

**PERMIT APPLICATION REVIEW
TEMPORARY COVERED SOURCE PERMIT No. 0673-01-CT
Initial Permit Application No. 0673-02**

Applicant: Pacific Concrete Cutting & Coring, Inc.

Mailing Address: P.O. Box 662261
Lihue, Hawaii 96766

Facility: 250 TPH Mobile Impact Crusher with 390 HP Diesel Engine

Initial Location: TMK 3-8-004-001
Lihue, Kauai 96766

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SIC Code: 1429 (Crushed and Broken Stone, Not Elsewhere)

Equipment:

1. 320 TPH Hartl mobile impact crusher, model no. PC 1270 I, serial no. 724120075
2. 390 HP Caterpillar Diesel Engine, model no. 3176CDITA, serial no. 2AW01246
3. Water spray system
4. Various conveyors

BACKGROUND

Pacific Concrete Cutting & Coring, Inc. has submitted an application for an initial temporary covered source permit to operate a stone processing plant. The initial application received on May 13, 2008 was deemed incomplete because Form S-2 - Application for an Initial Covered Source Permit, and the application fee was not submitted. The additional information was received on August 4, 2008.

The materials to be processed will consist of basalt rock, other types of rocks encountered at job sites throughout the State of Hawaii, and other material such as concrete that are suitable for crushing and recycling. Material will be loaded into the crusher and transferred to storage piles on the main conveyor belt. The crushing plant will be powered by a 390 HP diesel engine fired on fuel oil No. 2 with less than 0.5% sulfur by weight. Fugitive emissions from the crusher will be controlled by water sprays. Fugitive emissions due to the stockpiles, yard area, and unpaved roads will be controlled by a water truck.

The typical hours of operation are 8 hours/day, 40 hours/week. The applicant has requested to limit the total operating hours of the mobile crusher to 11 hours per day and 1,800 hours in any rolling 12-month period. The length of stay at each job site varies from a few weeks to several months.

This facility is a covered source because it is subject to federal standards (NSPS Subpart OOO).

APPLICABLE REQUIREMENTS

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

11-60.1-33, Fugitive Dust

11-60.1-38, Sulfur Oxides from Fuel Combustion

Subchapter 5, Covered Sources

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

11-60.1-111, Definitions

11-60.1-112, General Fee Provisions for Covered sources

11-60.1-113, Application Fees for Covered sources

11-60.1-114, Annual Fees for Covered sources

11-60.1-115, Basis of Annual Fees for Covered Sources

Subchapter 8, Standards of Performance for Stationary Sources

11-60.1-161, New Source Performance Standards

Subchapter 10, Field Citations

This source is subject to NSPS (New Source Performance Standards).

40 CFR Part 60 Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants applies since the mobile crusher has a maximum capacity greater than 150 tons/hour and was manufactured after August 31, 1983.

This source is not subject to NESHAPS (National Emission Standards for Hazardous Air Pollutants) as no hazardous air pollutants are emitted at significant levels (> 10 TPY single HAP or > 25 TPY for total HAPs) and there are no NESHAPS requirements under 40 CFR Part 61.

This source is not subject to MACT (Maximum Achievable Control Technology) since the source is not a major source of hazardous air pollutants (HAPS) emissions (>10 TPY single hap or >25 TPY for total haps) and there are no MACT requirements under 40 CFR Part 63.

This source is not subject to PSD (Prevention of Significant Deterioration) 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; (criteria air pollutant > 100 or 250 TPY as applicable).

PROPOSED

This source is not subject to CAM (compliance assurance monitoring) since the permitted equipment is not classified as a major source (criteria pollutant > 100 TPY).

This source is not subject to CERR (Consolidated Emissions Reporting Requirements) since 40 CFR Part 51, Subpart A – Emissions Inventory Reporting Requirements, determines CERR based on facility wide emissions of each air pollutant at the CERR triggering levels. The emissions do not exceed respective CERR threshold levels. As such, emissions data will not be required to be inputted into the National Emissions Inventory (NEI) database.

The Clean Air Branch requests annual emissions reporting from those facilities that have facility wide emissions exceeding the DOH reporting level(s) and for all covered sources. Internal annual emissions reporting will be required because this is a covered source.

