

ENGINEERING EVALUATION

Koch Carbon, LLC
700 E 3rd Street, Pittsburg, CA 94565
Facility ID #: 10684
Application #: 700134

I. BACKGROUND

Koch Carbon, LLC (Koch) is applying for an Authority to Construct/ Permit to Operate for the following equipment:

S-37 Portable Street Sweeper Auxiliary Diesel Engine
Make: Kubota Corporation, Model: V2403-CR-TE4B, 52.3 bhp

The engine is an auxiliary engine on a street sweeper. Criteria pollutants of concern from the engine are nitrogen oxides (NO_x), carbon monoxide (CO), nonmethane hydrocarbons (NMHC)/precursor organic compounds (POC), sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter of less than 10 microns (PM₁₀), and particulate matter with an aerodynamic diameter of less than 2.5 microns (PM_{2.5}). The toxic air contaminant (TAC) of concern from the engine is diesel particulate matter (DPM).

S-37 meets the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 4 Final emission standards. The engine will burn commercially available California low sulfur diesel fuel, and the diesel fuel's sulfur content will not exceed the California limit of 0.0015% sulfur by weight.

Koch operates an existing, permitted portable street sweeper auxiliary engine (S-4) that is limited to 3,650 hours per year of operation per Permit Condition 27303. In their application submittal, Koch originally requested a combined operating limit of 3,650 hours per year for both S-4 and S-37 so that the proposed engine (S-37) could operate within existing NO_x offsets. According to the "Complex Permitting Handbook for BAAQMD New Source Review Permitting", this type of bubble limit would not constrain the maximum emissions from any individual source. Each source's potential to emit (PTE) would still be their full maximum emission rate at the maximum operating capacity (3,650 hours), and additional NO_x offsets would still be required. After further conversations with Koch, Koch decided to permit S-37 independently of S-4 at 3,650 hours per year.

Portable engines are non-road engines as defined by 40 CFR 1039.801 and 1068.30. Section 209(e) of the Federal Clean Air Act and 40 CFR Part 1074, Subpart A, Section 1074.10 do not allow states "or political subdivisions" to impose emission control on non-road engines. The exception is standards and other requirements imposed by the State of California necessary to achieve attainment of air pollution standards. The regulatory analysis for this application will take this into account.

This evaluation discusses the proposed source's compliance with all applicable rules and regulations.

II. EMISSIONS SUMMARY

Table 1 summarizes criteria pollutant emissions from S-37.

Table 1: S-37 Annual and Daily Emissions from EPA/CARB Certified Data

Pollutant ¹	Emission Factor (g/bhp-hr) ^{2,3}	Emissions ^{4,5}		
		Max Daily (lb/day)	Annual (lb/year)	Annual (ton/year)
NO _x	2.37	6.6	998	0.499
NMHC (POC)	0.01	0.0	6	0.003
CO	0.03	0.1	13	0.006
PM ₁₀ /PM _{2.5} ¹	2.2E-03	0.0	1	0.000
SO ₂	5.5E-03	0.0	2	0.001

Notes:

- PM_{2.5} emissions are conservatively assumed to be equal to PM₁₀ emissions.
- NO_x and NMHC (POC) emission factors are based on EPA certified data for EPA Engine Family NKBXL02.4EKD. CO and PM₁₀/PM_{2.5} emission factors are based on CARB Executive Order U-R-025-1006 for EPA Engine Family NKBXL02.4EKD.
- The SO₂ emission factor (EF) is derived using the follow equation from AP-42 Chapter 3.4 Table 3.4-1¹, which is based on the full conversion of fuel sulfur to SO₂ and a sulfur content (S) of 0.0015 wt%:

$$SO_{2EF} = 0.00809 \times S = 0.00809 \times 0.0015 = 1.2E - 05 \frac{lb}{bhp - hr} \times 453.592 \frac{g}{lb} = 5.5E - 03 \frac{g}{bhp - hr}$$

- Maximum daily emissions are based on 24 daily operating hours.
- Maximum annual emissions are based on 3,650 annual operating hours.

III. 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 10.0 pounds or more per highest day of POC, NPOC, NO_x, CO, SO₂, PM₁₀, or PM_{2.5}.

As shown in **Table 1**, estimated maximum daily emissions are not expected to exceed 10.0 pounds per highest day for any pollutant. The portable engine in this application is defined as a non-road engine, and non-road engines are not subject to BACT.

