

**PERMIT APPLICATION REVIEW
TEMPORARY COVERED SOURCE PERMIT (CSP) NO. 0535-01-CT
Permit Renewal Application No. 0535-03**

Company: G. Ibara Heavy Equipment Rentals

Facility: Crushing and Screening Plant

Location: Various Temporary Sites, State of Hawaii

Mailing Address: 227 Kaiwaipuna Place
Wailuku, Hawaii 96793

SIC Code: 1429 Crushed and Broken Stone, Not Elsewhere Classified

Responsible Official: Mr. Gregory Ibara
Owner
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Manufactured: 1988

Proposed Project:

G. Ibara Heavy Equipment Rentals has submitted a permit renewal application to operate a CEC 323 ton per hour jaw crusher plant with 240 kW diesel engine generator. The existing permit is for a temporary source with conditions that limit plant operation to 2,080 hours per year.

Process

Raw material (soil & stone) is dropped into the vibrating grizzly by a loader or excavator and passed to the primary jaw crusher. The crushed material drops on to a moving conveyor belt and is transported to a stockpile.

1. Equipment Description

The 323 TPH Construction Equipment Company jaw crushing plant, serial no. 8864, consists of the following equipment and associated appurtenances:

- a. 323 TPH jaw crusher (30" x 42" jaw size);
- b. Hopper;
- c. Vibrating grizzly feeder (46" x 16');
- d. Main discharge conveyor;
- e. Water spray system; and
- f. 240 kW Caterpillar diesel engine generator, model no. D343, serial no. 62B4566.

2. Applicable Requirements

2.1 Hawaii Administrative Rules (HAR)

Title 11 Chapter 59, Ambient Air Quality Standards

Title 11 Chapter 60.1, Air Pollution Control

Subchapter 1 - General Requirements

Subchapter 2 - General Prohibitions

11-60.1-31, Applicability

11-60.1-32, Visible Emissions

11-60.1-38, Sulfur Oxides From Fuel Combustion

Subchapter 4 - Noncovered Sources

Subchapter 5 - Covered Sources

Subchapter 6 - Fees for Covered Sources, Noncovered Sources, and Agricultural Burning

11-60.1-111, Definitions

11-60.1-117, General Fee Provisions for Noncovered Sources

11-60.1-118, Application Fees for Noncovered Sources

11-60.1-119, Annual Fees for Noncovered Sources

Subchapter 9 - Hazardous Air Pollutant Sources

Subchapter 10 - Field Citations

2.2 Prevention of Significant Deterioration (PSD) - 40 Code of Federal Regulations

(CFR) Part 52, §52.21 - Not applicable. This source is not subject to PSD requirements because it is not a major stationary source as defined in 40 CFR §52.21 and HAR, Title 11, Chapter 60.1, Subchapter 7.

2.3 Compliance Assurance Monitoring (CAM) - 40 CFR Part 64

Not subject to CAM because it is an existing facility and no major modification is done to the source. The purpose of CAM is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 CFR Part 64, for CAM to be applicable, the emissions unit must:

- (1) Be located at a major source;
- (2) Be subject to an emissions limit or standard;
- (3) Use a control device to achieve compliance;
- (4) Have potential pre-control emissions that are 100% of the major source level; and
- (5) Not otherwise be exempt from CAM

2.4 Standards of Performance for New Stationary Sources (NSPS) - 40 CFR Part 60

Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is not applicable to the diesel engine because this unit is a non-road engine as defined in 40 CFR §1068.30. Non-road engines are exempt from 40 CFR Part 60, Subpart IIII.

2.5 Standards of Performance for New Stationary Sources (NSPS) - 40 CFR Part 60

Subpart 000 - Standards of Performance for Nonmetallic Mineral Processing Plants is applicable to this plant because equipment was manufactured after 1983 (manufacturing date was indicated to be 1988) and the jaw crusher capacity is greater than 150 TPH.

2.6 National Emission Standards for Hazardous Air Pollutants (NESHAP) - 40 CFR Part 61

This source is not subject to NESHAP as there are no standards in 40 CFR Part 61 applicable to this facility.

2.7 National Emission Standards for Hazardous Air Pollutants (NESHAP) – 40 CFR Part 63

Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) - not applicable. The 360 hp Caterpillar diesel engine generator, model no. 343 is a non-road engine. Non-road engines are exempt from 40 CFR Part 63, Subpart ZZZZ.

2.8 Air Emissions Reporting Requirements (AERR) - 40 CFR Part 51, Subpart A

– This source is not subject to AERR. Emissions Inventory Reporting Requirements, determines AERR based on facility wide emissions of each air pollutant at the AERR triggering levels. The emissions here do not exceed respective AERR threshold levels.

