

PROPOSED

Temporary Covered Source Permit Review Summary

Application File No.: 0467-02

Permit No.: 0467-01-CT

Applicant: Hawaiian Dredging Construction Company

Facility Title: Portable 1500 TPH Stone Quarrying and Processing Plant
with 810 hp Diesel Engine Generator
Located at Yamada and Sons, Inc., 733 Kanoelehua Avenue, Hilo,
Hawaii

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Application Date: Received on August 31, 2004

Proposed Project:

The Standard Industrial Classification (SIC) Code is 1442 under *Construction Sand and Gravel*.

This application is for the renewal of Temporary Covered Source Permit (CSP) No. 0467-01-CT) for a portable 1500 TPH stone quarrying and processing plant. A check for \$500.00 was also submitted by the applicant for a renewal of a temporary covered source permit (non-air toxic) and processed.

This stone quarrying and processing plant processes raw material, consisting of basalt rock or concrete. Material to be crushed is loaded into the grizzly feeder of the Cedarapids 3054 jaw crusher by a front end loader. If concrete with rebars are to be crushed, a magnet located at the end of the conveyor belt no. 1 removes the metal from the crushed rock. From conveyor no. 1, the material is transferred to conveyor belt no. 2, which transports it onto a surge pile. A tunnel conveyor belt no. 3 moves the material from the surge pile to conveyor belt no. 4. A second magnet situated at the end of conveyor belt no. 3 removes any remaining metal pieces and/or rebar. Conveyor belt no. 4 moves the material into the top screen of the 3-deck

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Cedarapids 6203-38 screen. Oversize material from the top screen is crushed again by the Cedarapids MVP 380 rollercone crusher. The crushed material exits by a chute onto conveyor belt no. 5, which returns it to conveyor belt no. 3 in a closed loop. The material from the middle screen travels on conveyor belt no. 6 to the radial stacker no. 7 onto a stock pile. Material from the bottom screen is moved on conveyor belt no. 8 onto a stock pile.

Electricity for the plant is supplied by a 810 hp diesel engine generator. Diesel fuel is stored in a 600 gallon diesel fuel tank.

Site Inspection:

Ed Yamamoto (CAB inspector) made a site inspection at the plant in December 2004. The plant was not in operation and had been disassembled since it was moved to a new location. Ed verified the model and serial numbers on the equipment nameplates. Also, photos taken of the equipment indicated that the exhaust stack for the 810 hp diesel engine generator had not been constructed to the height indicated in the initial Title V application and needed to be raised. The renewal permit will include a certification of the stack height.

Equipment Description:

Portable 1500 TPH Stone Quarrying and Processing Plant

1. One (1) 52" x 20' Cedarapids Vibrating Grizzly Feeder, Model No. 5220VGF, Serial No. 50814, manufacturing date - 2000, electric powered;
2. One (1) 1500 TPH Cedarapids Primary Jaw Crusher, Model No. 3054, Serial No. 50764, manufacturing date - 2000, electric powered;
3. One (1) 380 TPH Cedarapids Cone Crusher, Model No. RC54, Serial No. 2310792, manufacturing date - 2000, electric powered;
4. One (1) 5' x 16' Cedarapids 3-Deck Screen, Model No. 5163-26, Serial No. 34C1492, manufacturing date - 2000, electric powered;
5. Radial Stacker and Miscellaneous Conveyors;
6. Waterspray system consisting of thirteen (13) waterspray bars located throughout the plant as indicated in the Air Pollution Control Section below;
7. One (1) 810 hp Caterpillar Diesel Engine Generator, Model No. 3412DI, Serial No. 81Z09827, fired on diesel fuel no. 2, max. fuel consumption rate - 39.9 gal/hr, stack parameters - diameter = 0.3048 m, height = 6.4 m, exhaust temp.= 750 deg K, exhaust flow = 2.165 m³/s, velocity = 29.671 m/s

Air Pollution Controls:

1. Maximum sulfur content of the diesel fuel no. 2 fired in the diesel engine generator shall not exceed 0.5 % by weight.
2. The stone quarrying and processing plant is equipped with water sprays to control fugitive dust. Water sprays are located at crushers, screen, transfer points, material drop off points and stockpiles.
3. Stockpiles, crushing area and unpaved access roads are controlled by means of a water truck.

