

**PERMIT APPLICATION REVIEW
TEMPORARY COVERED SOURCE PERMIT (CSP) NO. 0562-01-CT
Application for Renewal No. 0562-03
Application for Modification No. 0562-04**

Applicant: CTS Earthmoving, Inc.
Facility: Various crushing and screening plants
Location: Various Temporary Sites, State of Hawaii
Mailing Address: P.O. Box 470
Holualoa, Hawaii 96725

Existing equipment: The crushing and screening plants consist of the following:

- a. 1,500 TPH Aggregate Machinery, Inc. Thunderbird II jaw crushing plant, serial no. 2217-03, with 215 - 1,500 TPH Cedarapids jaw crusher, model no. 3054, serial no. 52169 (30" x 54" jaw size);
- b. 1,500 TPH Aggregate Machinery, Inc. Thunderbird II jaw crushing plant, serial no. 2495-06, with 215 - 1,500 TPH Cedarapids jaw crusher, model no. 3054, serial no. 54169 (30" x 54" jaw size);
- c. 560 TPH Cedarapids cone crushing plant, model no. MVP 380, serial no. 10172 with Thunderbird II three-deck screen, model no. 6163.7-SH-O, serial no. 50393 (6' x 16');
- d. Various conveyors servicing the crushing and screening plants;
- e. Water spray systems servicing the crushing and screening plants;
- f. 300 hp Caterpillar diesel engine, model no. C-9, serial no. CLJ04382 driving the 1500 TPH jaw crushing plant, serial no. 2217-03;
- g. 425 hp Caterpillar diesel engine, model no. C-12, serial no. BDL 01886 driving the 1,500 TPH jaw crushing plant, serial no. 2495-06; and
- h. 890 hp Caterpillar diesel engine generator, model no. 3412, serial no. 81Z23751 providing power to various crushing and screening operations.

Proposed modification(s):

- a. Add One (1) 560 TPH Cedarapids Cone Crushing Plant Model MVP 380, S/N 29598-08, with 6' x 20' screen S/N 54956, and
- b. Add One (1) 814 HP CATERPILLAR Diesel Engine Generator, model 3412CDITA, S/N BPG02516

Responsible

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1. Background

- 1.1 CTS Earthmoving, Inc. has applied for a permit renewal and modification to add a 560 TPH Cone crushing plant with built-in screen and an 814 hp diesel engine generator to its facility. Existing equipment for the permit renewal includes two 1,500 TPH jaw crushing plants with 300 hp and 425 hp diesel engines, a 560 TPH cone crushing plant with built-in screen, and an 890 hp diesel engine generator that provides power to various crushing and screening operations. There are no increases in emissions or changes from the existing equipment pertaining to the permit renewal. As such, the emissions and modeling assessments that were calculated in review 0562-02 are still applicable and referenced throughout this review. New emissions were calculated pertaining to the proposed modification of additional equipment and added to the overall facility output.

- 1.2 Existing plants have a 1,850 hour per year operating limit. The applicant proposes to continue the existing operational limitation such that the operating hours for each plant and diesel engine shall be restricted to no more than 1,850 hours per 12-month rolling period. Additionally, the applicant states that the permittee shall not operate more than one (1) jaw crusher, one (1) cone crusher with screen, and one (1) diesel engine generator concurrently at the same location. The standard industrial classification code (SICC) for this facility is 1429 (Crushed and Broken Stone, Not Elsewhere Classified).

2. Applicable Requirements

- 2.1 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
 - Subchapter 8 - Standards of Performance for Stationary Sources
 - 11-60.1-161(27) Standards of Performance for Non-metallic Mineral Processing Plants
 - Subchapter 10 – Field Citations

- 2.2 40 Code of Federal Regulations (CFR) Part 60 – New Source Performance Standards (NSPS), Subpart OOO, Standards of Performance Standards of Performance for Non-metallic Mineral Processing Plants is applicable to the this facility because the plant equipment was manufactured after to1983 and the primary crushers for the facility all have capacities above 150 TPH.

