₂)=64.066 g/mole, MW(S)=32.065 g/mole
- $E_{SO_2} = \left(\frac{15 \text{ lb S}}{10E+06 \text{ lb fuel}}\right) \left(7.31 \frac{\text{lb fuel}}{\text{gal fuel}}\right) \left(23.1 \frac{\text{gal fuel}}{\text{hr}}\right) \left(\frac{64.066 \text{ g/mol}}{32.065 \text{ g/mol}}\right) \left(50 \frac{\text{hr}}{\text{yr}}\right)$
 $E_{SO_2} = 0.12 \text{ lb/day} = 0.25 \text{ lb/yr} = 0.000 \text{ ton/yr}$

CUMULATIVE INCREASE

Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result from this application assuming S-9329 will operate for 50 hours/year for reliability related testing.

Table 2: Cumulative Emissions Increase, Post 4/5/91

Pollutant	Pre-application Cumulative Emissions Post 4/5/91 (tons/year)	Un-offset cumulative increase (tons/year)	S-9329 Emissions (tons/year)	Post-application Cumulative Emissions (tons/year)
NOx	1384.263	0.002	0.067	1384.330
POC	292.912	1.649	0.004	292.916
CO	498.203	77.659	0.050	498.253
PM ₁₀	129.975	0.543	0.003	129.978
PM _{2.5}	0.052	0.052	0.003	0.055
SO ₂	2098.858	0.595	0.000	2098.858

HEALTH RISK ASSESSMENT (HRA)

The diesel exhaust particulate matter emissions from S-9329, estimated at 5.98 pounds/year assuming the engine operates for 50 hours/year, is greater than the Regulation 2, Rule 5 chronic toxic trigger level of 0.26 pounds/year.

This application qualifies for HRA streamlining using the Air District’s 2022 HRA Streamlining spreadsheet for diesel-fired IC engines. The HRA will be conducted in conformance with the Air District’s risk assessment guidelines, and those guidelines provide for a streamlined approach for determining that the project complies with Air District Regulation 2-5 risk limits for certain types of backup diesel generators.

Regulation 2-5-216 requires the project include those new or modified sources of TACs at a facility that have been permitted within the five-year period immediately preceding the date a complete application is received, and any project at that facility where an Authority to Construct has been issued and has not expired, unless the applicant demonstrates to the satisfaction of the APCO that construction or modification of the sources included in the current application was neither (1) a reasonable foreseeable consequence of the previous project, nor (2) a critical element or integral part of the previous project.

This application is not related to any other applications issued in the past 5 years to be considered part of a project.

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BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Per Regulation 2-2-301, an Authority to Construct and/or Permit to Operate for a new source shall require BACT to control emissions of an Air District BACT pollutant as defined in Regulation 2-2-210 if the source will have the potential to emit that pollutant in an amount of 10.0 or more pounds on any day, as defined in Regulation 2-2-301.1. Per Table 1 of this evaluation report, S-9329 triggers BACT for NOx and CO.

Per Regulation 2-2-202, BACT is defined as an emission limitation, control device, or control technique applied at a source that is the most stringent of:

- the most effective device or technique successfully utilized,
- the most stringent emission limitation achieved by an emission control device or technique applicable for the source category
- the most effective emission control limitation for the source category that is contained in an approved State Implementation Plan, or
- the most effective control device or technique or most stringent emission limitation that is technologically feasible, taking into consideration cost-effectiveness, any ancillary health and environmental impacts, and energy requirements.

These requirements are generally categorized as either technologically feasible and cost-effective (BACT 1) or achieved-in-practice (BACT 2)

Because achieved-in-practice is required regardless of cost and BACT 1 is more stringent than BACT 2, an evaluation for what has been achieved-in-practice is conducted first.

Achieved-in-Practice

For NOx and CO, achieved-in-practice BACT has been determined to be meeting the CARB Air Toxics Control Measure (ATCM) standard for the respective pollutant at the applicable horsepower rating.

Technologically Feasible and Cost-Effective

The following control technologies and mitigation measures have been found to be technologically feasible for abating NOx emissions from internal combustion engines¹:

- Engine Ignition Timing Retard (achievable NOx reduction 20 to 30 percent), and
- Selective Catalytic Reduction (achievable NOx reduction of 90 percent)

Techniques for mitigating CO emissions include:

- Catalytic oxidation, and
- Good combustion practices (e.g., preventative maintenance, change oil and filter every 500 hours of operation, inspect all hoses and belts every 500 hours of operation, minimize idling time).

¹ United States Environmental Protection Agency. Control Techniques Guidelines for Alternative Control Techniques Document – NOX Emissions from Stationary Reciprocating Internal Combustion Engines. EPA-453/R-93-032. July 1993. Updated September 2000.