IV. HEALTH RISK ASSESSMENT (HRA)

Pursuant to Regulation 2-5-110, a project shall not be subject to this rule if, for each TAC, the total project emissions are below the acute and chronic trigger levels listed in Table 2-5-1 of this regulation. A project includes all new or modified sources of TACs from related applications permitted within the last five years. One other application was submitted within the last five years and is considered a part of this project – Application #30492. **Table 2** provides a summary of project DPM emissions.

¹ "AP-42 Vol. I, 3.4: Large Stationary Diesel and All Stationary Dual-fuel Engines". EPA. October 1996.

Table 2: Project DPM Emission Summary

Application #	Source #	Annual DPM Emissions (lb/year)	DPM Chronic Trigger Level (lb/year)	Exceeds Chronic Trigger?
700134	S-37	0.94	0.26	Yes
30492	S-4	0.42		Yes
Project Total		1.36		Yes

Notes:

¹. DPM emissions are conservatively assumed to be equal to PM₁₀ emissions.

As shown in **Table 2**, DPM emissions from this project exceed the chronic trigger level listed in Table 2-5-1 of Regulation 2-5, and thus an HRA was required as part of this application.

An HRA was completed on June 4, 2024. The HRA focused on estimating the incremental health risk resulting from TAC emissions from the operation of a new auxiliary engine at this facility. Results from the HRA indicate that the project cancer risk is estimated at 0.55 in a million, and the project chronic hazard index (HI) is estimated at 0.00042.

Since the estimated project cancer risk does not exceed 6.0 in a million, and the estimated project chronic HI does not exceed 1.0, this project complies with the District's Regulation 2-5-302 project risk requirements for projects located in an Overburdened Community (OBC), as defined in Regulation 2-1-243.

Pursuant to Regulation 2-5-301, Best Available Control Technology for Toxics (TBACT) is required for any new or modified source of TACs where the source risk exceeds a cancer risk of 1.0 in a million and/or a chronic hazard index of 0.2. Although TBACT is not required because the estimated source risk does not exceed a cancer risk of 1.0 in a million and/or a chronic HI of 0.20, the portable engine in this application is defined as a non-road engine, and non-road engines are not subject to TBACT.

V. CUMULATIVE INCREASE

Table 3 summarizes the cumulative increase in criteria pollutant emissions that will result from this application.

Table 3: Facility Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (ton/year)	Application Emissions (ton/year)	Cumulative Emissions (ton/year)
NO _x	87.074	0.499	87.573
NMHC (POC)	7.390	0.003	7.393
CO	29.511	0.006	29.517
PM ₁₀	35.935	0.000	35.935
PM _{2.5}	0.000	0.000	0.000
SO ₂	40.702	0.001	40.703

VI. OFFSETS

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that will have the PTE more than 10 tons per year of POC or NO_x. Furthermore, pursuant to

Regulation 2-2-303, offsets must be provided for any new or modified source at a facility that will have the potential to emit 100 tons per year or more of PM_{2.5}, PM₁₀, or SO₂. **Table 4** provides a summary of the facility's PTE.

Table 4: Facility PTE

Pollutant	Existing Facility PTE (ton/year)	Application PTE (ton/year)	New Facility PTE (ton/year)	Offsets Requirement (ton/year)	Offsets Required?
NO _x	87.074	0.499	87.573	>10	Yes
POC	7.390	0.003	7.393	>10	No
CO	29.511	0.006	29.517	-	No
PM ₁₀ /PM _{2.5}	35.935	0.000	35.935	≥100	No
SO ₂	40.702	0.001	40.703	≥100	No

According to **Table 4**, the facility's PTE for NO_x is greater than 35 tons per year. Pursuant to Regulation 2-2-302.2, offsets must be provided for any un-offset NO_x cumulative increase at a 1.15:1 ratio. **Table 5** provides a summary of the offsets required for this facility.

Table 5: Facility Offsets Review

Pollutant	New Facility PTE (ton/year)	Offset Facility PTE (ton/year)	Un-Offset Facility PTE (ton/year)	Un-Offset Ratio Owed	Offsets Owed (ton/year)
NO _x	87.573	87.074	0.499	1.15:1	0.574
POC	7.393	--	--	--	--
CO	29.517	--	--	--	--
PM ₁₀	35.935	--	--	--	--
PM _{2.5}	0.000	--	--	--	--
SO ₂	40.703	--	--	--	--

The current application resulted in a 0.499 tons per year increase of NO_x. The facility has provided 0.574 tons per year of NO_x (0.499*1.15) offsets through Banking Certificate #1961.

