

PROPOSED

**TEMPORARY COVERED SOURCE APPLICATION REVIEW
Permit Number: 0581-01-CT**

Applicant: **Isemoto Contracting Company, Ltd.**
Application No. 0581-01 New Application

Facility: **640 tph Extec Mega-Bite Tracked Jaw Crusher
with 300 hp (224 kW) Deutz Diesel Engine (DE)**

Located At: Various Locations, State of Hawaii

Initial Location: Vicinity of Waikoloa Road, Waikoloa, Hawaii 96738

UTM-Coordinates: Zone 5, 202,120 m E, 2,204,670 m N (NAD 83)

Mailing Address: 74-5039 B Queen Kaahumanu Highway
Kailua-Kona, Hawaii 96740

Phone: (808) 329-8051

Standard Industrial Classification Code: 1429 Crushed and Broken Stone

Responsible Official: Jerry Egami Phone: (808) 329-8051

Title: Senior Vice President

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Title: same as above Shop Supervisor

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Equipment Description and Specifications

<u>Equipment</u>	<u>Description</u>
1. Jaw Crusher	640 tph Extec, Mega-Bite tracked model, identification number 5737, manufactured date unknown. The Extec Megabite is a tracked jaw crusher, 1 m-wide side conveyor, and dust suppression with 3 sets of water spray nozzles connected to the central manifold.
2. Diesel Engine	300 hp Caterpillar, model BF6 M1 015, identification number 042 290 50RY, fuel oil no. 2, less than 0.5% sulfur by weight, at maximum consumption of 14.8 gallons per hour. The diesel engine (DE) is on the Extec jaw crusher.

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Rebar and other metal are removed by a built-in magnet. The raw material consists of basalt and concrete. The raw material is dumped into the grizzly feeder by a front end loader. From the grizzly feeder the basalt and concrete is directed into the jaw crusher. Undersized material is transported by conveyor belt no. 1 to stockpile no. 1 beside the crusher. The remaining material goes through the jaw crusher and onto conveyor belt no. 2 and stockpile no. 2.

Applicable Requirements

Hawaii Administrative Rules (HAR) Title 11

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

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

40 Code of Federal Regulations (CFR) Part 60-Standards of Performance for
New Stationary Sources

Subpart A-General Provisions

Subpart OOO-Standards of Performance for Nonmetallic Mineral
Processing Plants

Standards of Performance for New Stationary Sources [also known as New Source Performance Standards (NSPS)] is applicable. A portable crushed stone plant, that commences construction, reconstruction, or modification after August 31, 1983, with a capacity of 150 tons per hour or greater, is subject to the requirements of Title 40 Code of Federal Regulations (CFR) Part 60 Subpart OOO Standards of Performance for Nonmetallic Mineral Processing Plants. Fixed sand and stone plants with capacities of 25 tph or greater are subject to the same provisions. The maximum capacity of this jaw crusher is greater than 150 tph. All conditions as specified in Subpart OOO apply to this facility.

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Synthetic Minor refers to sources which have the potential to emit greater than 100 ton per year of a regulated air pollutant, or 10 tons per hazardous air pollutant, or 25 tons per year for any combination of HAPs, but where limits are proposed to reduce emissions below these levels. A synthetic minor source is a potentially major source but is made a minor source through federally enforceable permit conditions, for example, limiting the facility's hours of operation, limiting the facility's fuel consumption, or the plant's material production throughput. Pollution control devices are considered as part of the facility. Based on the maximum potential emissions at 8,760 hours per year, and the limited hours of operation, this jaw crusher is a synthetic minor.

Non-Applicable Requirements

Compliance Assurance Monitoring (CAM) Part 64 of the CFR for large emission or major sources that rely on air pollution control devices to achieve compliance. 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 apply to all of the below:

1. Be located at a major stationary source per Title V of the Clean Air Act Amendments of 1990? No.
2. Be subject to federally enforceable applicable requirements. Yes.
3. Have pre-control device potential emissions that exceed applicable major source thresholds. Yes.
4. Be fitted with an "active" air pollution control device; No.
5. Not be subject to certain regulations that specifically exempt it from CAM. Yes.