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- 2.3 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to 40 CFR Part 63 - National Emissions Standards for Hazardous Air Pollutants (NESHAPS) including subpart ZZZZ or Maximum Achievable Control Technology (MACT) requirements under 40 CFR, Parts 61 and 63.
- 2.4 The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emission units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 CFR, 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 greater than the major source level; and (5) not otherwise be exempt from CAM. CAM is not applicable because this facility is not a major source.
- 2.5 Prevention of Significant Deterioration (PSD) review applies to new major stationary sources and major modifications to these types of sources. The facility is not a major source for any single air pollutant. As such, PSD review is not required.
- 2.6 Annual emissions reporting will be required because this plant is a covered source.
- 2.7 The consolidate emissions reporting rule (CERR) is not applicable because emissions from the facility do not exceed reporting levels pursuant to 40 CFR 51, Subpart A (see table below).

CERR APPLICABILITY			
Pollutant	Facility Emissions (1,850 hr/yr with water sprays and water truck)	CERR Triggering Levels (TPY)	
		1 year cycle (type A sources)	3 year cycle (type B sources)
PM ₁₀	35.5	≥ 250	≥ 100
SO ₂	7.95	≥ 2,500	≥ 100
NO _x	38.46	≥ 2,500	≥ 100
VOC	1.77	≥ 250	≥ 100
CO	6.8	≥ 2,500	≥ 1,000

- 2.8 A best available control technology (BACT) analysis is not required for this permit modification to add a 560 TPH crushing plant with screen and 814 hp diesel engine because potential additional emissions from the plant do not exceed significant levels as defined in HAR, Section 11- 60.1 for particulate matter (see table below). *Note: The addition of the Cedarapids MVP 380 cone crusher with screen although not BACT applicable IS equipped with water spray bars which is accepted as the best available control technology for a crushing and screening plant.*

BACT APPLICABILITY		
Pollutant	Emissions (TPY) ^a	Significant Level (TPY)
SO ₂	2.73	40
NO _x	16.96	40
CO	4.51	100
VOC	0.477	40
PM	9.29	25
PM ₁₀	3.76	15
PM _{2.5}	1.91	10

^aBased on emissions from the proposed modification to the permit operated at 1,850 hr/yr with a water spray system to control fugitive dust.

- 2.9 The facility is a synthetic minor source because operational limits and controls for the plant restrict air pollutants below major source thresholds.
- 2.10 The proposed 814 HP diesel engine generator was manufactured before April 1, 2006 and is not subject to 40 CFR part 60 subpart IIII, Standards of Performance for Stationary Combustion Ignition Internal Combustion Engines.

3. Insignificant Activities

- 3.1 Insignificant activities identified by the application are listed below:
 - a. 235 gallon fuel storage tank servicing the 300 hp diesel engine is an insignificant activity in accordance with HAR §11-60.1-82(f)(1).
 - b. 235 gallon fuel storage tank servicing the 425 hp diesel engine generator is an insignificant activity in accordance with HAR §11-60.1-82(f)(1).
 - c. 500 gallon fuel storage tank servicing the 890 hp diesel engine is an insignificant activity in accordance with HAR §11-60.1-82(f)(1).

4. Alternate Operating Scenarios

- 4.1
 - a. The permit allows replacement of any diesel engine with another unit of same size or smaller than the primary unit with equal or lower emissions.
 - b. The permittee may run either jaw crusher with either cone crusher or either diesel engine generator. Records will be kept of which piece of equipment is operated with which other piece of equipment, as well as of dates and of locations.

5. Air Pollution Controls

- 5.1 The crushing and screening plants are equipped with a water spray system with water spray bars at:
 - a. Each feeder for the primary jaw crushers;
 - b. Each primary jaw crusher;

- c . Conveyor transfer below cone crusher; and
- d. All screen to conveyor transfer sites.

5.2 A water spray truck will be used to control fugitive dust at each work site for the crushing and screening plants.

6. Project Emissions

6.1 Emissions of NO_x, CO, VOC, PM, PM₁₀, and PM_{2.5} were based on emissions data from manufacturer’s specifications. HAP emissions were based on emission factors from AP-42, Section 3.4 (10/96), Large Diesel Industrial Engines. A mass balance calculation was used to determine SO₂ emissions based on the maximum allowable fuel sulfur content of 0.5% by weight and a 41.82 gallon per hour maximum fuel consumption at 100% load. An operation limit of 1,850 hours per year was assumed for the diesel engine. Emission estimates are shown in Enclosure (1) and summarized below.