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
HAR 11-60.1-31	Applicability
HAR 11-60.1-32	Visible Emissions
HAR 11-60.1-33	Fugitive Dust
HAR 11-60.1-38	Sulfur Oxides from Fuel Combustion
Subchapter 5	Covered Sources
Subchapter 6	Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
HAR 11-60.1-111	Definitions
HAR 11-60.1-112	General Fee Provisions for Covered Sources
HAR 11-60.1-113	Application Fees for Covered Sources
HAR 11-60.1-114	Annual Fees for Covered Sources
Subchapter 8	Standards of Performance for Stationary Sources
HAR 11-60.1-161	New Source Performance Standards

Federal Requirements

- 40 CFR Part 60 - Standards of Performance for New Stationary Sources (NSPS)
 - Subpart A: General Provisions
 - Subpart OOO: Standards of Performance for Nonmetallic Mineral Processing Plants

Non-applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11, Chapter 60.1	Air Pollution Control
Subchapter 7	Prevention of Significant Deterioration
Subchapter 9	Hazardous Air Pollution Sources

Federal Requirements

- 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants (NESHAP)
- 40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)
- 40 CFR Part 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. (RICE NESHAP)

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is required for new sources or significant modifications to covered sources that have the potential to cause an increase in air pollutant emissions above significant levels as defined in HAR 11-60.1. There are no proposed changes for this renewal application. Therefore, a BACT analysis is not required for this permit renewal.

Prevention of Significant Deterioration (PSD):

This source is not a major stationary source nor are there modifications proposed that by itself constitute a major stationary source that is subject to PSD review. Therefore, PSD is not applicable.

Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on the emissions of criteria air pollutants from Type B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels as shown in the table below.

Pollutant	Type B CER Triggering Levels ¹ (tpy)	Pollutant	In-house Total Facility Triggering Levels ² (tpy)	Total Facility Emissions ² (tpy)
NO _x	≥ 100	NO _x	≥ 25	18.19
SO ₂	≥ 100	SO ₂	≥ 25	2.90
CO	≥ 1000	CO	≥ 250	4.83
PM ₁₀ /PM _{2.5}	≥ 100/100	PM/PM ₁₀	≥ 25/25	PM=41.57, PM ₁₀ =14.08 PM _{2.5} =2.87
VOC	≥ 100	VOC	≥ 25	0.51
		HAPS	≥ 5	

¹ Based on actual emissions

² Based on potential emissions

This facility does not emit at the CER triggering levels. Therefore, CER requirements are not applicable.

Although CER for the facility is not triggered, the Clean Air Branch requests annual emissions reporting from those facilities that have *facility-wide* emissions of a single air pollutant exceeding in-house triggering levels. Annual emissions from these facilities are used within the Department and are not inputted into the National Emissions Inventory database. Since the total emissions of PM within the facility is greater than 25 tons per year, annual emissions reporting for the 810 hp diesel engine generator and the stone processing plant will be required for in-house recordkeeping purposes.

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Compliance Assurance Monitoring (CAM):

40 CFR Part 64

Applicability of the CAM rule is determined on a pollutant specific basis for each affected emission unit. Each determination is based upon a series of evaluation criteria. In order for a source to be subject to CAM, each source must:

- Be located at a major source per Title V of the Clean Air Act Amendments of 1990;
- Be subject to federally enforceable applicable requirements;
- Have pre-control device potential emissions that exceed applicable major source thresholds;
- Be fitted with an “active” air pollution control device; and
- Not be subject to certain regulations that specifically exempt it from CAM.

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant.

This source is not subject to Compliance Assurance Monitoring (CAM) since this facility is not a major source required to obtain a Part 70 permit.

Synthetic Minor Source:

This facility is a synthetic minor source as the facility would be classified as a major source *without* operational limitations (i.e., operating at 8760 hrs/year), however, is classified as a non-major source through the use of operational restrictions of 2080 hrs/yr for the 810 hp diesel engine generator and an annual production limit of 1,000,000 tons per year for the 1500 TPH primary jaw crusher.

Insignificant Activities:

1. *Per HAR 11-60.1-82(f)(1)*
One (1) 600 gallon diesel fuel tank

Alternate Operating Scenarios:

The applicant proposed the following alternate operating scenario be added to the renewal permit:

The permittee may replace the diesel engine generator with a temporary replacement unit if any repair work (i.e., equipment failure, engine overhaul, or any major equipment problems requiring maintenance for efficient operation) reasonably warrants the removal of the diesel engine generator from its site.

