

**PERMIT APPLICATION REVIEW
TEMPORARY COVERED SOURCE PERMIT NO. 0739-01-CT
Application for Initial Review No. 0739-01
Amendment 01 April 4, 2011**

Company: Jayar Construction, Inc.

Mailing Address: 1176 Sand Island Parkway
Honolulu, Hawaii 96819

Facility: Crushing and Screening Plants

Location: Various Temporary Sites, State of Hawaii

Initial Location: Aliamanu Military Reservation, Honolulu, Oahu
(UTM Zone 4: East 613,724 North 2,362,793)

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

Responsible Official: Mr. Alfredo Udani
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Equipment:

1. 350 TPH BL-Pegson mobile impact crushing plant with built-in screen, model no. 4242SR, serial no. unknown (manufactured in 2007), with:
 - a. Vibrating feeder;
 - b. Various conveyors;
 - c. 5' X 11' single deck screen;
 - c. Water spray system; and
 - d. 325 HP Caterpillar diesel engine, model no. C-9, serial no. unknown (April 2007);

BACKGROUND

Jayar Construction, Inc. has submitted an initial application to operate a mobile self-powered crushing plant. The 350 TPH crushing plant consist of an impact crusher with a built-in screen and various conveyors. The crushing plant is track mounted and powered by a 325 HP diesel engine generator (Tier 3). Water sprays and a water truck will be used to control fugitive emissions.

The mobile track mounted crusher is powered by a 325 HP Cat C-9 diesel engine. The total operating hours of the crusher will be unlimited (8760 hours in any rolling twelve-month (12-month) period).

Process

Raw material is dropped into the vibrating feeder by a loader and passed to the impact crusher. The crushed material drops onto a moving conveyor belt and is transported to the screen where it is size segregated and the oversize material is conveyed back to the crusher. The product material is conveyed to one stockpile.

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 9, Hazardous Air Pollutant Sources

Subchapter 10, Field Citations

Standard of Performance for New Stationary Sources (NSPS), 40 CFR Part 60

Subpart 000 – Standards of Performance for Nonmetallic Mineral Processing Plants is applicable to the crushing plant (manufactured in 2007) because the maximum capacity of the facility is greater than 150 tons/hour, and the crushing plant were manufactured after August 31, 1983.

Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is not applicable to the 325 HP diesel engine because the engine is considered a nonroad engine as defined in 40 CFR §1068.30. Subpart IIII applies to stationary internal combustion engines that are not mobile/nonroad engines.

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.

National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP) (Maximum Achievable Control Technology (MACT)), 40 CFR Part 63

Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) is not applicable to the 325 HP diesel engine because the engine is considered a nonroad engine as defined in 40 CFR §1068.30. Subpart ZZZZ applies to stationary internal combustion engines that are not mobile/nonroad engines.

Prevention of Significant Deterioration (PSD), 40 CFR Part 52, §52.21

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.

Compliance Assurance Monitoring (CAM), 40 CFR 64

This source is not subject to CAM because the facility is not a major 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 Code of Federal Regulations, 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.

Consolidated Emissions Reporting Rule (CERR), 40 CFR Part 51, Subpart A

CERR is not applicable because emissions from the facility do not exceed CERR triggering levels.

DOH In-house Annual Emissions Reporting

The Clean Air Branch requests annual emissions reporting from those facilities that have facility wide emissions exceeding in-house reporting levels and for all covered sources. Annual emissions reporting will be required because this facility is a covered source.

Best Available Control Technology (BACT)

This source is subject to BACT analysis because the crusher potential emissions exceed BACT significant levels for PM (PM-10 and PM-2.5 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.

Fugitive emissions from crushing, screening operations, and transfer points will be controlled by water sprays. Fugitive emissions due to storage piles and unpaved roads will be controlled by a water truck. Wet suppression to control fugitive emissions for stone processing plants is considered BACT.

The diesel engine, not subject to BACT, is Tier 3 using ULSD fuel oil #2 with sulfur content not to exceed 15 ppm.

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 when the facility is operated without limitations for 8,760 hours/year.

INSIGNIFICANT ACTIVITIES / EXEMPTIONS

None.