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Although Regulation 2-2 does not include a definition for cost-effectiveness, Regulation 2-2-414 requires the Air District to publish and periodically update a BACT Workbook and that BACT will be determined using the workbook as a guidance document.

Section 1 of the BACT Workbook includes a maximum cost guideline for NOx emissions of \$17,500 per ton of emissions reduced. The BACT Workbook does not have a maximum cost effectiveness value for CO. However, the South Coast Air Quality Management District lists a maximum cost-effectiveness value of \$801 for CO.

Using the maximum cost-effectiveness value of \$ 17,500 and assuming that 90 percent of the NOx emissions in Table 1 could be abated, the maximum annualized cost for NOx controls must not exceed \$1,055² to be deemed cost-effective. Likewise, using the maximum cost-effectiveness value of \$801 and assuming that 90 percent of the CO emissions in Table 1 could be abated, the maximum annualized cost for CO controls must not exceed \$36³ to be deemed cost-effective.

All NOx and CO controls are expected to exceed both maximum annualized costs. Therefore, requiring more stringent controls than achieved-in-practice requirements is deemed not cost-effective. Though this application was received by the Air District on/after December 2, 2024, the Air District will not subject direct drive firewater pumps (such as S-9329) to the BACT guideline Document # 96.1.3 (Rev. 9) dated 12/2/24 because it applies to non-direct drive fire pump engines. The Air District conducted an analysis to determine what may be considered Achieved-In-Practice BACT for S-9329 and determined it to be compliance with Tier 3 standards at this time.

For reasons stated above, S-9329 will be required to comply with the Tier 3 standards shown below:

Table 3: BACT Compliance Check

Pollutant	Emission Factor	BACT Standard
	g/bhp-hour	g/bhp-hour
¹ NMHC + NOx	2.68	3.0
CO	2.01	2.6

¹NMHC [0.15] + NOx [2.68] = 2.83 g/bhp-hour

² \$ 1,055 = 17,500 x (0.067 x 0.90)

³ \$ 36 = 801 x (0.050 x 0.90)

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OFFSETS

The policy titled “Calculating Potential to Emit for Emergency Backup Power Generators” dated and effective June 3, 2019, doesn’t apply to S-9329 because the assumptions about potential emergency usage are different for emergency engines used to fight fires when compared to emergency engines used to provide backup power. Per 2-2-302.2.2, Chevron will have to offset the NOx and POC emissions increase from S-9329 and the un-offset cumulative increase of 0.069 TPY (0.002 + 0.067) for NOx and 1.653 TPY (1.649 + 0.004) for POC shown in Table 2 at a 1.15:1 ratio. The NOx and POC offsets of 0.079 TPY (0.069 x 1.15) and 1.901 TPY (1.653 x 1.15), respectively will be withdrawn from banking certificate # 1760 which contains 18.587 TPY of NOx and 21.237 TPY of POC.

Chevron’s potential to emit SO2, PM2.5, and PM10 per emissions summarized in Table 2 exceeds 100 tons per year per pollutant without accounting for grandfathered sources, exempt equipment emissions, and registered source emissions. Per 2-2-303.1, if the un-offset cumulative increase in emissions of SO2, PM2.5, and/or PM10 and any related sources since the baseline date determined in accordance with 2-2-608 exceeds 1 ton per year per pollutant, Chevron would have to provide offsets for each of the above pollutants at a 1:1 ratio for the un-offset cumulative increase since the baseline date. Offsets for SO2, PM2.5, and PM10 are not required for this application because there will be no increase in the cumulative increase for SO2 and the un-offset cumulative increase for each of the above pollutants (0.595 TPY for SO2, 0.543 TPY for PM10 and 0.052 TPY for PM2.5) is below 1 TPY as summarized in Table 4.

Table 4:

Scenario	PM10 (tpy)	PM2.5 (tpy)	SO2 (tpy)
Pre-A# 724892 un-offset emissions	0.543	0.052	0.595
A# 30415 (9 portable prime DICE)	0.111	0.111	0.190
A# 724892 (FWP)	0.003	0.003	0.000
Total	0.657	0.166	0.785

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STATEMENT OF COMPLIANCE

The owner/operator is expected to comply with all applicable requirements. Key requirements are listed below:

Airborne Toxic Control Measure for Stationary Compression Ignition Engines

The Air District is charged with enforcing the requirements of California's Air Toxic Control Measure for Stationary Compression Ignition Engines in Title 17, California Code of Regulations, Sections 93115 et seq. (ATCM) Subsection 93115.6(a)(4)(A)(1)(a) requires S-9329 to meet the emissions standards specified in Table 2 of the ATCM.