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant. This jaw crusher does not have any active pollution control devices except for their water spray system to minimize their fugitive emissions. Water sprinklers are not pollution control devices applicable to CAM. CAM is not applicable because this facility does not meet all of the above requirements.

Consolidated Emission Reporting Rule (CERR) as defined by 40 CFR Part 51, Subpart A-Emissions Inventory Reporting Requirements. CERR is established to simplify reporting, offer options for data collection and exchange, and unify reporting dates for various categories of criteria pollutant emission inventory, for example, point, area, onroad, and nonroad mobile, and biogenics.

This rule applies to state and local agencies. CERR is based on facility-wide emissions for each air pollutant that emits at or exceeds the CERR and DOH triggering levels are shown in the table below.

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Pollutant	1-640 tph Stone Crushing Plant (tpy)	300 hp Diesel Engine (tpy)	CERR Trigger Levels Annual Inventory Type A/B Point Source (tpy)	In-house Total Facility Trigger Levels (tpy)
NO _x	-	10.73	2,500 / 100	25
SO _x	-	0.71	2,500 / 100	25
CO	-	2.31	2,500 / 1000	250
PM ₁₀	12.1	0.75	250 / 100	25
PM _{2.5}	4.1 ³	0.68 ²	250 / 100	25
VOC	-	0.88	250 / 100	25
NH ₃ ¹	N/A	N/A	250 / 100	
Pb ¹	N/A	N/A	5	0.6

¹ NH₃ (ammonia) and Pb (lead) are not available.

² PM_{2.5} value, 90% of PM, referenced from AP-42; Appendix B.2; Table B.2.2; Category 1; Process: Stationary Internal Combustion Engines;

Material: Gasoline and Diesel Fuel; For PM_{2.5} = (TSP 0.75) x (0.90) = 0.68.

³ PM_{2.5} value, 15% of PM, referenced from AP-42; Appendix B.2; Table B.2.2; Category 3; Process: Mechanically Generated;

Material: Aggregate, Unprocessed Ores; For PM_{2.5} = (TSP 27.2) x (0.15) = 4.08

This facility does not have any individual emission points that emits at the CERR triggering levels. In-house reporting is not required. However, because this is a covered source, annual emissions reporting is required.

National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAPS): Pursuant to section 112 of the Clean Air Act (CAA), 40 CFR Part 61, §61.01(a) lists the substances which have been designated as HAPs. Under this part, NESHAPS is not applicable because there are no listed standards for crushers. Very little HAPs (0.02 tons per year) are being emitted from the fuel oil no. 2 burning diesel engine.

Prevention of Significant Deterioration (PSD): 40 CFR Part 52, §52.21, PSD review applies to any new major stationary sources and major modifications to these types of sources as listed and defined in HAR, Title 11, Chapter 11-60.1, Subchapter 7. This facility is not a major stationary source for any single air pollutant. Annual emissions with water sprays are less than 30 ton/year. Hence, PSD review is not required.

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Best Available Control Technology (BACT) analysis applies to new and modified sources if the net increase in pollutant emissions exceed "significant levels" as defined in HAR §11-60.1-1 (considering any limitations, enforceable by the Department of Health, on the source to emit a pollutant). Also, for listed categories in CFR Parts 60, 61, and 63, BACT determination includes all fugitive emissions, except vehicle traffic emissions, in calculating potential emissions for major source determination.

BACT is an emissions limitation based on the maximum degree of reduction for each pollutant. On a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, if achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the pollutant, the applicant eliminates or supports step-by-step pollution control options, beginning at the top of a list of best available pollution control technology, taking into account:

- (1) Energy;
- (2) Environmental; and
- (3) Economic impacts and other costs, if achievable through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the pollutant.

See Project Emissions below, for emission calculations. The calculated potential maximum emissions for the Extec Mega-Bite tracked jaw crusher, does not exceed "significant level", or 40 tons for particulate matter at 10 micrometers diameter and less. Therefore, a Best Available Control Technology analysis is not required for this facility.

Title 40 Code of Federal Regulations Part 63-National Emission Standards for Hazardous Air Pollutants for Source Categories Maximum Achievable Control Technology (MACT) means the maximum degree of reduction in emissions of the hazardous air pollutants (HAPs), taking into consideration the cost of achieving such emission reduction and any non-air quality health and environmental impacts and energy requirements, that is deemed achievable.