ALTERNATIVE OPERATING SCENARIOS

Diesel Engine

The permittee may replace the diesel engine with a temporary replacement unit of similar size with equal or lesser emissions if any repair reasonably warrants the removal of the diesel engine from its site (i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation with twelve-month (12-month) replacement limit)

AIR POLLUTION CONTROLS

The crushing plant with built-in screen are equipped with water spay systems to control fugitive dust. Water trucks/water sprays will be used as necessary to minimize fugitive dust from plant operations, material transfer points, stockpiles, and plant roads.

PROJECT EMISSIONS

Operating hours for the crushing plant with built-in screen will be unlimited (8,760 hours in any rolling twelve-month (12-month) period).

350 TPH Impact Crushing Plant

The maximum capacity of the crusher was used to calculate emissions. Water sprays will be used to control PM emissions. Emissions were based on emission factors from AP-42 Section 11.19.2 (8/04) - Crushed Stone Processing and Pulverized Mineral Processing.

Storage pile emissions were based on emission factors from AP-42 Section 13.2.4 (11/06) - Aggregate Handling and Storage Piles. Vehicle travel on unpaved roads emissions were based on emission factors from AP-42 Section 13.2.2 (11/06) - Unpaved Roads. A 70% control efficiency was assumed for water suppression to control fugitive dust for unpaved roads.

350 TPH Crushing Plant						
Pollutant	Crushing Plant Emissions (TPY)		Storage Piles Emissions (TPY)		Unpaved Roads Emissions (TPY)	
	8,760 hr/yr	8,760 hr/yr	8,760 hr/yr	8,760 hr/yr	8,760 hr/yr	8,760 hr/yr
PM	2.83	2.43	10.93	10.93	32.56	32.56
PM-10	1.22	1.22	5.17	5.17	7.96	7.96
PM-2.5	0.27	0.27	0.78	0.78	0.80	0.80

PROPOSED

325 bhp Caterpillar C9 Diesel Engine

The 325 hp diesel engine is fired on fuel oil no. 2 ULSD with a maximum sulfur content not to exceed 15 ppm. CO, NO_x, PM, and TOC emissions were based on manufacturer's "not to exceed" data. The mass balance method was used to determine SO₂ emissions. HAP emissions were based on emission factors from AP-42 Section 3.3 (10/96) - Gasoline and Diesel Industrial Engines.

325 bhp Caterpillar Diesel Engine			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [8,760 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	1.79	7.84	7.84
NO _x	2.40	10.51	10.51
SO ₂	0.0048	0.02	0.02
PM	0.09	0.39	0.39
PM-10	0.09	0.39	0.39
PM-2.5	0.08	0.35	0.35
TOC	0.19	0.83	0.83
HAPs	0.009	0.04	0.04

Storage pile emissions were based on emission factors from AP-42 Section 13.2.4 (11/06) - Aggregate Handling and Storage Piles. Vehicle travel on unpaved roads emissions were based on emission factors from AP-42 Section 13.2.2 (11/06) - Unpaved Roads. A 70% control efficiency was assumed for water suppression to control fugitive dust for unpaved roads.

Fugitive Emissions			
Pollutant		Storage Piles Emissions (TPY)	Unpaved Roads Emissions (TPY)
		8,760 hr/yr	8,760 hr/yr
PM	0	10.93	32.56
PM-10	0	5.17	7.96
PM-2.5	0	0.78	0.80

Total Emissions

Total facility emissions are summarized in the table below.

Total Facility Emissions and Trigger Levels (TPY)					
Pollutant	Emissions (Limited)	Emissions (No Limits 8,760 hr/yr)	BACT Significant Level	CERR Triggering Level (Type A sources / Type B sources)	DOH Level
CO	7.8	7.8	100	2,500 / 1000	250
NO _x	10.5	10.5	40	2,500 / 100	25
SO ₂	0	0	40	2,500 / 100	25
PM	46.7	46.7	25	-	25
PM-10	14.7	14.7	15	250 / 100	25
PM-2.5	2.2	2.2	-	250 / 100	-
VOC	0.8	0.8	40	250 / 100	25
HAPs	0.04	0.04	-	-	5

Limited 8760 hrs

AIR QUALITY ASSESSMENT

An ambient air quality impact assessment (AAQIA) was performed for the 325 HP diesel engine powering the 350 TPH mobile crusher with built-in screen to demonstrate compliance with State and National ambient air quality standards. The AERMOD model was used for the analysis to determine maximum pollutant impacts. Lakes Environmental AERMOD View, Version 6.7.1, was used for the AERMOD modeling analysis. The ozone limiting method (OLM) for NO₂ was used within AERMOD. ULSD fuel oil no. 2 is used to control SO_x.

