

PROPOSED

Temporary Covered Source Permit Review Summary (Renewal)

Application File No.: 0381-04

Permit No.: 0381-02-CT

Applicant: TRI-L Construction, Inc.

Facility: 231.5 TPH Stone Quarrying and Processing Plant and Portable Screening Plant
#10 Manawainui Bridge
Hoolehua, Molokai
UTM Coordinates: 701400 m E, 2336850 m N

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Application Date: May 21, 2007. Received on July 9, 2007

Proposed Project:

SIC Code: 1411 (Dimension Stone)

This is application for the renewal of Temporary Covered Source Permit No. 0381-02-CT which expired on March 4, 2008. This application also includes a minor modification which proposes to replace the existing John Deere 204 HP diesel engine with a Cummins 252 HP diesel engine to operate the primary jaw crusher.

The applicant currently operates a 231.5 TPH stone quarrying and processing plant and a portable screening plant at #10 Manunawai Bridge, Hoolehua, Molokai. The applicant processes basalt rock by loading the material into the jaw crusher. A portion of the material is transported via conveyor belt to a stockpile. The remainder of the material travels on conveyor belts to the impact crusher and 3-deck screen. From the screen, material is transported to stockpiles. The portable screening plant is not connected to the stone quarrying and processing plant. No crusher is associated with the portable screening plant.

Operations are typically conducted for 8 hours per day, 5 days per week. The applicant is proposing that the 231.5 TPH portable stone processing plant with 252 HP diesel engine and the 1085 HP diesel engine generator be limited to 1,400 hours of operation per year. Monitoring of the hourly limitation will be achieved through the use of non-resetting hour meters on the 252 HP diesel engine and 1085 HP diesel engine generator.

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The application fee for the renewal of a temporary covered source permit of \$1,000.00 was processed.

Equipment Description:

Unit No.	Description	Model Number	Serial Number	Date of Manufacture	Capacity	Fuel
1	231.5 TPH Stone Quarrying and Processing Plant consisting of: Thunderbird Industries Primary Jaw Crusher	3625 JOHCJ	630	unknown	231.5 TPH	204 HP DE
	Canica Secondary Crusher	Model 85	851144-88	09/88	100 TPH	1085 HP DEG
	Hewitt Robins 3-Deck Screen	Model 6' x 16'	VT 5352	unknown		1085 HP DEG
	Various conveyors, Water spray system					
2	1085 HP Cummins Diesel Engine Generator	KTA38-G2	1900349504	08/90	1085 HP	54 gph diesel no. 2
3	252 HP Cummins Diesel Engine	6CTA8.3-G	44328972	pre-06/92	252 HP	12.2 gph diesel no. 2
4	Portable Screening Plant, including: One (1) Construction Equipment Company Roadrunner Portable Screener with 67 HP Deutz diesel engine (exempt) Various conveyors, Water spray system			unknown	270 TPH (estimate)	67 HP Deutz diesel engine

Air Pollution Controls:

Fugitive emissions of particulate matter are anticipated from the rock crushing operations, aggregate handling and storage, and vehicle traffic on unpaved roads. A water spray truck (70% control efficiency) will control fugitive dust emissions from the access road and the crushing area. In addition, water sprays (70% efficiency) will control fugitive emissions at the following transfer points of the operation:

1. At the feeder;
2. Transfer point from conveyor #9 to stockpile;
3. Transfer point from conveyor #1 to conveyor #2;
4. Transfer point from screen to conveyor #5;
5. Transfer point from conveyor #5 to stockpile;
6. Transfer point from conveyor #6 to stockpile;
7. Transfer point from conveyor #7 to stockpile;
8. Transfer point from screen to conveyor #8; and
9. At the feeder to the portable screening plant.

The 252 HP diesel engine and 1085 HP diesel engine generator are not equipped with any air pollution control equipment. Both engines use diesel no. 2 with a maximum sulfur content of 0.5% by weight.

To control emissions from the plant and the engines, the applicant is proposing an annual operating hour limitation of 1,400 hours per year.

Applicable Requirements:

Hawaii Administrative Rules (HAR)

Chapter 11-59	Ambient Air Quality Standards
Chapter 11-60.1	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
Subchapter 10	Field Citations

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

The stone quarrying and processing plant is subject to NSPS since the primary crusher (jaw crusher) was manufactured after August 31, 1983 (manuf. 2000) and its capacity is greater than 150 TPH (capacity: 231.5 tph). The plant's secondary crusher and 3-deck screen, and conveyors are also subject to NSPS, Subpart OOO. The portable screening plant is not connected to the stone quarrying and processing plant. Therefore, it does not have a primary jaw crusher and is not subject to NSPS, Subpart OOO.