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Project Emissions:

- Emissions for 810 hp diesel engine generator** - Calculated at 2080 hrs/yr at a maximum fuel consumption rate of 39.9 gal/hr.

Example: $\text{tpy} = \text{EF} \times (137,000 \text{ Btu/gal}) \times (39.9 \text{ gal/hr}) \times (1 \text{ MMBtu} / 1,000,000 \text{ Btu}) \times (2080 \text{ hrs/yr}) \div (2000 \text{ lb/ton})$

Pollutant	Emission Factors (lb/MMBtu)	Emission Rate (lb/hr)	Controlled Annual Emissions (tpy) (@ 2080 hrs/yr)
NO _x	3.2	17.49	18.19
CO	0.85	4.65	4.83
SO ₂	0.51	2.79	2.90
PM	0.0697	0.38	0.40
PM ₁₀	0.0573	0.31	0.33
PM _{2.5}	0.0479	0.26	0.27
VOC	0.09	0.49	0.51
Benzene	7.76 E-04	4.24 E-03	4.41 E-03
Toluene	2.81 E-04	1.54 E-03	1.60 E-03
Xylenes	1.93 E-04	1.05 E-03	1.10 E-03
Propylene	2.79 E-03	1.53 E-02	1.59 E-02
Formaldehyde	7.89 E-05	4.31 E-04	4.49 E-04
Acetaldehyde	2.52 E-05	1.38 E-04	1.43 E-04
Acrolein	7.88 E-06	4.31 E-05	4.48 E-05
Naphthalene	1.30 E-04	7.11 E-04	7.39 E-04
HAPS			2.44 E-02

Emission factors from AP-42 (10/96), Table 3.4-1. Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual-Fuel Engines; Table 3.4-2. Particulate and Particle-Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines; Table 3.4-3. Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines; and Table 3.4-4. PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines.

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2. **Emissions for Stone Processing Operations** - Calculations based on 1500 TPH maximum processing rate at a maximum of 1,000,000 tons per year using watersprays for controls.

Source	Pollutant	Emission Factors ⁴ (lb/ton)	Emission Rate (lb/hr)	Controlled Annual Emissions (tpy)
Primary crushing (controlled)	PM _{2.5}	0.00072 ¹	1.08	0.36
	PM ₁₀	0.00072 ¹	1.08	0.36
	PM	0.0016 ¹	2.40	0.80
Secondary crushing (controlled)	PM _{2.5}	0.00072 ¹	1.08	0.36
	PM ₁₀	0.00072 ¹	1.08	0.36
	PM	0.0016 ¹	2.40	0.80
Screening (controlled)	PM _{2.5}	0.00005 ¹	0.075	0.025
	PM ₁₀	0.0026 ¹	3.90	1.30
	PM	0.0075 ¹	11.25	3.75
Conveyor transfer points (controlled) (13 transfer points)	PM _{2.5}	1.3 E-05 ¹	0.02	0.007(13) = 0.085
	PM ₁₀	0.00033 ¹	0.50	0.17(13) = 2.15
	PM	0.00090 ¹	1.35	0.45(13) = 5.85
Truck unloading: fragmented stone	PM _{2.5}	0.000005 ¹	0.0075	0.0025
	PM ₁₀	0.000016 ¹	0.024	0.008
	PM	0.000031 ¹	0.0465	0.0155
Truck loading-conveyor: crushed stone	PM _{2.5}	0.00003 ¹	0.045	0.015
	PM ₁₀	0.00010 ¹	0.150	0.050
	PM	0.00020 ¹	0.30	0.10
Wind erosion: storage piles	PM _{2.5}	0.004 ²		0.60
	PM ₁₀	0.013 ²	-----	1.95
	PM	0.028 ²	-----	4.20
Vehicle traffic: unpaved roads	PM _{2.5}	0.62 lb/VMT ³		1.16
	PM ₁₀	4.04 lb/VMT ³	-----	7.57
	PM	13.68 lb/VMT ³	-----	25.65
Total	PM _{2.5}			2.6
	PM ₁₀			13.75
	PM			41.17

¹ Emission factors from AP-42, Table 11.19.2-2. Emission Factors for Crushed Stone Processing Operations (8/04). Controlled emission factors were calculated using uncontrolled emission factors with a control efficiency of 70%. PM_{2.5} derived using AP-42, Appendix B.2 (9/90), Table B.2.2, Category 3.