Terrain

A USGS 7.5 min digital elevation model (DEM) with 10 meter spacing from the Peal Harbor, Oahu, Hawaii quadrangle was used to model the elevated terrain heights.

Meteorological data

As provided by consultant, 2005 to 2009 meteorological data from CAB data base (5 year).
As provided by consultant, 2005 to 2009 ozone data from CAB data base (5 year).

Receptor Grid

Receptor grid spacing was set at 30 meters.

Dispersion Coefficient

Rural dispersion coefficient was selected.

Building Downwash

The EPA's Building Profile Input Program (BPIP) was used to evaluate downwash effects of nearby structures.

Emission Rates and Stack Parameters

The short term emission rates and stack parameters used in the analysis are shown in the table below. The emission rates were based on unlimited 8760 hours per year operation.

Source	Emission Rates (g/s)					Stack Parameters			
	CO	NO _x	PM-10	PM-2.5	SO ₂	Height (m)	Diameter (m)	Flow Rate (m ³ /s)	Temp (°K)
Diesel Engine Generator	0225	0.302	0.011	0.010	0.001	3.44	0.15	0.96	740

Results

The annual concentrations assume annual fuel limits equivalent to 3,000 hours/year. The table below shows the predicted ambient air quality impacts from the baghouse servicing the drum mixer/dryer, diesel engine generator, and hot oil heater should comply with State and National ambient air quality standards

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
CO	1-hr	280	2517	2797	10000	40000	27.9%
	8-hr	227	801	1028	5000	10000	20.5%
NO ₂	1-hr ⁴	44	26	70		100	70%
NO ₂	Annual	22	8	30	70	100	30%
PM-10	24-hr	9.3	61	70.3	150	150	46.8%
	Annual	3.6	18	21.6	50	-	43.2%
PM-2.5	24-hr	8.3	12	20.3	-	35	58%
	Annual	3.1	4.1	7.2	-	15	48%
SO ₂	1-hr ⁴	0.0001	17	17		75	22.6%
SO ₂	3-hr	0.5	24	24.5	1300	1300	1.8%
	24-hr	0.38	13	13.3	365	365	3.8%
	Annual	0.14	3	3.1	80	80	3.8%

notes:

1. 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. Background concentrations from 2008 Hawaii Air Quality Data. Maximum background concentrations for CO, NO₂, SO₂ and PM taken from Kapolei, Oahu (2008). PM-2.5 98th percentile used.
3. Assume total conversion of NO_x to NO₂.
4. 1-hr NO₂ and SO₂ values in PPB.

SIGNIFICANT PERMIT CONDITIONS

1. The total operating hours of the 350 TPH mobile crushing plant with built-in screen and 325 HP diesel engine is unlimited, therefore an hour meter shall not be required.
2. The 325 HP Tier III diesel engine shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 15 ppm as required by the manufactures specifications.
3. The permittee shall not cause to be discharged into the atmosphere from the crusher, fugitive emissions which exhibit greater than fifteen (15) percent opacity.

PROPOSED

4. The permittee shall not cause to be discharged into the atmosphere from any transfer point on the belt conveyors, screening operation, or from any other affected facility, fugitive emissions which exhibit greater than ten (10) percent opacity.

CONCLUSION

Jayar Construction application is for an initial permit to operate a 350 TPH mobile track mounted crushing plant in with built-in screen powered by a 325 HP Tier III diesel engine. Water sprays will be used to control fugitive emissions. Potential emissions were based on the maximum rated capacities of the equipment.

The air quality assessment of the Tier III diesel engine demonstrated compliance with State and National ambient air quality standards. Recommend issuance of the 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.

Gary Siu
April 15, 2011