

**PERMIT APPLICATION REVIEW
COVERED/TEMPORARY COVERED SOURCE PERMIT No. 0045-01-C/CT
Application for Minor Modification No. 0045-29**

Company: Grace Pacific Corporation

Mailing Address: P.O. Box 78
Honolulu, Hawaii 96810

Facility: Makakilo Quarry

Location: 1. 91-920 Farrington Highway
Kapolei, Hawaii 96707
2. Various Temporary Sites, State of Hawaii (Rip-Rap Plant)

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

Responsible Official: Mr. Nathan J. Obrey
Vice President of Manufacturing Operations
Grace Pacific Corporation
(808) 672-3545

Contact: Mr. Joseph Shacat
Environmental Compliance Manager
Grace Pacific Corporation
(808) 674-8383

Consultant: LFR Inc. an Arcadis Company
220 South King Street, Suite 1290
Honolulu, HI 96813

Equipment:

Proposed additional equipment:

576 TPH Rip-Rap Plant:

1. 576 TPH Lippmann Rip-Rap Plant, model no. 6224;
2. 62" x 24" Vibrating Grizzly Feeder; and
3. 203 hp Volvo Penta diesel engine, model no. TAD720GE, serial no. 5310187672;

BACKGROUND

Grace Pacific Corporation has submitted an application for a minor modification for their facility at Makakilo Quarry. The modification consists of the following:

PROPOSED

1. Addition of a 576 TPH Rip-Rap Plant with EPA Tier 2 certified 203 hp diesel engine. The rip-rap plant will be used to screen raw aggregate to reduce the amount of aggregate sent to the existing 600 TPH recycled aggregate plant. The operating hours of the rip-rap plant, as represented by the 203 hp diesel engine, will be limited to 4,380 hours in any rolling 12-month period.
2. Reduction of the operating hours of the 600 TPH recycled aggregate plant with 1,000 kW diesel engine generator. The total operating hours, as measured by the operating hours of the 1,000 kW diesel engine generator, will be reduced from 6,750 hours to 6,000 hours in any rolling 12-month period.
3. Removal of the existing 150 TPH screening plant and associated equipment.
4. Grace Pacific requests that the proposed 576 TPH Rip-Rap Plant be incorporated as a temporary equipment. Pursuant to Hawaii Administrative Rules, Section 11.60.1-81, temporary covered sources only apply to nonmajor sources. The rip-rap plant is not a major source of emissions.

There are no proposed changes for all other existing equipment in the design or operation of the facility.

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

1. Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants is applicable to the following plants because the maximum capacity for fixed and portable plants is greater than 25 tons/hour and 150 tons/hour, respectively, and commenced construction, reconstruction, or modification after August 31, 1983:

- a. Canica model nos. 125, 100S, and 95 crushers of the 400 TPH Non-Portable Plant.
- b. 600 TPH Aggregate Recycling Plant.
- c. 600 TPH Screening Plants.
- d. 576 TPH Rip-Rap Plant.

The remainder of the 400 TPH Non-Portable Plant is exempt from Subpart OOO requirements because the facilities were in operation prior to August 31, 1983.

2. Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is not applicable to the 1,000 kW diesel engine generator (manufactured 2002) and 203 hp diesel engine (manufactured 2002) because the engines were manufactured before April 1, 2006.

National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61

This source is not subject to NESHAPS as no hazardous air pollutants are emitted at significant levels and there are no NESHAPS requirements in 40 CFR Part 61.

National Emission Standards for Hazardous Air Pollutants for Source Categories (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 1,000 kW diesel engine generator and 203 hp diesel engine because the engines are classified as existing sources (constructed before June 12, 2006). An existing compression ignition (CI) stationary RICE does not have to meet the requirements of this subpart and of subpart A of this part.

Prevention of Significant Deterioration (PSD)

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.

Although the facility is considered a “major source” as defined in HAR §11-60.1-1, it is not considered a “major stationary source” as defined in §HAR 11-60.1-131. Fugitive emissions are not included in determining if this source is a major stationary source because this source does not belong to any of the 26 source categories listed under §HAR 11-60.1-131, or any other stationary source category which, as of August 7, 1980, is being regulated pursuant to Section 111 or 112 of the Clean Air Act. 40 CFR 60 Subpart OOO was not in effect as of August 7, 1980.