VII. STATEMENT OF COMPLIANCE

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

District Rules

Regulation 1

Regulation 1-301 (Public Nuisance)

The facility is subject to Regulation 1-1-301, which prohibits discharge of air contaminants resulting in public nuisance.

The proposed diesel engine is a small sized, Tier 4 Final certified engine with a very low particulate emission factor of 0.002 g/bhp-hr. Because of this, the engine is not expected to be a source of public nuisance.

Regulation 6, Rule 1

The portable engine in this application is defined as a non-road engine, and non-road engines are not subject to Regulation 6, Rule 1.

Regulation 9, Rule 1

The portable engine in this application is defined as a non-road engine, and non-road engines are not subject to Regulation 9, Rule 1.

Regulation 9, Rule 8

The portable engine in this application is defined as a non-road engine, and non-road engines are not subject to Regulation 9, Rule 8.

State Rules

S-37 is not subject to the requirements of CARB's Air Toxic Control Measure (ATCM) for DPM from Portable Engines Rated at 50 Horsepower and Greater in Title 17, California Code of Regulations, Section 93116. S-37 is exempt from this ATCM per Subsection 93116.1(b)(9) because it is an engine used exclusively on a street sweeper that also meets all applicable requirements in title 13, Cal. Code Regs., commencing with section 2449.

This engine is instead subject to the requirements of California Code of Regulations (CCR), Title 13, Section 2025(n), which requires the auxiliary engine to meet the PM and NO_x BACT requirements as defined in this section. BACT requirements are defined as follows:

PM BACT: An engine equipped with the highest level of a verified diesel emission control strategy (VDECS) for PM or an engine originally equipped with a diesel particulate filter and has been certified to meet 0.01 g/bhp-hour certification standard.

NO_x BACT: An on-road engine newly manufactured in 2010 or later or a 2010 emissions-equivalent engine as defined in section 2025(d)(4).

As S-37 meets the emission requirements of a 2014+ year engine, the requirements of Section 2025 are met. In addition, the most stringent standards currently in effect for engines with capacities ranging from 37-56 kW (50-75 bhp) are the Tier 4 standards, which are 3.33 g/bhp-hr for NO_x, 0.18 g/bhp-hr for POC, 3.7 g/bhp-hr for CO, and 0.02 g/bhp-hr for PM₁₀. S-37 will comply with all of these Tier 4 limits.

Tier 4 standards exceed the standards of PM BACT as defined in this CCR. As such, S-37 complies with both the PM and NO_x BACT requirements of CCR Title 13, Section 2025 as it is a 2022 model year engine with a certified PM emission rate of 0.002 g/bhp-hr.

Federal Rules

New Source Performance Standards (NSPS)

40 CFR 60, Subpart IIII (Stationary Compression Ignition Internal Combustion Engines)

Since S-37 is a portable (non-road) engine and not a stationary engine, 40 CFR, Part 60, Subpart IIII does not apply to S-37.

40 CFR 1039 (Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines)

S-37 is subject to 40 CFR 1039 pursuant to Section 1039.1(a). S-37 is subject to the following Tier 4 exhaust emission standards in Table 1 of 1039.101:

Pollutant	S-37 Emission Factor g/bhp-hr (g/kW-hr)	NSPS Standard g/bhp-hr (g/kW-hr)
NHMC + NO _x	2.39 (3.2)	3.5 (4.7)
PM	0.002 (0.003)	0.02 (0.03)
CO	0.03 (0.04)	3.7 (5.0)

As shown above, S-37 complies with the emission standards in 40 CFR 1039.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

40 CFR 63, Subpart ZZZZ (Stationary Reciprocating Internal Combustion Engines (RICE))

Since S-37 is a portable (non-road) engine and not a stationary engine, 40 CFR, Part 63, Subpart ZZZZ does not apply to S-37.

California Health & Safety Code §42301.6 and Regulation 2-1-412 (Public Notice, Schools & Overburdened Communities)

Prior to approving an application for an authority to construct or permit to operate, a public notice, fully describing the potential emissions, shall be prepared for the following cases:

- (i) A new or modified source located within 1,000 feet of the outer boundary of a K-12 school site and which results in the increase in emissions of any substance into the ambient air which has been identified by the California Air Resources Board or the APCO as a toxic air contaminant or a hazardous air contaminant or which is on the list required to be prepared pursuant to subdivision (a) of Section 25532 or Section 44321 subsections(a) to (f) inclusive of the Health and Safety Code.
- (ii) A new or modified source located within an Overburdened Community (OBC) as defined in Section 2-1-243 and for which a Health Risk Assessment is required pursuant to Section 2-5-401.