The emission standards found in Table 2 of the ATCM that apply to S-9329 are:
NMHC + NO_x = 4.0 gram/kW-hour (3.0 gram/bhp-hour);
CO = 3.5 gram/kW-hour (2.6 gram/bhp-hour); and
PM = 0.20 gram/kW-hour (0.15 gram/bhp-hour).

As shown in Table 1 of this evaluation report, S-9329's emission rates comply with the requirements in Table 2 of the ATCM.

Subsection 93115.6(a)(4)(A)(1)(b) requires S-9329 be certified to the emission standards as specified in 40 CFR § 60.4202(d) (*40 CFR, Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.*) The NSPS IIII standards are similar to the emission standards in Table 2 of the ATCM discussed above. Therefore, S-9329 complies with NSPS IIII.

Subsection 93115.6(a)(4)(A)(1)(c) limits the non-emergency operation of fire pump engines to no more than the number of hours necessary to comply with the testing requirements of the National Fire Protection Association (NFPA) 25. Permit condition 100072 will limit the non-emergency operation of S-9329 to 50 hours/year for maintenance and testing and hence will comply with this subsection.

Regulation 6-1 (Particulate Matter – General Requirements)

S-9329 is subject to Regulation 6, Rule 1. Opacity and visible emissions from S-9329 are limited by Regulations 6-1-303.1 (internal combustion engines of less than 25 liters (1500 in³) displacement). S-9329 has a displacement of 12.5 liters (763 in³).

S-9329 will comply with 0.15 gr/dscf in Section 6-1-310.1, as shown below:

PM₁₀ emission rate = 0.12 pounds/hr (0.12 x 455 ÷ 454);
Exhaust flowrate = 903 dscfm (2,830 acfm @ 952F, 15% moisture)
Outlet grain loading rate = 0.015 gr/dscf (0.12 x 7,000 ÷ 903 x 60)

Regulation 6-1-305 prohibits emission of particles from any operation in sufficient number to cause annoyance to any other person where the particles are large enough to be visible as individual particles at the emission point, or of such size and nature as to be visible individually as incandescent particles. S-9329 is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6-1-305.

S-9329's compliance with Regulation 6, Rule 1 will be confirmed by the Air District's Compliance & Enforcement staff during their routine inspections.

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Regulation 9-1-301 (Limitations on Ground Level Concentrations)

S-9329 is subject to and is expected to comply with the applicable SO₂ limitations in Regulation 9, Rule 1 ("Inorganic Gaseous Pollutants – Sulfur Dioxide"). Because SO₂ emissions from S-9329 are negligible, Chevron will not be required to conduct ground level monitoring because of this project.

Regulation 9-8 (Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines)

S-9329 will be operated as an emergency standby engine and therefore is not subject to the emission rate limits in Regulation 9, Rule 8 ("Inorganic Gaseous Pollutants – NO_x and CO from Stationary Internal Combustion Engines"). S-9329 is exempt from the requirements of Sections 9-8-301 through 305, 501, and 503 per Reg. 9-8-110.5 (Emergency Standby Engines). S-9329 is subject to and is expected to comply with 9-8-330.3 (Emergency Standby Engines, Hours of Operation) since non-emergency hours of operation will be limited in the permit conditions to 50 hours per year. S-9329 is also subject to and is expected to comply with monitoring and record keeping requirements of Regulations 9-8-502.1 and 9-8-530, which are incorporated into the proposed permit conditions.

California Environmental Quality Act (CEQA)

This project includes one emergency standby diesel firewater pump that may operate during testing and maintenance and without restrictions during emergency-use events. It may be employed to prevent or reduce damage to life, health, and property at an existing facility.

The 2023 California Environmental Quality Act (CEQA) Statutes and Guidelines lists classes of projects in Section 15300, which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA.

Section 15301 lists Class 1 projects that involve negligible or no expansion of use. This includes additions to existing structures provided that the addition will not result in an increase of more than 50 percent of the floor area of the structures before the addition, or 2,500 square feet, whichever is less, as listed in Section 15301(e)(1). The proposed project will be located within Chevron which is approximately 2,900-acres (over 126 million square feet) and occupies most of the Point San Pablo Peninsula, with east and south boundaries in the vicinities of the residential communities of North Richmond and Point Richmond, respectively. The floor area in this situation are the structures at the refinery which would easily be in the hundreds of thousands to perhaps even millions of square feet. 50% of this would be floor area would be significantly over the area occupied by S-9329 even if the proposed enclosure for the firewater pump is assumed to be 50 feet long and 50 feet wide for a total area of 2,500 square feet. Since S-9329's footprint will not exceed 50 percent of the floor area of the existing refinery structures, or 2,500 square feet, this project is categorically exempt from the provisions of CEQA per Regulation 2-1-312.6 and no further CEQA analysis is required.

