

# PROPOSED

## COVERED SOURCE PERMIT (CSP) APPLICATION REVIEW

**Permit Number: 0073-02-C**

{Supersedes NSP Nos. 0073-01-NT for Plant B}

Applicant: Bryson's Cinders, Inc.  
Application No.: 0073-02

Facility: 323 tph Stone Quarrying and Processing Plant  
w/ 865 hp (645 kW) Diesel Engine Generator (DEG)  
Located At: Kapoho Quarry, Kapoho, Hawaii

UTM-Coordinates: Zone 5, 306,670 m E, 2,159,000 m N TMK 1-4-2: 18  
Standard Industrial Classification Code: 1429 Crushed and Broken Stone

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### Equipment Description and Specifications.

{Note: \*Item within curly brackets are exempt from permit itemization}

<u>Equipment</u>	<u>Description</u>
{*loader	front end, max cap = unk cy/scoop;}
1. jaw crusher	primary, Minyu model MS3042, serial no. 030, maximum capacity (max cap) 323 tph, manufactured Jul 10, '88, fuel type: electric;
2. triple roll crusher with screen	secondary, Pioneer model 50-VE-Duplex Plant serial no. 50-VE-263, max cap unknown, 4-deck screen size 5' x 14', fuel type: electric, manufactured date unknown;

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3. various conveyors
6. 10 spray nozzles      water spray. Water is supplied by city water;
7. generator      diesel engine, 865 hp (645 kW) Caterpillar model D398 (arrangement # 3N1127), serial no. 66B7862, fuel: no. 2 diesel oil w/ less than 0.5% sulfur content, fuel consumption 47.6 gal/hr;

Note: The above is the basic crushing set up. The water spray system will be in full operation at all times during any crushing operation (except for rainy days or other situations where fugitive dust is controlled). At no time will emissions be greater than the above given set up.

### Existing Facility/Background Setting.

CSP No. 0073-02-C is for a portable stone quarrying and processing plant that intends to stay stationary at the Kapoho Quarry, Kapoho, Hawaii. This permit, when issued, will supersede Noncovered Source Permit (NSP) No. 0073-01-NT1, which was restricted to 142 tons per hour (tph), 1446 hours per year (hr/yr). This same stone processing plant will be relabeled to 323 tph based on the manufacturer's rated capacity, and increased to 2080 hours per year. The hours of operation increase allows a greater comfort zone for operations and by definition, triggers a modification to the existing plant. An analysis must be made to determine the increase in emissions.

The proposed increase in hours of operation has the following effect on emissions.

Pollutant	Current Potential Emissions (tpy)	Proposed Modification Potential Emissions (tpy)	Net Emission Increase (tpy)	Significant Emission Levels (tpy)
CO	4.10	5.89	1.79	100
NO <sub>x</sub>	15.42	22.18	6.76	40
SO <sub>2</sub>	2.43	3.50	1.07	40
PM / PM <sub>10</sub>	13.51 / 6.44	16.79 / 8.00	3.28 / 1.56	25 / 15
VOC	0.43	0.62	0.19	40

See Bryson's Cinders, Inc. file folder page "Source Information" for itemized calcs.

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The front end loader loads the raw material, usually basalt rock, directly into the jaw crusher. From the jaw crusher, the rocks are sent to a triple-roll crusher with a four-deck screen (for gradation). Then, by various conveyors the sorted stones from the screen are transported to stockpiles, or back to the jaw crusher, or the triple-roll crusher for repeat crushing until the designated sizes are achieved.

Electrical power for this facility is supplied by a 845 hp (645 kW) diesel engine generator (DEG). The operating schedule is 40 hours per week, 2,080 hours per year.

### 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

§11-60.1-39 Storage of Volatile Organic Compounds

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

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Compliance Assurance Monitoring (CAM): Part 64 of the CFR applies to large emission (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:

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 (i.e., emission limit or standard)? no;
3. be fitted with an “active” air pollution control device to achieve compliance? no;
4. have precontrol device potential emissions that exceed applicable major source thresholds? no;
5. not be subject to certain regulations that specifically exempt device from CAM? no; and
6. did not complete permit application by April 20, '98?

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant. This source does not exceed 100 tpy of PM and is not a major source. This stone processing plant does not have any active pollution control devices except for the water spray system to minimize their fugitive emissions. Water sprinklers are not pollution control devices applicable to CAM. CAM is not applicable.

Compliance Data System (CDS): 40 CFR Part 51 Subpart Q, Air Quality Data Reporting, states that CDS is applicable to all major point sources (i.e., sources which emit greater than 200 ton/year for PM<sub>10</sub>, SO<sub>x</sub>, NO<sub>x</sub>, or VOC [any one pollutant]; 2,000 ton/year of CO; and 5 ton/year of lead), and in Hawaii, CDS is applicable to all covered sources. CDS is applicable to this plant.