2.9 Annual Emissions Reporting (DOH in-house)

Annual emissions reporting is required by the Clean Air Branch from those facilities that have facility wide emissions exceeding in-house reporting levels and for all covered sources. The facility is subject to annual emissions reporting because it is a **covered** source.

2.10 Best Available Control Technology (BACT)

This source is not subject to BACT analysis because it is an existing source with no proposed modifications. Potential emissions are below significant levels. BACT analysis is required for new sources or modifications to sources that have the potential to emit or increase emissions above significant levels considering any limitations as defined in HAR §11-60.1-1.

2.11 Synthetic Minor Source - A synthetic minor source is a facility that is potentially major, as defined in HAR §11-60.1-1, but is made non-major through federally enforceable permit conditions. This facility is not a synthetic minor source because potential emissions do not exceed major source thresholds (100 TPY) when the facility is operated without limitations for 8,760 hours/year.

3. Insignificant Activities/Exemptions

3.1 There were no insignificant activities reported by the applicant.

3.2 The 240 kW Caterpillar diesel engine generator, model no. D343, serial no. 62B4566 is exempt.

4. Alternate Operating Scenarios

The Department will incorporate provisions into the permit for allowing the permittee to replace the diesel engine generators with a temporary replacement unit of similar size with equal or lesser emissions if any repair reasonably warrants the removal of the diesel engines from its site (i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation).

5. Air Pollution Controls

5.1 According to the application, water sprays will be maintained at the jaw and each transfer point to control fugitive dust.

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5.2 The application indicates that material will be sprayed with water prior to loading material into the vibrating grizzly feeder.

5.3 A water spray truck is required by the existing permit for controlling dust at each work site.

6. Project Emissions

6.1 The NO_x, CO, PM, PM₁₀, PM_{2.5}, VOC, and HAP emissions were estimated using emission actors from AP-42, Section 3.3 (10/96), Gasoline and Diesel Industrial Engines. A mass balance calculation was used to determine SO₂ emissions based on the maximum allowable fuel sulfur content of 0.5% by weight and the rated 19 gallon per hour fuel consumption at the 240 kW rating. It was assumed that ninety-six percent (96%) of the total particulate was PM₁₀ and ninety percent (90%) of the total particulate was PM_{2.5} based on AP-42, Appendix B.2, Table B.2-2. A 2,080 hour per year limit was applied to estimate emissions. Emissions are shown in Enclosure (1) and summarized below.

240 kW DIESEL ENGINE GENERATOR				
Pollutant	Engine Emissions		Engine Emissions (TPY)	
	lb/hr	g/s	2,080 hours	8,760 hours
SO ₂	1.34	0.169	1.4	5.9
NO _x	11.38	1.437	11.8	49.8
CO	2.45	0.309	2.5	10.7
VOC	-----	-----	1.0	4.1
PM	-----	-----	0.9	3.6
PM ₁₀	0.80	0.101	0.8	3.5
PM _{2.5}	0.74	0.094	0.8	3.3
HAPs	-----	-----	0.017	0.075

6.2 Particulate emissions from the jaw crushing plant were based on emission factors from AP-42, Section 11.19.2 (8/04), Crushed Stone Processing and Pulverized Mineral. The controlled emission factors were used for crushing and conveyor transfer points. It was assumed that 51% PM was PM₁₀ and 15% PM was PM_{2.5} based on information from AP-42, Appendix B.2.2. Uncontrolled emission factors were used for truck loading and unloading and a 70% control efficiency for water sprays was applied because controlled emissions factors were not listed in AP-42 for these operations. The rated equipment capacity and 2,080 hr/yr operation was assumed to determine maximum potential emissions. Crushing plant emissions are shown in Enclosure (2) and summarized below.

CRUSHING PLANT		
Pollutant	Emissions (TPY) 2,080 hr/yr with Water Sprays	Total Plant Emissions (TPY) 8,760 hr/yr with Water Sprays
PM	0.5	2.1
PM₁₀	0.2	0.8
PM_{2.5}	0.06	0.3

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6.3 Stockpile emissions were determined with emission factors from AP-42, Section 13.2.4 (11/06), Aggregate Handling and Storage Piles. Emissions were based on the jaw crushing plant's capacity and 2,080 hr/yr operation. Emissions were also based on a 15 mile per hour wind speed, K value for PM of 0.74, K value for PM₁₀ of 0.35, K value for PM_{2.5} of 0.053, and a mean 2.525% material moisture content. A 70% control efficiency was applied to account for use of a water truck to control fugitive dust. Emissions are shown in Enclosure (3) and summarized in the table below.