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² Emission factors from AP-42, Section 13.2.4. Aggregate Handling and Storage Piles (1/95)

$$E = k(0.0032) \times [(U/5)^{1.3} / ((M/2)^{1.4})]$$

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless) = 0.11 (PM_{2.5}), 0.35 (PM₁₀), 0.74 (PM)

U = mean wind speed (mph) = 10.9 (state avg.)

M = material moisture content (%) = 0.7

control efficiency = 70%, assuming a watertruck for stockpiles

³ Emission factors from AP-42, Section 13.2.2. Unpaved Roads (12/03)

$$E = k \times (s/12)^a \times (W/3)^b$$

E = size-specific emission factor (lb/VMT)

k = constant (lb/VMT) = 0.23 (PM_{2.5}), 1.5 (PM₁₀), 4.9 (PM)

a = 0.9 (PM_{2.5}), 0.9 (PM₁₀), 0.7 (PM)

b = 0.45 (PM_{2.5}), 0.45 (PM₁₀), 0.45 (PM)

s = surface material silt content (%) = 10

W = mean vehicle weight (tons) = 39 tons

M = surface material moisture content (%) = 0.2

VMT = (1,000,000 tons/yr / 36 tons/truckload) x (0.45 miles/truckload)

= 12,500 miles/yr

control efficiency = 70%, assuming watertruck for unpaved roads

⁴ Fugitive emissions

3. Total Emissions for Facility

Pollutant	810 hp Diesel Engine Generator (tpy)	Stone Processing Operations (tpy)	Total (tpy)
NO _x	18.19	-----	18.19
CO	4.83	-----	4.83
SO ₂	2.90	-----	2.90
PM	0.40	41.17	41.57
PM ₁₀	0.33	13.75	14.08
PM _{2.5}	0.27	2.6	2.87
VOC	0.51	-----	0.51
HAPS	2.44 E-02		2.44 E-02

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Air Quality Assessment:

Since there were no modifications proposed in this permit renewal application, an Ambient Air Quality Impact Assessment (AAQIA) was not required to be performed for the facility.

Significant Permit Conditions:

For the renewal of this temporary covered source permit, no significant permit changes were made. The renewal permit contains the following significant permit conditions:

1. Operational restriction for the 810 hp diesel engine generator not to exceed 2080 hours per any rolling twelve (12) month period. This operational restriction is required in order to comply with the state ambient air quality standard for NO_x.
2. Operational restriction for the 1500 TPH stone processing plant not to exceed 1,000,000 tons per any rolling twelve (12) month period.
3. Fuel restrictions for the 810 hp diesel engine generator. Shall be fired only on diesel fuel no. 2 with a maximum sulfur content not to exceed 0.5 percent by weight.
4. The opacity requirements from NSPS Subpart OOO of 15% was applied to the 1500 TPH primary jaw crusher and 560 TPH cone crusher.
5. The opacity requirements from NSPS Subpart OOO of 10% was applied to the 3-deck screen and from any transfer point on the radial stacker or the miscellaneous conveyors.
6. The opacity testing from NSPS Subpart OOO for the crushers, screen, radial stacker and conveyors was incorporated into the permit for compliance testing. This is to be performed within sixty (60) days of permit issuance and on an annual basis. Monthly visible emissions observations of opacity are also required.
7. Monthly and annual visible emissions observations of opacity for the 810 hp diesel engine generator were incorporated in the permit for compliance purposes.
8. Added an alternate operating scenario. The permittee may replace the diesel engine generator with a temporary replacement unit if any repair 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).
9. Corrected the capacity of the cone crusher from 560 TPH to 380 TPH and 3-deck screen from 20' x 7-1/3' to 5' x 16', respectively. Also verified the correct model and serial numbers for the equipment.

Conclusion and Recommendations:

Recommend issuing the renewal for Temporary Covered Source Permit, CSP No. 0467-01-CT, subject to the significant permit conditions shown above. The existing permit conditions and project emissions remain basically unchanged, as the facility operations have not changed. A 30-day public comment period and 45-day EPA review period are also required.

Reviewer: Darin Lum
Date: 3/05