Non-applicable Requirements:

Hawaii Administrative Rules (HAR)

Chapter 11-60.1	Air Pollution Control
Subchapter 7	Prevention of Significant Deterioration
Subchapter 9	Hazardous Air Pollutant Sources

Federal Requirements

- 40 CFR Part 52.21 – Prevention of Significant Deterioration of Air Quality
- 40 CFR Part 61 – National Emission Standards for Hazardous Air Pollutants (NESHAPS)
- 40 CFR Part 63 – National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)

Prevention of Significant Deterioration (PSD):

PSD review applies to new major stationary sources and major modifications to these types of sources. This source is not a major stationary source, therefore, a PSD review is not required.

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is required for new covered sources or significant modifications to covered sources that have the potential to emit or a net emissions increase above significant levels as defined in HAR §11-60.1-1. The table below shows that a BACT analysis is not required for the 252 HP diesel engine.

Pollutant	Potential Emissions - 252 HP Engine (tpy)	Significant Level	Significant?	Actual Emissions Contemporaneous Decrease - 204 HP Engine ¹ (tpy)	Net Emissions Change (tpy)
NO _x	5.16	40	no	0.77	na
SO ₂	0.34	40	no	0.05	na
CO	1.11	100	no	0.17	na
PM	0.36	25	no	0.05	na
PM ₁₀	0.36	15	no	0.05	na
VOC	0.41	40	no	0.06	na

¹ Based on 2006-2007 average emissions

Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER applicability 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 (tpy)
NO _x	≥ 100	NO _x	≥ 25	21.73
SO ₂	≥ 100	SO ₂	≥ 25	2.96
CO	≥ 1000	CO	≥ 250	5.51
PM ₁₀ /PM _{2.5}	≥ 100/100	PM/PM ₁₀	≥ 25/25	PM =74.55 PM ₁₀ = 23.57
VOC	≥ 100	VOC	≥ 25	0.88
		HAPS	≥ 5	0.0302

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 for all covered sources and from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels. Annual emissions reporting is required for this facility for in-house recordkeeping purposes because it is a covered source and facility-wide emissions of PM/PM₁₀ exceed 25 tons per year.

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 applicability 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 of activity of a stationary source that emits or has the potential to emit any air pollutant.

The potential emissions from the facility are below major source levels. Compliance Assurance Monitoring (CAM) is not applicable to this facility and only periodic monitoring is required.

Insignificant Activities:

The following insignificant activities are proposed.

Equipment Description: One (1) 1,000-gallon diesel tank
Determination: Deemed insignificant based on HAR §11-60.1-82(f)(1) which states: Any storage tank, reservoir, or other container of capacity equal to or less than forty thousand gallons storing volatile organic compounds, except those storage tanks, reservoirs, or other containers subject to any standard or other requirement pursuant to Sections 111 and 112 of the Act.

Equipment Description: 67 HP Deutz diesel engine.
Determination: The 67 HP Deutz diesel engine provides power to the portable screening plant. According to the applicant and manufacturer’s literature, the fuel input rate is 3.5 gal/hr. As shown in the calculations below, the engine has a heat input capacity of 0.480 MMBtu/hr. Fuel burning equipment with a heat input capacity less than one million BTU/hr is exempt under HAR §11-60.1-62(d)(4).
(3.5 gal/hr x 19,300 Btu/lb * 7.1 lb/gal = 0.480 MMBtu/hr)

Alternative Operating Scenarios:

No alternative operating scenarios are proposed.

Synthetic Minor Source:

A synthetic minor source is a facility that is potentially major (as defined in HAR Section 11-60.1-1), but is made non-major through federally enforceable permit conditions. This facility is a synthetic minor based on potential emissions of particulate matter and NO_x greater than “major”

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levels when the stone quarrying and processing plant is operated at the maximum capacity for 8,760 hours per year. Operating permit limits make the facility non-major.

Project Emissions:

231.4 TPH Stone Quarrying and Processing Plant and Portable Screening Plant Emissions

Emission Source	PM (tpy)	PM ₁₀ (tpy)	CO (tpy)	NO _x (tpy)	SO _x (tpy)	VOC (tpy)	HAPs (tpy)
Primary Crushing ³	0.25	0.12					
Secondary Crushing ³	0.53	0.24					
Screening ³	11.50	4.00					
Conveyors ³	5.57	2.04					
Truck Loading ³	0.08	0.04					
Truck Unloading ³	0.01	0.01					
Storage Piles ⁵	11.44	5.41					
Unpaved Roads ⁴	44.29	10.83					
252 HP Diesel Engine ¹	0.36	0.36	1.11	5.16	0.34	0.41	0.0076
1085 HP DEG ²	0.52	0.52	4.40	16.57	2.62	0.47	0.0226
TOTAL	74.55	23.57	5.51	21.73	2.96	0.88	0.0302