DIESEL ENGINE				
Pollutant	Engine Emission Rate		Engine Emissions (TPY)	
	814 hp engine		814 hp engine	814 hp engine
	lb/hr	g/s	1,850 hours	8,760 hours
SO ₂	2.946	0.371	2.725	12.902
NO _x	18.334	2.310	16.959	80.302
CO	4.870	0.614	4.505	21.330
VOC	0.516	0.065	0.477	2.259
PM	0.399	0.050	0.369	1.749
PM ₁₀	0.328	0.041	0.304	1.438
PM _{2.5}	0.274	0.035	0.254	1.202
HAPs			0.0231	0.110

6.2 Particulate emissions from the crushing plant were based on emission factors from AP-42, Section 11.19.2 (8/04), Crushed Stone Processing and Pulverized Mineral Processing. The controlled emission factors were used for crushing, screening, and conveyor transfer points. It was assumed that 51% PM was PM₁₀ and 15% PM was PM_{2.5} based on information from AP-42, Appendix B.2.2. Uncontrolled emission factors were used for truck loading and unloading operations. A 70% control efficiency for water sprays was applied to determine emissions using the uncontrolled emission factors. A 1,850 hr/yr operation limit was also applied to determine emissions. The rated capacity of the equipment was used to determine maximum potential emissions. Emissions from the 1,500 TPH crushing plant are shown in Enclosure (2) and summarized below.

560 TPH CONE CRUSHER WITH SCREEN		
Pollutant	Emissions (TPY)	Total Plant Emissions (TPY)
	1,850 hr/yr with water sprays	8,760 hr/yr with water sprays
PM	8.92	42.24
PM ₁₀	3.45	16.34
PM _{2.5}	1.66	7.84

6.3 Total yearly emissions from operating the crushing and screening plant are listed below as follows:

TOTAL EMISSIONS				
Pollutant	Potential Emissions (TPY) (1,850 hr/yr with water sprays and water truck)			Potential Emissions (TPY) (8,760 hr/yr with water sprays and water truck)
	New Equipment ^b	Existing Equipment ^a	Entire Facility ^c	
SO ₂	2.75	5.2	7.95	37.64
NO _x	16.96	21.5	38.46	182.11
CO	4.505	2.3	6.8	32.20
VOC	0.477	1.3	1.77	8.38
PM	8.92	98.9	107.82	510.53
PM ₁₀	3.45	32.1	35.55	168.32
Total HAPs	0.012	0.045	0.057	0.27

^a Based on the worst case scenario of existing conditions that was conducted in 0562-02 review. The calculated emissions for the existing facility equipment done in review 0562-02 are still applicable and consistent.

^b Based on the proposed modification adding an additional 560 TPH Cone crusher with screen and 814 hp diesel engine to the permit to provide the option to interchange machinery for a single facility or to operate another single facility at a different location.

^c Represents the total facility emissions including the renewed existing equipment and the new proposed modifications.

7. Air Quality Assessment

7.1 Results from the AAQIA conducted for the existing 300 hp, 890 hp, and 425 hp diesel engines can be referenced in reviews 0562-01 & 0562-02 and were not recalculated.

7.2 The applicant's consultant performed an ambient air quality impact analysis (AAQIA) for new the 814 hp diesel engine generator. An EPA SCREEN3 model was used for the analysis. Assumptions for the model included:

- a. Application of flat terrain in an approximate 50 meter (164 ft) radius around the source;
- b. Simple elevated terrain parameters at the following heights/distances in meters 1/41, 2/81, 3/123, 4/164;
- c. Complex terrain parameters at the following heights/distances in meters 12/500, 24/1000, 37/1400, 48/1900, 61/2300, 73/2700, 85/3000;
- d. Rural dispersion parameters;
- e. Wake affects from a structure that is 14' x 9.8' x 36' in dimension;
- f. Default meteorology;
- g. EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hour, 8-hour, and 24-hour

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concentrations, respectively;

- h. State of Hawaii scaling factor of 0.2 for the annual concentrations; and
- i. Annual operating limit of 1,850 hours per year.

7.3 The following background concentrations were used for the assessment:

- a. PM₁₀ – collected in 2004 from the Hilo air quality monitoring station (air monitoring station that is closest to Kona with PM₁₀ data). No particulate data was collect on the island of Hawaii in 2005.
- b. NO_x - collected in 2005 from the Kapolei air quality monitoring station (air monitoring station with NO_x data that is most conservative of current data from another island).
- c. 1-hour CO – collected in 2005 from the Honolulu air quality monitoring station (air monitoring station that is most conservative of current data from another island).
- d. 8-hour CO – collected in 2005 from the University air quality monitoring station (air monitoring station that is most conservative of current data from another island).
- e. SO₂ – collected in 2004 from the Kona air quality monitoring station. No SO₂ data was collected on the island of Hawaii in 2005.