STORAGE PILES			
Pollutant	Emission Factor (lb/ton)	Emission Rate (TPY)	
		2,080 hr/yr with water truck	8,760 hr/yr with water truck
PM	0.014	1.4	5.9
PM₁₀	3.4×10^{-3}	0.3	1.3
PM_{2.5}	5.1×10^{-4}	0.05	0.2

6.4 Emissions from vehicle travel were calculated using an emission factor equation for vehicles traveling on unpaved surfaces at industrial sites from AP-42, Section 13.2.2 (11/06) Unpaved Roads. Emission rates were based on the following assumptions:

- a. A distance of 3,181 vehicle miles traveled per year based the maximum plant capacity, 2,080 hr/yr operation, an average truck capacity of twenty-four (24) tons, and a 0.057 mile (300 feet) one way travel distance for the trucks;
- b. A k value for PM, PM₁₀, and PM_{2.5} of 4.9, 1.5, and 0.15, respectively based on data for industrial roads;
- c. An a value for PM, PM₁₀, and PM_{2.5} of 0.7, 0.9, and 0.9, respectively based on data for industrial roads;
- d. A b value for PM, PM₁₀, and PM_{2.5} of 0.45 based on data for industrial roads;
- e. An s (silt content of road) of ten percent (10%)
- f. A W (mean vehicle weight) of twenty-seven (27) tons;
- g. A p (# of days with at least 0.01" of rain/year) value of thirty-three (33) based on data from Lahaina;
- h. A seventy-percent (70%) control efficiency was applied to account for use of a water truck;
- i. Vehicle travel emissions are listed as follows:

VEHICLE TRAVEL			
Pollutant	Emission Factor (lb/VMT)	Emissions (TPY)	
		2,080 hr/yr with water truck	8,760 hr/yr with water truck
PM	3.17	5.0	21.2
PM₁₀	0.93	1.5	6.3
PM_{2.5}	0.093	0.1	0.6

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6.5 Total yearly emissions from operating the crushing plant are listed below as follows:

TPY TOTAL EMISSIONS (8,760 hr/yr) – With Water Sprays and Water Truck					
Pollutant	Crusher (only) Emission	240 kW Generator Emission	Plant Total (not including Storage Pile and Vehicle Traffic Emissions)	Vehicle Travel Emission	Storage Piles Emission
SO ₂		5.9	5.9		
NO _x		49.8	49.8		
CO		10.7	10.7		
VOC		4.1	4.1		
PM	2.1	3.6	5.7	21.2	5.9
PM ₁₀	0.8	3.5	4.3	6.3	1.3
PM _{2.5}	0.3	3.3	3.6	0.6	0.2
HAPS (Total)			0.075		

TPY TOTAL EMISSIONS (2,080 hr/yr) – With Water Sprays and Water Truck					
Pollutant	Crusher (only) Emission	240 kW Generator Emission	Plant Total (not including Storage Pile and Vehicle Traffic Emissions)	Vehicle Travel Emission	Storage Piles Emission
SO ₂		1.4	1.4		
NO _x		11.8	11.8		
CO		2.5	2.5		
VOC		1.0	1.0		
PM	0.5	0.9	1.4	5.0	1.4
PM ₁₀	0.2	0.8	1.0	1.5	0.3
PM _{2.5}	0.06	0.8	0.9	0.1	0.05
HAPS (Total)			0.017		

7. Air Quality Assessment

7.1 An ambient air quality impact analysis (AAQIA) is not required because no changes are proposed for the permit renewal that increase emissions.

8. Significant Permit Conditions

8.1 Incorporate applicable requirements from 40 CFR Part 60, Subpart OOO for the jaw crushing plant. Reason for 8.1: Incorporate the federal standards pursuant to Paragraph 2.4.

8.2 The operating hours of the jaw crushing plant with diesel engine shall not exceed 2,080 hours in any rolling twelve (12) month period. Reason for 8.2: The applicant has proposed a maximum 2,080 hours per year operation for the plant. This is an existing permit condition.

8.3 Specify a minimum stack height of twenty-two (22) feet for the diesel engine generator. Reason for 8.3: The air modeling assessment in the previous permit application review predicted compliance with the ambient air quality standards assuming a minimum diesel engine generator stack height of twenty-two (22) feet.

9. Conclusion and Recommendation:

9.1 Actual emissions from this facility should be lower than estimated. Maximum potential emissions were based on worst-case conditions assuming maximum rated capacity of the plant. Actual crushing capacity will vary depending on product size and the type of material, but will likely be much lower than the maximum rated capacity. Calculations were also based on 2,080 hours per year operation. The permit requires the use of a water spray system for compliance with fugitive dust regulations. The permit also requires the use of a water truck to control fugitive dust at sites where the jaw crushing plant is located. Recommend issuance of the temporary covered source permit subject to the significant permit conditions, the thirty-day (30-day) public comment period, and forty-five day (45-day) review by the Environmental Protection Agency.

Jensen I. Kennedy
6 March 2015