Consolidated Emission Reporting Rule (CERR): 40 CFR Part 51, Subpart A-Emissions Inventory Reporting Requirements. Published in the Federal Register on June 10, 2002 (FR Volume 67, Number 111, pp 39602-39616). Established to simplify reporting, offer options for data collection and exchange, and unify reporting dates for various categories of criteria pollutant emission inventory (i.e., point, area, onroad and nonroad mobile, and biogenics).

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CERR is based on the emissions of each air pollutant that emits at the CERR triggering levels as shown in the table below:

Pollutant	Source Estimated Emissions (tpy)	CERR Trigger Levels Annual Inventory Type A Point Sources (tpy)	In-house Total Facility Trigger Levels (tpy)
CO	0.7	2500	250
NH <sub>3</sub> *		250	N/A
NO <sub>x</sub>	22.2	2500	25
PM <sub>2.5</sub> *		250	25
PM <sub>10</sub>	27.2	250	25
SO <sub>x</sub>	3.5	2500	25
VOC	0.6	250	25
Pb	N/A	N/A	25

\* Reporting requirements for PM<sub>2.5</sub> and NH<sub>3</sub> are delayed. See §51.30 (e) of the rule.

This facility does not have emission points that emits at the CERR 1-year or 3-year (triannual) triggering levels. Annual emission estimates are less than 250 tpy. CERR not applicable. In-house reporting will be required (PM<sub>10</sub> >25 tpy).

Standards of Performance for New Stationary Sources [also known as New Source Performance Standards (NSPS)]: 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 Part 60 Subpart OOO Standards of Performance for Nonmetallic Mineral Processing Plants. Fixed sand and stone plants with capacities of 25 tpy or greater are subject to the same provisions. The maximum capacity of the initial crusher(s) at this Stone Quarrying and Processing Plant is greater than 150 tpy. All conditions as specified in Subpart OOO apply to this facility.

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 lists the substances which have been designated as HAPs. The second list, §61.01(b), presents other substances which should be considered for serious health effects from exposure. 40 CFR Part 63 lists subparts of source categories for which stone processing is not included. This plant is not subject to NESHAPS.

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Prevention of Significant Deterioration (PSD): PSD review applies to new major stationary sources and major modifications to these types of sources. This facility is not a major stationary source as defined in HAR Title 11, Chapter 60.1, Subchapter 7 and 40 CFR Part 52, §52.21, for any single air pollutant. Calcs at 8,760 hours per year of maximum capacity operation without the water spray show that the facility is a potential major source. But actual annual emissions are less than 27 ton/year. Hence, PSD review is not required.

Synthetic Minor: Refers to sources which have the potential to emit greater than 100 tons per year of a regulated air pollutant, but where limits are proposed to reduce emissions below 100 tons per year. (Pollution control devices are a part of the facility.) A synthetic minor source is a potentially major source but is made a noncovered source or a non major covered source through federally enforceable permit conditions (e.g., limiting the facility's hours of operation, limiting the facility's production rate, or employing air pollution control devices). Based on the maximum potential of 8,760 hours per year (max emissions at 113 tph for TSP), and the limited hours of operation, this stone crushing plant is a synthetic minor.

BACT Requirements: 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). BACT is an emissions limitation based on the maximum degree of reduction for each pollutant, on a case-by-case basis, 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.

The applicant eliminates or supports step-by-step pollution control options.

This facility is an existing source with no proposed modifications. Water spray nozzles are designated as one type of BACT for rock crushing. Therefore, a Best Available Control Technology analysis is not required for this facility.

MACT Requirements: Maximum Achievable Control Technology (MACT) means the maximum degree of reduction in emissions of the hazardous air pollutants (HAPs), on a case-by-case basis, 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 as the facility is not a major point or area source of HAPs, referenced to Title 40 Code of Federal Regulations Part 63-National Emission Standards for Hazardous Air Pollutants for Source Categories.

### Insignificant Activities/Exemptions

1. 1-fuel tank (300 gal, portable) per HAR§11.60.1-82(f)(1)
2. front end loader (exempt from Subpart OOO. HAR covers fugitive emissions).

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### Alternative Operating Scenarios

None. If the generator breaks down, the plant shuts down.

### Project Emissions

Pollutants from the "area" stone processing facilities are particulate matter (PM) fugitive dust. Emissions from the diesel fuel fed "point" source diesel engine generator are various criteria and hazardous air pollutants. Although the applicant may use the two and a half (2½) inch closed stroke setting for the Cedarapids primary crusher at a rating listed at 142 tph, the current procedure based on EPA guidelines is to set maximum potential emission calcs on the maximum capacity of the primary crusher which in this case is 323 tph with the maximum 7-7/8 (seven and seven-eighths) inch closed stroke setting.

