

**PERMIT APPLICATION REVIEW  
Significant Modification to Covered Source Permit (CSP) No. 0603-01-CT**

**Application File No.:** 0603-02

**Applicant:** E.M. Rivera & Sons, Inc.

**Facility:** 730 & 505 TPH Portable Crushing Plants

**SIC Code:** 1429 (stone processing)

**Current Location:** Waikoloa Self Storage on Waikoloa Road, TMK (3) 6-8-0212:33

**UTM Coordinates:** 813,045 m East and 2,177,867 m North

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**I. Background**

E.M. Rivera & Sons, Inc. (E.M. Rivera) submitted an application for a significant modification to its existing 505 TPH portable crushing plant in Kailua-Kona on the island of Hawaii. The application and \$500 filing fee were received by the Department of Health (DOH) on 1/10/07 and 2/23/07, respectively.

**Proposed Modification**

The application proposes to add a 730 TPH crushing plant, consisting of a 730 TPH primary jaw crusher and 503 HP diesel engine (DE), purchased from West Oahu Aggregates Company, Inc. and currently permitted under CSP 0041-01-CT, issued on 4/8/05.

The application also proposes to limit operation of each of the two crushing plants (730 TPH and existing 505 TPH) to 2,080 hours per year, and to allow concurrent operation of the two plants as long as they are operated at different locations.

**II. Equipment Description**

Table 1 provides equipment information on the two portable crushing plants.

<b>Table 1: Facility Equipment</b>					
<b>Description</b>	<b>Manufacturer</b>	<b>Fuel Feed (gal/hr)</b>	<b>Model</b>	<b>Serial No.</b>	<b>Manuf. Date</b>
730 TPH crusher	Pioneer	n/a	4248	4248-96	1994
503 HP DE	Caterpillar	26.2	3408	67U-16687	1994
505 TPH crusher	Terex/Cedarapids	n/a	Cobratrack 1100	53224	2005
300 HP DE	Cummins	14.75	QSL-9	46426239	2005

**III. Air Pollution Controls**

The facility will continue to use water sprays to control fugitive dust emissions.

**IV. Applicable Requirements**

1. Hawaii Administrative Rules (HAR), Title 11
  - Chapter 59, Ambient Air Quality Standards
  - 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 & Noncovered Sources, & 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 10 - Field Citations
2. PSD Requirements  
 PSD requirements do not apply because this facility is not considered a major stationary source and is not proposing any modifications to trigger a major modification as defined in 40 CFR 52.21 and HAR Title 11, Chapter 60.1, Subchapter 7.

3. NSPS Requirements

Subparts A and OOO apply. Subpart A provides general provisions. *Subpart OOO - Standards of Performance for Non-Metallic Mineral Processing Plants* provides for portable crushed stone plants with capacities greater than 150 TPH which commence construction, reconstruction, or modification after August 31, 1983. Both the new 730 and existing 505 TPH portable crushers meet the size and date criteria and are therefore subject to Subpart OOO.

*Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)* does not apply to the new 505 HP and existing 300 HP DEs because both DEs were manufactured before April 1, 2006 and were not modified or reconstructed after July 11, 2005.

4. NESHAP Requirements

These requirements do not apply because no standard covering the facility's operation or equipment has been promulgated under 40 CFR 61.

5. MACT Requirements

These requirements do not apply because this facility is not a major source of hazardous air pollutants and does not belong to a source category or subcategory for which a standard has been promulgated under 40 CFR 63.

6. BACT Requirements

A BACT review is required for new or modified sources which result in a net emissions increase that is "significant," as defined in HAR §11-60.1-1. Table 2 indicates that the proposed modification will result in a significant increase in PM emissions. The facility proposes to use water sprays to control fugitive PM emissions.

<b>Table 2: Emissions &amp; Triggering Levels (TPY)</b>				
<b>Pollutant</b>	<b>Emis. Increase</b>	<b>Total Emis.</b>	<b>Significant Level</b>	<b>CERR - Type B</b>
CO	4	5	100	1000
NOx	16	19	40	100
PM	56	94	25	N/A
PM-10	16	27	15	100
PM-2.5	3	4	-	100
SOx	2	3	40	100
VOC	1	2	40	100

7. CAM Requirements (40 CFR 64)

The purpose of Compliance Assurance Monitoring (CAM) is to provide 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. Since this facility is not a major source and does not meet all five criteria, CAM does not apply.

8. CER Requirements

Consolidated Emissions Reporting (CER) requirements apply if emissions from the facility equal or exceed levels provided in 40 CFR 51, Subpart A, Appendix A shown in Table 6. CER requirements do not apply because the facility's emissions are below the CER threshold levels.