¹ Emissions based on AP-42, Section 3.3, Gasoline and Diesel Industrial Engines, 10/96

² Emissions based on AP-42, Section 3.4, Large Stationary Diesel and All Stationary Dual-Fuel Engines, 10/96

³ Emissions based on AP-42, Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing, 8/04

⁴ Emissions based on AP-42, Section 13.2.2, Unpaved Roads, 11/06

⁵ Emissions based on AP-42, Section 13.2.4, Aggregate Handling and Storage Piles, 11/06

Air Quality Assessment:

Ambient air quality impact assessments are generally performed on new or modified sources to analyze the maximum potential pollutant concentrations generated by a source and its effect on the ambient air. Since this an existing facility that is proposing to replace the existing 204 HP diesel engine with a 252 HP diesel engine to operate the primary crusher, an ambient air quality analysis was performed.

The table below shows the Good Engineering Practice (GEP) analysis used to identify the equipment/building, if any, having the greatest downwash. Building downwash was considered in the ambient air quality analysis because neither the 252 HP diesel engine nor the 1085 HP diesel engine generator met GEP stack height guidelines.

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GEP Analysis

Building	Hb - Height (m)	Length (m)	Width (m)	Pw - Projected Width (m) ⁽¹⁾	5*Hb (m)	5*Pw (m)	5*L (L=lesser of 5Hb & 5Pw)	Distance to stack (m)	GEP ⁽²⁾ Analysis?	GEP ⁽³⁾ Hg=Hb+1.5L (m)
252 HP Diesel Engine										
Diesel Housing	4.0	2.4	6.1	6.56	20.0	32.8	20.0	0.0	yes	10.0
Jaw Crusher	4.3	2.7	9.1	9.49	21.5	47.5	21.5	9.1	yes	10.75
Second. Crush.	4.0	1.8	1.8	2.55	20.0	12.7	12.7	12.2	yes	7.82
Screen	9.1	2.4	6.1	6.56	45.5	32.8	32.8	30.0	yes	18.93 ⁽⁶⁾
1085 HP Diesel Engine Generator										
Diesel Housing	4.0	2.4	6.1	6.56	20.0	32.8	20.0	9.1	yes	10.0
Jaw Crusher	4.3	2.7	9.1	9.49	21.5	47.5	21.5	0.0	yes	10.75
Second. Crush.	4.0	1.8	1.8	2.55	20.0	12.7	12.7	12.2	yes	7.82
Screen	9.1	2.4	6.1	6.56	45.5	32.8	32.8	30.0	yes	18.93 ⁽⁶⁾

Notes:

1. Pw is the effective building width and is equal to the hypotenuse of the length and width.
2. GEP analysis is required when there is a potential downwash effect (distance to stack is within 5L).
3. GEP analysis is performed to determine the necessary stack height. Downwash is considered if the actual stack height is lower than the necessary stack height.
4. For conservatism, the applicant measured the dimensions of the jaw crusher and engine.
5. Actual stack height of 252 HP diesel engine = 5.5 m (< necessary stack height of 18.9 m).
6. Actual stack height of the 1085 HP DEG = 5.18 m (< necessary stack height of 18.9 m).

The SCREEN3 modeling program was used by the Department of Health to predict concentration levels from the 252 HP diesel engine and the 1085 HP diesel engine generator. SCREEN3 is an EPA-recommended screening-level model that can predict building wake effects. All model calculations were obtained using the regulatory default mode. Rural land use was assumed and full meteorological conditions were used.

The applicant indicated that the facility is located in a pit with a quarry wall height of approximately 18 meters. The area surrounding the facility and pit is flat. The shortest distance from the facility to the quarry wall is 37 meters. The nearest point of public access is 100 meters from the facility. The applicant placed receptors as follows:

- Ten (10) - meter increments from a distance of 37 meters to a distance of 97 meters (height: 18 m). The placement of these receptors is conservative because they are situated at locations not accessible by the public.
- Ten (10) - meter increments from a distance of 100 meters to 200 meters (height: 18 m)

All receptors are located outside the pit, at an elevation above the stack height of the diesel engine and diesel engine generator. Therefore, the SCREEN3 modeling program was run using complex terrain.