Compliance Assurance Monitoring (CAM), 40 CFR 64

This source is not subject to CAM since the facility does not use a control device to achieve compliance with any emission limitation or standard. 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)

This source is not subject to CERR 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.

DOH Annual Emissions Reporting

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.

Best Available Control Technology (BACT)

This source is not subject to BACT analysis because the potential to emit emissions due to the modifications (576 Rip-Rap Plant with storage piles and 203 hp Diesel Engine) are below the significant levels as shown in the table below. BACT analysis is required for new sources or significant modifications to sources that have the potential to emit or increase emissions above significant levels considering any limitations as defined in HAR, Section 11-60.1-1.

BACT		
Pollutant	Potential Emissions 576 Rip-Rap Plant (TPY)	Significant Levels (TPY)
CO	2.52	100
NO _x	4.75	40
SO ₂	1.46	40
PM	16.43	25
PM-10	7.17	15
VOC	1.02	40

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 the facility is classified as a major source.

INSIGNIFICANT ACTIVITIES / EXEMPTIONS

595 hp Diesel Engine Generator

A 595 hp diesel engine generator servicing a water pump during blasting activities was exempt from permitting requirements in a July 11, 2002 letter. The exemption assumed the diesel engine generator is operated as follows:

1. Fired on fuel oil no. 2 with a sulfur content not to exceed 0.5% by weight.
2. Used only to power the water pump, which provides dust control during blasting.
3. Activated prior to blasting and shut down immediately after blasting.
4. Used approximately 30 hours per year.

24.8 hp diesel engine

A 24.8 hp diesel engine servicing the 600 TPH screening plant is rated at 0.262 MMBtu/hour. It is an insignificant activity in accordance with HAR 11-60.1-82(f)(2) as the heat input capacity is less than one million Btu per hour.

Storage Tanks

The following storage tank is less than 40,000 gallons and is considered insignificant in accordance with HAR 11-60.1-82(f)(1):

1. 6,000 gallon fuel oil no. 2 storage tank.

ALTERNATIVE OPERATING SCENERIOS

Diesel Engine and Diesel Engine Generator

The permittee may replace each diesel engine or diesel engine generator with a temporary replacement unit of similar size with equal or lesser emissions if any repair reasonably warrants the removal of the diesel engine or 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 crushing and screening plants are equipped with water spray systems to control fugitive emissions from crushing and screening operations. A water truck will be used to control fugitive emissions from the stockpiles, yard area, and unpaved roads.

PROJECT EMISSIONS

Current emissions

Total emissions for the current facility are summarized in the table below.

Emissions for the 600 TPH Screening Plant, 150 TPH Screening Plant, and 400 TPH Non-Portable Plant referenced from review no. 0045-15 (July 15, 2005). Emissions for the 600 TPH Recycling Plant and 1,000 kW DEG referenced from review no. 0045-21 (May 23, 2006).

Current Emissions (TPY)						
	600 TPH Recycling Plant [6,750 hr/yr]	1,000 kW DEG [6,750 hr/ry]	600 TPH Screening Plant [2,080 hr/yr]	150 TPH Screening Plant [2,080 hr/yr]	400 TPH Non-Portable Plant [2,000,000 TPY]	Total
CO	-	5.53	-	-	-	5.53
NO _x	-	54.25	-	-	-	54.25
SO ₂	-	15.15	-	-	-	15.15
PM	22.96	0.84	58.91	16.85	57.33	156.89
PM-10	9.15	0.8	14.72	4.45	21.63	50.75
PM-2.5	1.79	0.75	4.34	1.31	6.38	14.57
VOC	-	1.3	-	-	-	1.3

PROPOSED

Proposed emissions

Emission calculations are attached to this review. The operating hours of the 576 TPH Rip-Rap Plant and diesel engine will be limited to 4,380 hours in any rolling 12-month period.