9. Major Source Determination

A major source, as defined in HAR 11-60.1-1, emits or has the potential to emit any hazardous air pollutant in the aggregate of 10 tpy, 25 tpy or more of any combination of HAPs, or 100 tpy of any pollutant. This facility is not a major source since potential emissions, considering operational limits and controls, are below these levels.

10. Synthetic Minor Determination

A synthetic minor 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 a synthetic minor because without operational limits, PM, and PM-10 emissions exceed the major source level.

**V. Insignificant Activities / Exemptions**

Table 3: Insignificant Activities		
Quantity	Description	HAR Section Ref.
1	500 gallon tank storing fuel oil no. 2.	11-60.1-82(f)(1)

**VI. Alternate Operating Scenario**

If either of the two DEs (505 HP or 300 HP) powering the two crushers becomes inoperable or in need of repair, the applicant requests temporary replacement with a DE, of the same or smaller horsepower capacity generating equal or lesser emissions, until the original DEG is repaired and functioning properly.

**VII. Project Emissions**

Operation of the two crushers, aggregate handling and storage, and travel on unpaved roads result in fugitive PM emissions, while operation of the two diesel engines result in emissions of criteria pollutants.

The following tables show emissions from the two crushing plants based on continuous operation of 8,760 hr/yr (columns labeled "Cont.") and on limited operation of 2,080 hr/yr (columns labeled "Ltd."). Table 4 shows emissions from the 730 TPH plant; Table 5 shows emissions from the existing 505 TPH plant; and Table 6 shows total facility emissions.

**PROPOSED**

<b>Table 4: 730 TPH Crushing Plant Emissions (TPY)</b>										
Pollutant	730 TPH Crusher		503 HP		Agg. Handling		Unpaved Roads		Total	
	Cont.	Ltd.	Cont.	Ltd.	Cont.	Ltd.	Cont.	Ltd.	Cont.	Ltd.
CO			14.9	3.5					14.9	3.5
NOx			69.3	16.5					69.3	16.5
PM	5.7	1.4	5.3	1.3	27.2	6.5	197.3	46.8	235.5	55.9
PM-10	2.4	0.6	4.9	1.2	12.9	3.1	48.0	11.4	68.1	16.2
PM-2.5	0.5	0.1	4.9	1.2	1.9	0.5	4.8	1.1	12.1	2.9
SO2			8.1	1.9					8.1	1.9
VOC/TOC			5.5	1.3					5.5	1.3
Total HAPs			0.10	0.02					0.10	0.02

<b>Table 5: 505 TPH Crushing Plant Emissions (TPY)</b>										
Pollutant	505 TPH Crusher		300 HP		Agg. Handling		Unpaved Roads		Total	
	Cont.	Ltd.	Cont.	Ltd.	Cont.	Ltd.	Cont.	Ltd.	Cont.	Ltd.
CO			4.1	1.0					4.1	1.0
NOx			12.3	2.9					12.3	2.9
PM	3.6	0.9	0.4	0.1	18.8	4.5	136.5	32.4	159.3	37.8
PM-10	1.5	0.4	0.3	0.1	8.9	2.1	33.2	7.9	44.0	10.4
PM-2.5	0.3	0.1	0.3	0.1	1.3	0.3	3.3	0.8	5.3	1.3
SO2			4.6	1.1					4.6	1.1
VOC/TOC			1.6	0.4					1.6	0.4
Total HAPs			0.03	0.01					0.03	0.01

<b>Table 6: Total Facility Emissions (TPY)</b>						
Pollutant	730 TPH Plant		505 TPH Plant		Facility Total	
	Cont.	Ltd.	Cont.	Ltd.	Cont.	Ltd.
CO	15	4	4	1	19	5
NOx	69	16	12	3	82	19
PM	236	56	159	38	395	94
PM-10	68	16	44	10	112	27
PM-2.5	12	3	5	1	17	4
SO2	8	2	5	1	13	3
VOC/TOC	6	1	2	0	7	2
Total HAPs	0.10	0.02	0.03	0.01	0.13	0.03

**VIII. Air Quality Assessment**

An Ambient Air Quality Impact Assessment (assessment) is generally performed for new or modified sources. An assessment was performed for the 503 HP DE based on the following assumptions:

- Screen3 model.
- Operating limit of 2,080 hr/yr.
- Stack parameters as shown in Table 7 for the 503 HP DE.
- Simple and complex terrain.
- Rural area.
- Default meteorology.
- Critical downwash structure is 4 m high, 9 m long, 2.5 m wide (13'H, 30'L, 8.2'W).
- Ambient temperature of 298 K (76 F).
- 1 gm/sec of pollutant.
- Regulatory default cavity.
- EPA scaling factors of 0.9, 0.7, 0.4, and state scaling factor of 0.2 for the 3-hr, 8-hr, 24-hr, and annual concentrations, respectively.