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

Source Emission Rates and Stack Parameters for Air Modeling

Source		Stack Parameters ⁽²⁾							
Equipment	Stack No.	PM ₁₀	SO ₂	NO ₂	CO	Ht. (m)	Temp (K)	Vel. (m/s)	Diam. (m)
252 HP DE	1	0.0655	0.0611	0.9287	0.2001	5.5	767	71.948	0.1016
1085 HP DEG	2	0.0932	0.4707	2.9829	0.7923	5.18	758	64.919	0.254

SCREEN3 outputs a 24-hour concentration for complex terrain (simple and valley). Conversion factors were used to convert the 24-hour concentration to represent 1-hour, 3-hour, 8-hour, and annual estimates. The conversion factors are based on EPA and State of Hawaii (annual) scaling factors.

Results of the SCREEN3 ambient air quality modeling are shown below. The tables below show the projected emission concentrations from the 252 HP diesel engine and 1085 HP diesel engine generator, respectively. The bolded entries represent the model output concentrations. All other entries are scaled concentrations. The greatest impacts were identified at the following points:

- 252 HP Diesel Engine: Complex Simple 24-Hour Concentration of 436.5 ug/m³ at 77 meters from the source and 18 meters height.
- 1085 HP Diesel Engine Generator: Complex Valley 24-Hour Concentration of 121.5 ug/m³ at 77 meters from the source and 18 meters height and Complex Simple 24-Hour Concentration of 153.3 ug/m³ at 57 meters from the source and 18 meters height.

Emission Concentrations of 252 HP Diesel Engine

Averaging Time	Factor	Complex Valley 24-Hour (ug/m ³)	Complex Simple 24-Hour (ug/m ³)
1-Hour	1	161.28	1091.25
3-Hour	0.9	145.15	982.13
8-Hour	0.7	112.89	763.88
24-Hour	0.4	64.51	436.50
Annual	0.2	32.26	218.25

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Emission Concentrations of 1085 HP Diesel Engine Generator

Averaging Time	Factor	Complex Valley 24-Hour (ug/m ³)	Complex Simple 24-Hour (ug/m ³)
1-Hour	1	303.75	383.25
3-Hour	0.9	273.38	344.93
8-Hour	0.7	212.63	268.28
24-Hour	0.4	121.50	153.30
Annual	0.2	60.75	76.65

The highest values of the 1-hr, 3-hr, 8-hr, 24-hr, and annual concentrations were identified in the simple terrain models and were used in determining ambient air impacts. Results of the ambient air quality analysis are shown in the table below.

- Background concentrations from MECO Palaau were used to determine air quality impact.
- Ambient Ratio Method (ARM) Tier 2 was used to predict NO₂, assuming 75% NO_x to NO₂.
- The predicted source concentrations assume operation for 1,400 hours per year to ensure compliance with NAAQS and SAAQS for NO₂.

The combined effect of the maximum concentrations generated by the 252 HP diesel engine, 1085 HP diesel engine generator, and ambient background concentrations, complies with State and Federal ambient air quality standards.

Predicted Ambient Air Quality Impacts

Pollutant	Averaging Time	252 HP Predicted Source Conc. (ug/m ³) ⁽¹⁾	1085 HP Predicted Source Conc. (ug/m ³) ⁽¹⁾	Bkgrnd (ug/m ³) ⁽²⁾	Total Impact (ug/m ³)	SAAQS (ug/m ³)	NAAQS (ug/m ³)	%Standard ⁽³⁾
PM ₁₀	24-Hour	19.9478	14.2898	28	62.24	150	150	41.5
	Annual	1.5940	1.1419	13	15.74	50	50	31.5
SO ₂	3-Hour	59.9813	162.3682	18	240.35	1300	1300	18.5
	24-Hour	26.6583	72.1636	5	103.82	365	365	28.4
	Annual	2.1302	5.7665	1	8.90	80	80	11.1
NO ₂ ⁽⁴⁾	Annual	24.2957	27.4052	3	54.70	70	100	78.1
CO	1-Hour	218.3227	303.6589	3816	4337.98	10000	40000	43.4
	8-Hour	152.8259	212.5612	1386	1751.39	5000	10000	35.0

Notes:

1. As proposed by applicant, operations are limited to 1,400 hours per year. Annual concentrations are multiplied by 1400/8760 to reflect this reduction.
2. MECO Palaau concentrations were used as background data.
3. Indicates percentage of SAAQS since they are the same or more stringent than the NAAQS.
4. Ambient Ratio Method (ARM) Tier 2 was used to predict NO₂, assuming 75% NO_x to NO₂.

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Significant Permit Conditions:

Significant permit conditions included the replacement of the 204 HP diesel engine with a 252 HP diesel engine.

Conclusions and Recommendations:

Issuance of the renewal of Temporary Covered Source Permit No. 0381-02-CT is recommended based on the review of information provided by the applicant and subject to the significant permit conditions noted above, a 30-day public comment period and a 45-day EPA review period.

Reviewer: DL
Date: 8/2008