576 TPH Rip-Rap Plant

Emissions were based on the maximum capacity of the 576 TPH rip-rap plant. Water spray systems will be used 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.

576 TPH Rip-Rap Plant		
Pollutant	Emissions (TPY) [4,380 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	4.91	9.82
PM-10	1.65	3.30
PM-2.5	0.21	0.42

Storage Piles

Emissions were based on the maximum capacity of the 576 TPH rip-rap plant, although the actual percentage of aggregate being transferred to storage piles is 30%. A 70% control efficiency was assumed for water suppression to control fugitive dust. Emissions were based on emission factors from AP-42 Section 13.2.4 (11/06) - Aggregate Handling and Storage Piles.

Storage Piles		
Pollutant	Emissions (TPY) [4,380 hr/yr]	Emissions (TPY) [8,760 hr/yr]
PM	11.38	22.75
PM-10	5.38	10.76
PM-2.5	0.81	1.63

203 hp Volvo Penta Diesel Engine

The diesel engine is fired on fuel oil No. 2 with a maximum sulfur content of 0.5% by weight, and a maximum fuel consumption of 9.4 gallons/hour. Emissions were based on EPA Tier 2 emission standards. TOC and HAP emissions were based on emission factors from AP-42 Section 3.3 (10/96) - Gasoline and Diesel Industrial Engines. The mass balance method was used to determine SO₂ emissions.

203 hp Volvo Penta Diesel Engine			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [4,380 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	1.15	2.52	5.04
NO _x	2.17	4.75	9.50
SO ₂	0.67	1.46	2.92
PM	0.07	0.14	0.29
PM-10	0.07	0.14	0.29
PM-2.5	0.07	0.14	0.29
TOC	0.46	1.02	2.03
HAPs	0.005	0.011	0.021

PROPOSED

1,000 kW Cummins Diesel Engine Generator

The diesel engine generator is fired on fuel oil No. 2 with a maximum sulfur content of 0.5% by weight, and a maximum fuel consumption of 63.3 gallons/hour. The total operating hours will be limited to 6,000 hours in any rolling 12-month period. Emissions were based on manufacturer's data. SO₂ and HAP emissions were based on emission factors from AP-42 Section 3.4 (10/96) - Large Stationary Diesel And All Stationary Dual-fuel Engines.

1,000 kW Cummins Diesel Engine Generator			
Pollutant	Emissions (lb/hr)	Emissions (TPY) [6,000 hr/yr]	Emissions (TPY) [8,760 hr/yr]
CO	1.64	4.91	7.17
NO _x	16.07	48.21	70.39
SO ₂	4.48	13.43	19.60
PM	0.24	0.71	1.04
PM-10	0.23	0.69	1.00
PM-2.5	0.21	0.64	0.94
TOC	0.39	1.16	1.69
HAPs	0.013	0.040	0.058

Total Emissions with Modifications

Total emissions with the proposed modifications are summarized in the table below. Emissions for the 600 TPH Recycling Plant reduced by a factor of 6,000/6,750.

Proposed Emissions (TPY)							
	576 TPH Rip-Rap Plant and Storage Piles [4,380 hr/yr]	203 hp Diesel Engine [4,380 hr/yr]	600 TPH Recycling Plant [6,000 hr/yr]	1,000 kW DEG [6,000 hr/yr]	600 TPH Screening Plant [2,080 hr/yr]	400 TPH Non-Portable Plant [2,000,000 TPY]	Total
CO	-	2.52	-	4.91	-	-	7.43
NO _x	-	4.75	-	48.21	-	-	52.96
SO ₂	-	1.46	-	13.43	-	-	14.89
PM	16.29	0.14	20.41	0.71	58.91	57.33	153.79
PM-10	7.03	0.14	8.13	0.69	14.72	21.63	52.34
PM-2.5	1.02	0.14	1.59	0.64	4.34	6.38	14.11
VOC	-	1.02	-	1.16	-	-	1.18
HAPs	-	0.011	-	0.040	-	-	0.0507

Total Emissions

Total facility emissions are summarized in the table below.