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

SOURCE	STACK	EMISSION RATES (g/s)				STACK PARAMETERS			
		NO _x	SO ₂	CO	PM ₁₀	Height (m)	Temp. °K	Dia. (m)	Flow Rate (m/sec)
814 hp Engine	1	1.2512	0.374	0.362	0.041	6.5	778.65	0.203	68.866

7.5 The table below shows the normalized modeling results and conversion factors. The bold entries are the model outputs.

Simple Terrain			Complex Terrain Valley	
Averaging Period	Factor	Normalized Output (ug/m ³ per g/s)	Factor	Normalized Output (ug/m ³ per g/s)
		814 hp engine		814 hp engine
1-hour	N/A	389.3	0.25	8.25
3-hour	0.9	350.4	0.9	29.68
8-hour	0.7	272.5	0.7	23.09
24-hour	0.4	155.72	N/A	32.98
Annual	0.2	77.86	0.2	6.60

7.6 Results from the AAQIA of the 814 hp diesel engine, shown in the table below, indicate compliance with the ambient air quality standards.

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PREDICTED AMBIENT AIR QUALITY IMPACTS						
AIR POLLUTANT	AVERAGING TIME	IMPACT (ug/m ³)	BACKGROUND (ug/m ³)	TOTAL IMPACT (ug/m ³)	AIR STANDARD	PERCENT STANDARD
		814 hp engine				
SO ₂	3 –Hour	127	119	250	1,300	19.2
	24 – Hour	58	47	105	365	28.8
	Annual ^a	6	11.4	17.4	80	22
NO ₂	Annual ^{a,b}	16	9.4	24.4	70	35.5
CO	1 – Hour	141	4351	4492	10,000	44.9
	8 – Hour	98	1169	1267	5,000	25.4
PM ₁₀	24 – Hour	6	29	35	150	23.6
	Annual ^a	0.7	15	15.7	50	31.4

^aAnnual concentration reduced by a factor of 1,850/8,760 to account for diesel engine hour limitation.

^bTotal impact reduced by 25% to account for partial conversion of NO_x to NO₂. Reduced impact = impact (0.75)

8. Significant Permit Conditions

8.1 The 1,500 TPH jaw crushing plant with 425 hp diesel engine shall not exceed 1,850 hours in any rolling twelve (12) month period.

8.2 The 1,500 TPH jaw crushing plant with 300 hp diesel engine shall not exceed 1,850 hours in any rolling twelve (12) month period.

8.3 Each 890 hp and 814 hp diesel engine generator servicing the crushing and screening plants shall not exceed 1,850 hours in any rolling twelve (12) month period.

Reason for 8.1: The applicant has proposed a maximum 1,850 hours per year operation limit for equipment at this facility. Equipment operating hours are dependant on operation of the diesel engines and diesel engine generator powering the various crushing and screening units. The hour limits enable the facility to operate below major source thresholds when all equipment is located at one site. The limits are also necessary for compliance with the ambient air quality standards for operating the various diesel engines providing power for the facility.

8.4 Incorporate minimum stack height requirements for the diesel engines and diesel engine generator.

Reason for 8.4: The AAQIA was based on stack heights reported by applicant.

8.5: 40 CFR, Part 60, Subpart OOO provisions are applicable to the jaw crusher and conveyors built after 1983.

Reason for 8.5: Incorporated into the permit based on applicability to federal standards as indicated in Paragraph 2.2.

8.6 The permittee shall not operate more than one (1) jaw crusher, one (1) cone crusher with screen, and one (1) diesel engine generator concurrently at the same location.

9. Conclusion and Recommendation:

Actual emissions from this facility should be lower than estimated. Maximum potential emissions were based on worst-case conditions assuming maximum rated capacity of the diesel engines and stone processing plant equipment. Actual crushing capacity will vary depending on product size and the type of material, but will likely be much lower than the maximum rated capacity. Calculations were based on 1,850 hours per year operation. Recommend issuance of the temporary covered source permit modification and renewal subject to the significant permit conditions.

Ryan Go
4/30/2009