This source is not subject to MACT, because there are no listed standards for jaw crushers.

Insignificant Activities/Exemptions

There were no insignificant activities or equipment exemptions in the application.

Alternative Operating Scenarios

There were no proposed alternate operating scenarios in the application.

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Project Emissions

The pollutant from the Extec Mega-Bite tracked jaw crusher is fugitive dust (PM). Emissions from the diesel fuel fired point source diesel engine are various criteria and hazardous air pollutants.

The criteria pollutants are total suspended particulates (TSP), particulate matter less 10 micrometers (PM₁₀), sulfur oxide (SO_x), carbon monoxide (CO), and total organic compounds (TOC).

Potential emission calculations are based on the maximum capacity of the primary crusher which in this case is 640 tph. AP-42, 5th edition, Table 11.19.2-2 Emission Factors for Crushed Stone Processing Operations, August 2004, were used to calculate the fugitive dust emissions from the Extec Mega-bite tracked jaw crusher. Because there were no primary and secondary crushing emission factors (EF), the tertiary crushing emission factor was used to predict crushing emissions. In this Extec crusher, there is just one crusher. The "fines crushing" and "fines screening" are not applicable to this permittee's operations.

AP-42 Table 3.3-1 Emission Factors For Uncontrolled Diesel Industrial Engines, and Table 3.3-2 Speciated Organic Compound Emission Factors For Uncontrolled Diesel Engines, October 1996, in units of pounds of pollutant per million Btu, were used to estimate the emissions from the diesel engine. Emissions were calculated with a maximum fuel consumption rate of 14.8 gallons per hour (gph), high heat value of 19,300 Btu/pound (Btu/lb), and 7.1 pounds per gallon of fuel oil no 2, for the DE.

19,300 Btu/lb multiplied by 7.1 lb/gal equals 137,030 MMBtu/gal, and 70% efficiency was used at nozzle locations and throughout the processing line.

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UNCONTROLLED ESTIMATED EMISSIONS¹ OF CRITERIA AND HAZARDOUS AIR POLLUTANTS 640 tph EXTEC MEGA-BITE TRACKED JAW CRUSHER w/ 300 hp DEUTZ DIESEL ENGINE								
Pollutant and Description	300 hp Diesel Engine		Fugitive Dust Stone Processing		300 hp Diesel Engine		Fugitive Dust Stone Processing	
	2400 hr/yr		2400 hr/yr		8760 hr/yr		8760 hr/yr	
	lbs/hr	tons/yr	TSP ton/yr	PM ₁₀ tons/yr	lbs/hr	tons/yr	TSP tons/yr	PM ₁₀ tons/yr
TSP	0.629	0.75			0.629	2.75		
PM ₁₀	0.629	0.75			0.629	2.75		
CO	1.926	2.31			1.926	8.44		
NO _x	8.942	10.73			8.942	39.17		
SO _x	0.588	0.71			0.588	2.58		
TOC	0.730	0.88			0.730	3.20		
Benzene	0.002	0.0023			0.002	0.0082		
Toluene	0.001	0.001			0.001	0.0036		
Xylenes	0.001	0.0007			0.001	0.0025		
Propylene	0.005	0.0063			0.005	0.0229		
1,3 Butadiene	0.0001	0.0001			0.0001	0.0003		
Formaldehyde	0.002	0.0029			0.002	0.0105		
Acetaldehyde	0.002	0.0019			0.002	0.0068		
Acrolein	0.0002	0.0002			0.0002	0.0008		
Naphthalene	0.0002	0.0002			0.0002	0.0007		
PAH ²	0.0003	0.0004			0.0003	0.0015		
Pri Crusher			4.15	1.84			15.14	6.73
Sec Crusher			-	-			-	-
Tert Crusher			-	-			-	-
Fines Crushing			-	-			-	-

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Screening			19.20	6.68			70.08	24.39
Fines Screen			-	-			-	-
Conveyor Transfer Pts			9.22 4 pts	3.38 4 pts			33.64 4 pts	12.33 4 pts
Wet Drilling			-	-			-	-
Truck Unload Fragmented			0.01	0.01			0.04	0.04
Truck Unload Conveyor			0.08	0.08			0.28	0.28
Unpaved Road ³			36.17	18.1 ³			132	67.0
Storage Piles ³			21.71	10.27			79.25	37.49
TOTALS		HAPs 0.02	TSP 90.5	PM ₁₀ 40.4		HAPs 0.06	TSP 330	PM ₁₀ 148

¹ See individual calc sheets in file folder for calculations and specific data.