Total Facility Emissions and Trigger Levels (TPY)				
Pollutant	Emissions (Limited)	BACT Significant Level	CERR Triggering Level (Type A sources / Type B sources)	DOH Level
CO	7.43	100	2,500 / 1000	250
NO _x	52.96	40	2,500 / 100	25
SO ₂	14.89	40	2,500 / 100	25
PM	153.79	25	-	25
PM-10	52.34	15	250 / 100	25
PM-2.5	14.11	-	250 / 100	-
VOC	1.18	40	250 / 100	25
HAPs	0.0507	-	-	5

AIR QUALITY ASSESSMENT

An ambient air quality impact assessment (AAQIA) was performed for the 203 hp diesel engine to demonstrate compliance with State and National ambient air quality standards. The SCREEN3 screening model was used for the analysis to determine maximum pollutant impacts.

SCREEN3 Model Parameters

1. Unit emission rate of 1 g/s.
2. Ambient temperature of 293.15 °K (68 °F).
3. Flat/simple and complex terrain impact.
4. Rural dispersion parameters.
5. Default meteorology.
6. Building downwash from Rip-Rap Plant (HxLxW = 10 feet x 25 feet x 6 feet).

Complex terrain points used:

1. 4 m height at a distance of 384m (H-1 Freeway, nearest public access point).

Emission Rates and Stack Parameters

The table below lists the emission rates and stack parameters used for the analysis.

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)
203 hp Diesel Engine	0.1449	0.2734	0.0088	0.0088	0.0844	1.8	0.083	0.5215	705.93

Results

The result of the SCREEN3 model for the maximum 1-hour concentration was 290.4 µg/m³ for the simple terrain, taken at the H-1 Freeway (nearest public access point).

The predicted concentrations assumed an annual limit of 4,380 hours/year. The table below shows the predicted ambient air quality impact of the diesel engine 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	42.1	2508	2550.1	10000	40000	25.5%
	8-hr	29.5	798	827.5	5000	10000	16.5%
NO ₂	Annual	7.9	8	15.9	70	100	22.8%
PM-10	24-hr	1.0	61	62.0	150	150	41.3%
	Annual	0.3	18	18.3	50	50	36.5%
PM-2.5	24-hr	1.0	12	13.0	-	35	37.2%
	Annual	0.3	5	5.3	-	15	35.0%
SO ₂	3-hr	22.1	23	45.1	1300	1300	3.5%
	24-hr	9.8	13	22.8	365	365	6.2%
	Annual	2.5	3	5.5	80	80	6.8%

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 were taken from Kapolei, Oahu. The PM-2.5 3-year average of the 98th percentile 24-hour background concentration was used.
3. Assume total conversion of NO_x to NO₂.

SIGNIFICANT PERMIT CONDITIONS

New significant permit conditions:

1. The total operating hours of the 576 TPH Rip-Rap Plant with 203 hp diesel engine, as represented by the total operating hours of the 203 hp diesel engine, shall not exceed 4,380 hours in any rolling 12-month period.
2. The 203 hp diesel engine shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight.
3. The total operating hours of the 600 TPH Recycled Aggregate Plant with 1,000 kW diesel engine generator, as represented by the total operating hours of the 1,000 kW diesel engine generator, shall not exceed 6,000 hours in any rolling 12-month period.
4. The operation of the 576 TPH Rip-Rap Plant covered by this temporary covered source permit shall involve at least one (1) location change during the term of this permit.
5. Remove the existing 150 TPH screening plant and associated equipment.
5. Update permit conditions for 40 CFR Part 60, Subpart OOO (updated April 28, 2009).

CONCLUSION

Actual emissions should be lower than estimated because the plants will not be operating at their maximum capacities for their permitted operating hour limits. Based on the information submitted by Grace Pacific Corporation, it is the determination of the Department of Health that the proposed project will be in compliance with the Hawaii Administrative Rules (HAR), Chapter 11-60.1, and State and Federal ambient air quality standards. Recommend issuance of the covered/temporary covered source permit subject to the incorporation of the significant permit conditions and 45-day Environmental Protection Agency review period.

Mark Saewong
November 24, 2009