AP-42 5<sup>th</sup> edition, Table 11.19.2-2 Emission Factors for Crushed Stone Processing Operations (1/95) was used to calculate the fugitive dust emissions for the stone processing plant. The tertiary crushing emission factor (EF) was used to predict secondary crushing emissions because there was no secondary crushing EF. The tertiary (third) crusher is not presently in this processing line-up, but the emissions were included, to account for recycled stones, and as a future possibility. The "fines crushing" and "fines screening" are seldom applicable to this permittee's operations but the calcs were included as a contingency estimate to ensure conservative emission calculations for future options.

Table 3.4-1 Gaseous Emission Factors For Large Stationary Diesel and all Stationary Dual-Fuel Engines; Table 3.4-3 Speciated Organic Compound Emission Factors For Large Uncontrolled Stationary Diesel Engines; and 3.4-4 PAH Emission Factors For Large Uncontrolled Stationary Diesel Engines (10/96) were used to estimate the emissions from the 865 hp diesel engine generator. Emissions were calculated with a maximum fuel consumption rate of 47.6 gal per hour (gph) for the DEG.

The Department did emission calcs and after comparison, posted the higher values between the DOH and the applicant's consultant's emission values.

<b>ESTIMATED EMISSIONS<sup>1</sup> OF CRITERIA AND HAZARDOUS AIR POLLUTANTS 323 tph Stone Processing Plant w/ 865 hp (645kW) DEG</b>						
<b>Pollutant</b>	<b>865 hp Diesel Engine Generator</b>		<b>Fugitive Dust (TSP) Stone Processing</b>		<b>∑HAPs</b>	<b>∑TSP &amp; Criteria Pollutants</b>
	<b>lbs/hr</b>	<b>tons/yr</b>		<b>tons/yr</b>	<b>tons/yr</b>	<b>tons/yr</b>
TSP	0.66	0.69				0.69
CO	5.66	5.89				5.89
NO <sub>x</sub>	21.33	22.18				22.18
SO <sub>x</sub>	3.37	3.50				3.50
TOC	0.60	0.62				0.62

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Benzene	0.0052	0.0054			0.0054	
Toluene	0.0018	0.0019			0.0019	
Xylenes	0.00125	0.0013			0.0013	
Propylene	0.018	0.019			0.019	
Formaldehyde	0.0005	0.0005			0.0005	
Acetaldehyde	0.0002	0.0002			0.0002	
Acrolein	0.00005	0.00005			0.00005	
Naphthalene	0.0009	0.0009			0.0009	
PAH <sup>2</sup>	0.001	0.001			-	
Pri Crusher			-	0.42		0.42
Sec Crusher			-	0.51		0.51
Tert Crusher			-	0.51		0.51
Fines Crushing			-	1.53		1.53
Screening			-	3.17		3.17
Fines Screen			-	7.22		7.22
Conveyor Transfer Pts			-	2.96 10 pts		2.96
Wet Drilling			-	0.3		0.3
Truck Unload			-	0.01		0.01
Truck Load			-	0.07		0.07
Unpaved Road			-	7.12		7.12
Storage Piles			-	2.87		2.87
Σ		HAPs 0.03	-	28.3	0.03	TSP 29.0

<sup>1</sup> Based on 2,080 hrs/yr of operation.

Stone processing fugitive particulate emissions lessened with 70% efficiency water spray pollution control.

<sup>2</sup> PAH, polycyclic aromatic hydrocarbons

Emission factors are from AP-42, fifth edition, Jan. '95, along with section updates. See individual calc sheets in file folder and applicant's application for specific data.

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### Air Pollution Controls

To control the fugitive dust at transfer points, a water spray system has been installed. The efficiency of the water spray system is considered to be 70 - 95% (AP-42, 11.19.1.2, 11/95). For emission calculations, 70% efficiency was used at nozzle locations and throughout the processing line. If no permanent water supply is available, water will be trucked in with a water tank.

Based on the application submittal, ten (10) water spray locations are set for the nozzles. Water spray nozzle (WSN)1 & 2 are located after the jaw crusher on conveyor 1. WSN-3 is located at the end of conveyor 1 and above the beginning of conveyor 2. WSN 4-8 are at the triple roll crusher. WSN-9 at transfer point from roll crusher to conveyor no. 3. And WSN-10 at transfer points from conveyor no. 5 to stockpile.

Stockpiles and unpaved roads will be controlled by water sprayed via a water truck or water hose.