This source is not subject to BACT (Best Available Control Technology) analysis because potential to emit emissions are below significant levels as defined in HAR, Section 11-60.1-1. BACT analysis is required for new sources and significant modifications to sources that have the potential to emit or increase emissions above significant levels considering any limitations.

A synthetic minor source is a facility that is potentially major (as defined in HAR 11-60.1-1), but is made nonmajor through federally enforceable permit conditions. This facility is not a synthetic minor source because potential emissions do not exceed the major source thresholds when the facility is operated at its maximum capacity continuously for 8,760 hours per year.

INSIGNIFICANT ACTIVITIES / EXEMPTIONS

100 Gallon Diesel Fuel Tank

Insignificant activity in accordance with HAR §11-60.1-82(f)(1).

ALTERNATIVE OPERATING SCENERIOS

Diesel Engine

The applicant has requested to replace the permitted diesel engine with a temporary replacement unit of the same or smaller size if any repair reasonable warrants the removal of the diesel engine generator from its site (i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation).

AIR POLLUTION CONTROLS

Fugitive Emissions

The crusher is equipped with water spray bars with atomizer nozzles located over the impactor discharge point and the product conveyor head. Fugitive emissions from stockpiles, yard area, and trucks travelling on unpaved roads will be controlled by a water truck.

PROJECT EMISSIONS

Emission calculations are attached to this review. The following are the emissions due to the mobile crusher and diesel engine.

PROPOSED

250 TPH Crushed Stone Processing

Emission rates were based on the maximum capacity of the crushed stone processing plant to process 250 TPH of material and a limited operating time of 1,800 hours/year. The plant consists of a mobile impact crusher with a main conveyor belt. The crusher is equipped with water spray bars located over the discharge point and conveyor head to control PM emissions. The controlled emissions factors from AP-42 Section 11.19.2 (08/04) - Crushed Stone Processing and Pulverized Mineral Processing were used to calculate emissions. Emissions are summarized below.

Crushed Stone Processing			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [1,800 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	0.489	0.440	2.142
PM10	0.206	0.185	0.902
PM2.5	0.045	0.041	0.199

390 HP Diesel Engine

Emission rates were based on a limit of 1,800 hours/year. The diesel engine is fired on fuel oil No. 2 with less than 0.5% sulfur by weight, with a maximum fuel consumption of 19.3 gallons/hour based on manufactures literature. Emissions were based on emission factors from AP-42 Section 3.4 (10/96) - Gasoline and Diesel Industrial Engines. The mass balance method was used to determine the SO₂ emission rate.

Diesel Engine			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [1,800 hr/yr]	Emissions (TPY) [8,760 hr/yr]
NO _x	11.660	10.494	51.073
CO	2.512	2.261	11.002
SO ₂	1.359	1.223	5.952
PM	0.820	0.738	3.590
PM-10	0.820	0.738	3.590
PM-2.5	0.820	0.738	3.590
TOC	0.925	0.833	4.053
HAP	0.010	0.009	0.044

Notes:

SO₂ emission = mass of S in fuel (lb/gal) * (MW of SO₂ / MW of S)

SO₂ emission = 0.68 lb/hr * (64.06 g/mol / 32.07 g/mol) = 1.36 lb/hr

where mass of S in fuel = fuel rate (19.3 gal/hr) * fuel mass (7.05 lb/gal) * 0.5% S = 0.68 lb/hr

Storage Piles

Emission rates were based on the maximum capacity of the crusher to process 250 TPH of material and a limited operating time of 1,800 hours/year. A 70% control efficiency was assumed for fugitive dust control.

PROPOSED

Storage Piles			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [1,800 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	2.127	1.914	9.316
PM10	1.006	0.905	4.406
PM2.5	0.152	0.137	0.667

Truck Travelling on Unpaved Road

Emission rates were based on the maximum capacity of the crusher to process 250 TPH of material and a limited operating time of 1,800 hours/year. A 70% control efficiency was assumed for fugitive dust control. The average vehicle weight was assumed to be 26.5 tons. The total miles traveled was assumed to be 5357 VMT/year.

Truck Travelling on Unpaved Road			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [1,800 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	2.415	2.173	10.576
PM10	0.590	0.531	2.586
PM2.5	0.059	0.053	0.259

Total Emissions

Total facility emissions are summarized in the table below.

Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Emissions [Limited hr/yr]	Emissions [8,760 hr/yr]	BACT Significant Level	CERR Triggering Level (Type A sources / Type B sources)	DOH Level
NO _x	10.49	51.07	40	2,500 / 100	25
CO	2.26	11.00	100	2,500 / 1000	250
SO ₂	1.22	5.95	40	2,500 / 100	25
PM	5.27	25.62	25	-	25
PM-10	2.36	11.48	15	250 / 100	25
PM-2.5	0.97	4.71	-	250 / 100	-
VOC/TOC	0.83	4.05	40	250 / 100	25
HAP	0.01	0.04	-	-	5

AIR QUALITY ASSESSMENT

An ambient air quality assessment (AAQA) was performed for the 390 HP diesel engine to demonstrate compliance with State and National Ambient Air Quality Standards. The SCREEN3 screening model was used.

Assumptions for the SCREEN3 model include:

PROPOSED

- a. Unit emission rate of 1 g/s;
- b. Ambient temperature of 293 °K;
- a. Flat terrain impact;
- b. Rural dispersion parameters;
- c. Wake effects from crusher (HxLxW = 3.2 m x 12.8 m x 2.5 m);
- d. Default meteorology.

The table below presents the emission rates and stack parameters used for the AAQA.

	Emission Rates (g/s)					Stack Parameters			
	NO ₂	SO ₂	PM-10	PM-2.5	CO	Height (m)	Temp (°K)	Flow Rate (m/s)	Diameter (m)
Diesel Engine	1.4691	0.1712	0.1033	0.1033	0.3165	4.0	779.6	1.048	0.2032

The result of the SCREEN3 model for the maximum 1-hour concentration was 1141 µg/m³, occurring at a distance of 27 meters from the source.

The predicted concentrations assume an annual limit of 1800 hours/year, daily limit of 11 hours/day, and assume they are operating at their maximum capacity. The emissions impact from the diesel engine demonstrates compliance with State and National Ambient Air Quality Standards as shown in the following table.

Predicted Ambient Air Quality Impacts							
Air Pollutant	Averaging Time	Impact (µg/m ³)	Background (µg/m ³)	Total Impact (µg/m ³)	SAAQs (µg/m ³)	NAAQS (µg/m ³)	Compared to SAAQS
NO ₂	Annual	51.7	9	60.7	70	100	86.7%
SO ₂	3-hr	175.8	81	256.8	1300	1300	19.8%
	24-hr	35.8	24	59.8	365	365	16.4%
	Annual	8.0	5	13.0	80	80	16.3%
PM-10	24-hr	21.6	57	78.6	150	150	52.4%
	Annual	4.8	17	21.8	50	50	43.7%
PM-2.5	24-hr	21.6	10	31.6	-	35	90.3%
	Annual	4.8	5	9.8	-	15	65.6%
CO	1-hr	361.1	4332	4693.1	10000	40000	46.9%
	8-hr	252.8	1235	1487.8	5000	10000	29.8%

notes:

1. Applied EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hour, 8-hour, and 24-hour concentrations are used, respectively. State of Hawaii scaling factor of 0.2 is used for annual concentrations.
2. NO_x to NO₂ conversion based on EPA Tier 2 approach. NO₂ / NO_x = 0.75.
3. Background concentrations were taken from Hawaii Air Quality Data 2007. There are no background concentrations for the island of Kauai. The maximum background concentrations from the island of Oahu were used:
 NO₂ from Kapolei
 SO₂ from Makaiwa
 PM₁₀ from Kapolei
 PM_{2.5} from Sand Island
 CO (1-hr) from Kapolei, CO (8-hr) from Honolulu

SIGNIFICANT PERMIT CONDITIONS

1. The total operating hours of the crushing plant, as represented by the total operating hours of the diesel engine, shall not exceed 11 hours per day and 1,800 hours in any rolling 12-month period.
2. The minimum stack height of diesel engine shall be 4 meters (13.1 feet) above base elevation

CONCLUSION

Actual emissions should be lower than estimated because the mobile crusher will not be operating at its maximum capacity for 1,800 hours/year. The ambient air quality assessment demonstrates compliance with State and National Ambient Air Quality Standards. Recommend issuance of the temporary covered source permit subject to the incorporation of the significant permit conditions, 30-day public comment period, and 45-day Environmental Protection Agency review period.

Mark Saewong
February 4, 2009