² PAH, polycyclic aromatic hydrocarbons

³ Potential emissions of unpaved roads and storage piles were taken from the application.

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CONTROLLED ESTIMATED EMISSIONS¹ OF CRITERIA AIR POLLUTANTS 640 tph EXTEC MEGA-BITE TRACKED JAW CRUSHER				
Description	Fugitive Dust Stone Processing			
	2400 hr/yr		8760 hr/yr	
	TSP ton/yr	PM ₁₀ tons/yr	TSP tons/yr	PM ₁₀ tons/yr
Primary Crusher	1.24	0.55	4.54	2.02
Secondary Crusher	-	-	-	-
Tertiary Crusher	-	-	-	-
Fines Crushing	-	-	-	-
Screening	5.76	2.00	21.02	7.32
Fines Screening	-	-	-	-
Conveyor Transfer Points 4	2.76	1.01	10.09	3.70
Wet Drilling Unfragmented	-	-	-	-
Truck Unloading Fragmented	0.00	0.00	0.01	0.01
Truck Unloading Conveyor	0.02	0.02	0.08	0.08
Unpaved Roads ²	10.85	5.4	39.6	19.7
Storage Piles ²	6.51	3.08	23.76	11.24
Totals	TSP 27.2	PM ₁₀ 12.1	TSP 99.1	PM ₁₀ 44.1

¹ See individual calc sheets in file folder for calculations and specific data.

² Potential emissions of unpaved roads and storage piles were taken from the application.

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Air Pollution Controls

The 640 tph Extec Mega-Bite tracked jaw crusher has 3 sets of dust suppression water spray nozzles connected to the central manifold. A water truck is on site and is used to minimize fugitive dust on access roads and other areas around the plant.

The 300 hp (225 kW) diesel engine (DE) will be fired exclusively on fuel oil no. 2 with less than or equal to 0.5% sulfur content by weight to minimize sulfur dioxide emissions.

Air Quality Assessment

Ambient air means the general outdoor atmosphere to which the public has access. The numerical ambient air standards limit the time-average concentration of specified pollutants dispersed or suspended in the ambient air of the State, and these standards do not in any manner authorize the significant deterioration of existing air quality in any portion of the State.

An ambient air quality impact analysis is performed for new or modified sources. The ambient air quality standards seek to protect public health and welfare and to prevent the significant deterioration of air quality.

The Department of Health air modeling guidance generally exempts an applicant from performing an ambient air quality impact analysis for:

- (1) existing sources with no proposed modifications,
- (2) insignificant activities,
- (3) fugitive emission sources (for example, storage tanks, storage piles, and pipe leaks), and
- (4) intermittent operating noncombustion sources.

This plant is a new source, therefore, the diesel engine's stack emissions of pollutant concentrations needs to be assessed to verify compliance with the ambient air quality standards.

AP-42 Table 3.3-1 Emission Factors For Uncontrolled Diesel Industrial Engines less than 600 hp, October 1996, were used to estimate the emissions from the diesel engine for nitrogen oxide (NO_x), carbon monoxide (CO), sulfur oxide (SO_x), particulate matter with less than 10 micrometers (PM₁₀), and total organic compounds (TOC). The emission factors in units of pounds of pollutant per million Btu of fuel oil were converted to pounds per hour and then to grams per second for modeling.

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CRITERIA POLLUTANT EMISSION RATE					
	NO_x	CO	SO_x	PM₁₀	TOC
pound/hour	8.942	1.926	0.588	0.629	0.730
gram/second	1.127	0.243	0.0741	0.0792	0.092

The following table shows the results of the SCREEN3 modeling, consistent with 40 CFR Part 51, Appendix W, simple terrain, with the dimensions of the jaw crusher as downwash wake structure. Screen3 default meteorology was used to predict ambient air impacts.