<b>Table 7: Stack Parameters &amp; Emission Rates</b>		
<b>Parameter</b>	<b>503 HP DE</b>	<b>300 HP DE</b>
Height	19.7' = 6.0 m	12' = 3.66 m
Diameter	6.23 " = .159 m	5" = .127 m
Exhaust velocity (m/s)	69.5	55.11
Exhaust temperature (F)	950	939
Exhaust gas flow (m3/s)	1.38	0.698
CO emission rate (g/sec)	0.430	0.118
NOx emission rate (g/sec)	1.994	0.354
PM-10 emission rate (g/sec)	0.140	0.010
SO2 emission rate (g/sec)	0.232	0.131

Note: 300 HP DE data from 0603-01 application review, pg 9 is shown for information only.

Results shown in Table 8 indicate compliance with federal and state air quality standards. The maximum concentration of 1374 ug/m3 was predicted to occur at a distance of 56 meters from the source.

<b>Table 8: Ambient Air Quality Assessment Results</b>											
<b>Pol.</b>	<b>Avg. Time</b>	<b>Emis. (g/sec)</b>	<b>Time Factor</b>	<b>Oper. Limit Factor</b>	<b>Pred. Conc. (ug/m3)</b>	<b>Adjust NO2 by OLM</b>	<b>Bkgrd. Conc. (ug/m3)</b>	<b>Total Impact (ug/m3)</b>	<b>SAAQs (ug/m3)</b>	<b>NAAQs (ug/m3)</b>	<b>Percent SAAQs</b>
CO	1 hr	0.430	1.0	1.00	590		1710	2300	10000	40000	23%
CO	8 hr	0.430	0.7	1.00	413		1055	1468	5000	10000	29%
NO2	annual	1.994	0.2	0.24	130	46	9	55	70	100	78%
PM10	24 hr	0.140	0.4	1.00	77		53	130	150	150	87%
PM10	annual	0.140	0.2	0.24	9		15	24	50	50	48%
SO2	3 hr	0.232	0.9	1.00	287		64	351	1300	-	27%
SO2	24 hr	0.232	0.4	1.00	128		21	149	365	365	41%
SO2	annual	0.232	0.2	0.24	15		2	17	80	80	21%

**Notes:**

1. The Screen3 maximum predicted concentration is 1374 ug/m3 located 56 meters from the source.
2. NO2 concentration based on ozone limiting method.  $0.1 \times 130 + 34 \times 46 / 48 = 45.6$  ug/m3.
3. Annual concentrations are adjusted by the operating limit = 2,080 / 8760.
4. Background concentration levels are the highest recorded levels from the 2005 Kapolei station data.

**IX. Significant Permit Conditions**

1. The 730 and 505 TPH portable crushing plants, and associated conveyors are subject to NSPS Subparts A and OOO requirements.

Purpose: The above federal standards apply to portable crushed stone plants with capacities greater than 150 TPH which began construction after August 31, 1983.

2. The 730 and 505 TPH crushing plants may operate a maximum of 2,080 hours per rolling 12-month period.

Purpose: Emission calculations and air quality assessment based on this condition, proposed by the applicant.

3. The 730 and 505 TPH crushing plants may operate concurrently, provided that the two plants do not operate at the same location.

Purpose: Air quality assessment based on this condition, proposed by the applicant.

4. The stack height of the 503 HP DE shall be constructed and maintained at a minimum of six meters (19 feet, 8 inches) above ground.

Purpose: This DE was originally permitted under CSP 0041 with a stack height of 4.72 meters. (Reference: Review of Application 0041-01, 8/9/00, page 13.)

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5. Both the 503 and 300 HP DEs shall only be fired on fuel oil no. 2 with maximum sulfur content not to exceed 0.5% by weight.

Purpose: Emission calculations based on this condition, proposed by the applicant.

### **X. Conclusion**

E.M. Rivera proposes to add a 730 TPH crusher with a 503 HP DE to its existing facility consisting of a 505 TPH crusher with 300 HP DE. The applicant proposes to limit operation of each of the two crushing plants to 2,080 hours per year, and to allow concurrent operation of the two plants, as long as they are operated at different locations.

Issuance of an amended covered source permit is recommended based on review of information provided by the applicant and subject to significant permit conditions and EPA review.

April Matsumura  
July 3, 2007