Additionally, the applicant has completed Form Appendix H (Environmental Information Form) in accordance with Regulation 2-1-426 and it has been reviewed by the Air District, as required for categorical CEQA exemptions. In making the determination that this application is categorically exempt: 1) the Air District reviewed the CEQA-related information from the applicant indicating that there is no potential for a significant adverse environmental impact from the project; 2) a refined health risk assessment (HRA) though needed was not required because the application qualified for HRA streamlining was approved by the Air District; and 3) the Air District determined there are no unusual circumstances, or that the cumulative impacts from successive projects of the same type in the same place do not result in significant adverse environmental impacts.

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A CEQA Notice of Exemption will be filed with the Contra Costa County if the Air District issues an Authority to Construct/Permit to Operate, which will be determined after considering public comments.

New Source Performance Standards (NSPS)

Any new or modified source is required to comply with *Regulation 10, Standard of Performance for New Stationary Sources* – which is Title 40, Part 60 of the Code of Federal Regulation incorporated by reference. According to 40 CFR Section 60.4200(a)(2)(ii) certified National Fire Protection Association (NFPA) fire pump engines manufactured after July 1, 2006 are subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. S-9329 is a NFPA fire pump engine and subject to NSPS IIII.

S-9329 is a model year 2009+ engine and is rated at 510 bhp. Section 60.4205(c) requires that owners and operators to comply with the emission standards in Table 4 “Emission Standards for Stationary Fire Pump Engines” of the Subpart that are listed below: g/bhp-hour

NMHC+NO_x = 3.0 g/bhp-hour; PM = 0.15 g/bhp-hour

It can be seen from Table 1 in this evaluation report that S-9329 complies with the emission standards in Table 4 of NSPS IIII.

National Emissions Standards for Hazardous Air Pollutants (NESHAP)

S-9329 is subject to 40 CFR 63, Subpart ZZZZ (MACT ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines because the engine will be constructed (~installed) on/after June 12, 2006. Per §63.6590(c)(1), “new” sources such as S-9329 are required to meet the requirements in MACT ZZZZ by meeting the requirements in NSPS IIII. As previously discussed, S-9329 complies with NSPS IIII and therefore, will comply with MACT ZZZZ as well.

Prevention of Significant Deterioration (PSD)

2-2-204 defines a PSD project as one at a major PSD facility *and* there is a significant increase in emissions of a PSD pollutant *and* there is a significant net increase in emissions of a PSD pollutant. The emissions increase of PSD pollutants defined in 2-2-233 from S-9329 summarized in Table 1 of this evaluation report are below the significant thresholds in 2-2-227. Therefore, PSD does not apply to this application.

School Notification (Regulation 2-1-412)

S-9329 is not located within 1,000 feet of the outer boundary of a K-12 school site. Therefore, S-9329 is not subject to the School public notification requirements of Regulation 2-1-412.

Overburdened Community (Regulation 2-1-243)

Chevron is located within an Overburdened Community (OBC). Therefore S-9329 is subject to the OBC public notification requirements of Regulation 2-1-412 because an HRA was required.

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PERMIT CONDITIONS

Permit Condition #100072 for S-9329

1. The owner or 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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
2. 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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
3. 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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]
4. 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 or 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: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

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Permit condition # 100528 S-9329

1. The owner/operator shall fire each engine exclusively with CARB diesel fuel having a sulfur content no more than 15 parts per million by weight.

[Basis: Cumulative Increase, § 93115.4]

Permit Condition# 100073 S-9329

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related activities.

[Basis: Cumulative Increase; Regulation 2-5; Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

End of Conditions

RECOMMENDATION

The Air District has evaluated the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable Air District, state, and federal air quality-related regulations, including the health risks resulting from toxic air contaminant emissions. The preliminary recommendation is to issue a permit for this project. After considering all comments received, the Air District will make a final determination.

I recommend that the Air District initiate the public comment period and consider any comments received prior to taking any final action on the following source:

S-9329 Emergency Backup Direct-Drive Firewater Pump
Firewater Pump Make/Model: Clarke C13H0-UFAD78
Tier 3 diesel engine with no integrated or add-on control
Diesel Engine Make: Caterpillar, Model: C13, EPA Family Name: RCPXL12.5NYS
Model Year: 2024, 455 BHP, 344 Kw, 3.199 MMBtu/hour
Location: Richmond Long Wharf, Berth 5

Chris Thompson
Senior AQ Engineer

Date: _____