S-37 is not located within 1,000 feet of any K-12 school, but it is located within an OBC and required an HRA. Because of this, S-37 is subject to the public notification requirements of Regulation 2-1-412. A public notice will be sent to all businesses and residents within 1,000 feet of the facility. All comments received shall be summarized in the final evaluation report.

California Environmental Quality Act (CEQA)

This permit application is not subject to CEQA because the evaluation is a ministerial action (Public Resources Code Section 21080(b)(1) and CEQA Guidelines Section 15268(a)) conducted using the fixed standards and objective measurements outlined in standard air permitting/engineering reference materials including, but not limited to: permitting handbooks, permitting manuals, and permitting guidance documents.

S-37 was reviewed in accordance with Chapter 2.3.3 (Portable Diesel Engines) of the District's Permit Handbook. The application is considered ministerial and is not subject to CEQA review.

VIII. PERMIT CONDITIONS

Permit Condition #100377 for S-37

Applies to S-37, Portable Street Sweeper Auxiliary Diesel Engine, Make: Kubota Corporation, 52.3 bhp

1. The owner/operator of S-37 has been issued permits for portable sources (also known as nonroad engines by federal definitions) that are subject to the CARB ATCM for diesel PM from portable engines. Based on these portable source and nonroad engine determinations, the engine is not subject to the CARB ATCM for stationary compression ignition engines, the federal NSPS requirements for stationary compression ignition engines (40 CFR, Part 60, Subpart IIII), or the federal NESHAP requirements for stationary reciprocating internal

combustion engines (40 CFR, Part 63, Subpart ZZZZ). To retain these portable source and nonroad engine determinations, the owner/operator shall not operate the engine in any one on-site location for more than 12 consecutive months. Any backup or standby engine that replaces this engine at the same on-site location and is intended to perform the same function will be counted towards this time limitation. The owner/operator shall not move equipment and then return it to the same location in an attempt to circumvent the portable equipment time requirement.

[Basis: CCR §93116.2(a)(28) and 40 CFR 1068.30]

2. The owner/operator of S-37 shall not exceed 3,650 hours during any consecutive 12-month period.

[Basis: Cumulative Increase and Offsets]

3. The owner/operator shall fire S-37 exclusively with ultra-low sulfur (<0.0015% sulfur by weight) CARB diesel fuel.

[Basis: Cumulative Increase and CCR §93116.3(a)]

4. The owner/operator shall equip the S-37 with a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine and is operated and properly maintained.

[Basis: Cumulative Increase and Offsets]

5. The owner/operator shall observe the exhaust of S-37 for visible smoke and if persistent smoke is detected, the owner/operator of the source shall take the necessary corrective action to stop the emissions.

[Basis: Regulation 6-1-303, 6-1-401, and 2-1-403]

6. To demonstrate compliance with the above conditions, the owner/operator of S-37 shall maintain the following records in a District-approved log and shall make these records available to the District staff upon request. All records shall be retained for at least two years from the date of entry. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District or state regulations.
 - a. On a monthly basis, record the hours of operation per calendar month for the engine.
 - b. If the engine is using fuel usage meters instead of operating time meters, record the fuel usage rate per engine on a monthly basis in addition to the calculated hours of operation for subpart a.
 - c. Summarize the total 12-month operating time for S-37 after the first 12 consecutive months of operation.
 - d. The owner/operator shall maintain annual records of engine operating locations, or other documentation, which demonstrates to the APCO's satisfaction that S-37 has satisfied the portability criteria in Part 1.

[Basis: Cumulative Increase, Offsets, CCR §93116.2(a)(28), and 40 CFR 1068.30]

End of Conditions

IX. 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 triggers the public notification requirements of Regulation 2-1-412. After comments from the public 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 and/or a Permit to Operate for the following equipment:

S-37 Portable Street Sweeper Auxiliary Diesel Engine
Make: Kubota Corporation, Model: V2403-CR-TE4B, 52.3 bhp

By: _____
Kristine Ferguson
Air Quality Engineer

Date: _____

DRAFT