The highest concentration per volume collected amongst three monitoring stations, was selected as background concentration for this air quality assessment. The three monitoring stations are (1) Kona, from the SLAMS and NAMS 2004 Annual Summary Hawaii Air Quality Data booklet, (2) Huehue Monitoring Station, Keahole, February '99 - May 2000, and (3) Kakahiaka Monitoring Station, Keahole, February - May 2000.

The applicant proposed to limit to 2,400 hours per rolling twelve (12) month period.

DEG STACK DATA					
Stack Ht	Stack Dir	Stack Id	Exit V	Flow Rate Q	Stack Gas Exit Tmp
11' -6" (3.5m)	up	6" (0.1524m)	191 ft/s (58.213 m/s)	2250 ft ³ /min (1.0619 m ³ /s)	950 °F✱ (783 °K)

Flow check: $Q = va$; ---> $58.213 \times (\pi/4) \times (0.1524)^2 = 1.0619 \text{ m}^3/\text{s}$

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COMPLIANCE WITH AMBIENT AIR QUALITY STANDARDS						
640 TPH Portable Jaw Crusher and 300 hp Diesel Engine						
AIR POLLUTANT	AVG'G TIME	PREDICTED AIR QUALITY IMPACTS (µg/m³)			HAWAII AIR STANDARD (µg/m³)	PERCENT OF STD (%)
		DEG	BACKGROUND¹	TOTAL		
Carbon Monoxide CO	1-hour	488	542	1030	10,000	10
	8-hour	341	321	662	5,000	13
Nitrogen Dioxide NO ₂	Annual ²	47	9	56	70	80
Particulate Matter PM ₁₀	24-hour	64	27	91	150	61
	Annual	9	13	22	50	44
Sulfur Dioxide SO ₂	3-hour	134	55	189	1,300	15
	24-hour	60	21	81	365	22
	Annual	8	20	28	80	35

¹ Carbon Monoxide (CO), 1-hour from Huehue, May 2000; 8-hour from Kakahiaka, April 2000.
 NO_x as NO₂ (nitrogen dioxide), from 2004 Annual Summary Hawaii Air Quality Data, Kapolei, December 2004, near the entrance to Campbell Industrial Park,
 Particulate Matter (PM₁₀), 24-hour and annual from Kakahiaka, April 2000
 Sulfur Dioxide (SO₂), 3-hr, and 24-hr, from 2004 Annual Summary Hawaii Air Quality Data, and annual estimated from Konawaena High School, Kealahou

² Ozone Limiting Method employed to NO_x annual. Ozone (O₃), All-Hours, from 8-hour, Sand Island, 34 micrograms per cubic meter, 2004 Annual Summary Hawaii Air Quality Data

Other Issues

None.

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Significant Permit Conditions

1. The jaw crusher is subject to Title 40 Code of Federal Regulations (CFR) Part 60- Standards of Performance for New Stationary Sources, Subpart OOO.
2. A non-resetting hour meter shall be installed on the 300 hp diesel engine for the recording of the 2400 limiting hours of operation of the Extec Mega-Bite tracked jaw crusher.
3. The Extec Mega-Bite tracked jaw crusher shall be equipped with a water spray system to reduce emissions of fugitive dust. This water spray system shall be utilized as necessary to minimize fugitive dust while the plant is in operation.

Conclusion And Recommendation

Based on the information submitted by the applicant, it is the determination of the Hawaii Department of Health that the proposed project will be in compliance with 40 CFR Part 60, Subpart A, Subpart OOO, and the Hawaii Administrative Rules (HAR), Chapter 11-60.1, and will not cause or contribute to a violation of any State or National ambient air quality standards.

Conservatism was applied to the estimated emissions from this facility with maximum potential emission calculations at 640 tons per hour. The actual crushing throughput will be much lower (basalt) than the assumed maximum design capacity used in the AP-42 emission calculations (limestone). There will be times when the 640 tph jaw crusher will not be operating at maximum capacity. The Hawaii DOH intends to issue this CSP No. 0581-01-CT, subject to permit conditions, public comments, and EPA review.

ngs
november 2005