The 4-deck screen presents different outputs. The finer aggregates fall through the bottom screen. The small stones fall through the third. The mid size aggregates falls through the second screen. Stones too large to fall through the first screen are conveyed back to the jaw crusher.

The 865 hp (645 kW) diesel engine generator (DEG) 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, but 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 (e.g., storage tanks, storage piles, pipe leaks, etc.), and
- (4) intermittent operating noncombustion sources.

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The applicant's stone processing plant falls under (1) above, therefore, the diesel engine generator's pollutant concentrations need not be assessed to verify compliance with the ambient air quality standards because it was previously done.

The Department compared its previous ambient air assessment with the consultant's ambient air assessment and used the larger more conservative values. Most values came from the consultant's calculations, except for ozone, which came from the previous NSP application review/technical report.

Limiting concentrations specified for a calendar year or a calendar quarter shall not be exceeded. Limited concentrations specified for one-hour, three-hour, eight-hour, and twenty-four-hour periods shall not be exceeded more than once in a calendar year. The following table shows the results of the SCREEN3 modeling, with the jaw crusher as downwash structure. Existing air quality (background) data was obtained from the Puna Monitoring Station, 1993.

This plant shall be limited to 2,080 hours per rolling twelve (12) month period.

<b>DEG STACK DATA</b>					
stack ht m [ft]	stack dir	stack id m [ft]	exit v m/s [ft/s]	q flow rate m <sup>3</sup> /s [ft <sup>3</sup> /min]	stack gas exit tmp °K (°C) [°F]
7.62 [25]	up	0.1524[0.5]	127.02 [155.5]	2.317 [4910]	811( 538) [1000]

<b>COMPLIANCE WITH AMBIENT AIR QUALITY STANDARDS (AAQS)</b>							
Bryson's Cinders, Inc. 323 TPH Stone Quarrying/Processing Plant and 865 hp (645 kW) diesel engine generator							
AIR POLLUTANT	AVG'G TIME	PREDICTED AIR QUALITY IMPACTS (µg/m <sup>3</sup> )				AIR STANDARD HAWAII/NAT'L (µg/m <sup>3</sup> )	PERCENT OF STD (%)
		DEG		BCKGRD*	TOTAL		
Carbon Monoxide CO	1-hour	49		741	790	10,000/40,000	7.9
	8-hour	34.3		381	415	5,000/10,000	8.3
Nitrogen Dioxide NO <sub>2</sub>	1-hour	-		--	--	--	--
	Annual	8.8		2	10.8	70/100	0.2
Particulate Matter PM <sub>10</sub>	1-hour	--	--	--	--	--	--
	24-hour	2.3		32	34.3	150/150	0.2
	Annual	0.3		14	14.3	50/50	0.3
Ozone O <sub>3</sub>	1-hour	.		91		100/235	
	8-hour	.		64		157/157	

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Sulfur Dioxide SO <sub>2</sub>	1-hour	--		--	--	--	--
	3-hour	26.3		588	614.3	1,300/--	0.5
	24-hour	11.7		119	130.7	365/365	0.4
	Annual	1.4		6	7.4	80/80	0.1
Lead Pb	Calendar	-				1.5/1.5	--
	Quarter	-					
Hydrogen Sulfide H <sub>2</sub> S	1-hour	-		8		35/-*	-

\* Background from Puna-errata, \HAWA\_101.AQ\95.237\1993

H<sub>2</sub>S background from Lava Tree State Park, Puna, Hawaii, SLAMS & NAMS '99-'01.

Other Issues: None.

### Significant Permit Conditions

1. 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 865 hp (645 kW) diesel engine generator to represent the total hours of operation of the Stone Quarrying and Processing Plant.
3. The operating hours of the Stone Quarrying and Processing Plant shall not exceed 2,080 hours in any rolling twelve (12) month period.
4. The plant shall be equipped with a wet spray system to reduce emissions of fugitive dust. This water spray system shall be utilized as necessary while the plant is in operation (exception: when it's raining).

### Conclusion And Recommendation.

Based on the information submitted by M. Sonomura Contracting Company, Inc., and Bryson's Cinders, Inc., it is the determination of the Hawaii Department of Health that the existing 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. The actual crushing throughput will be much lower (basalt at about 150 tph) than the assumed maximum design capacity used in the emission calculations (limestone at 323 tph). Also, at this time the facility's typical annual hours of operation for stone crushing are less than the annual hourly limitation of 2,080 hours. At no time will emissions be greater than the described equipment layout.

The Hawaii DOH intends to issue a Covered Source Permit to Bryson's Cinders, Inc., subject to permit conditions, public comments, and EPA review.

Glenn Nagamine

Sept. 4, 2003

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