



**NOTICE OF CONSTRUCTION  
FINAL DETERMINATION to APPROVE  
GENERAL ROCK CRUSHING PLANT**  
Olympic Region Clean Air Agency

<b>Issued to:</b>	<b>&lt;Name&gt;</b>	<b>Cnty:</b>	<b>&lt;##&gt;</b>
<b>Location:</b>	<b>&lt;Address&gt;</b>	<b>Srcce:</b>	<b>&lt;####&gt;</b>
<b>Application #:</b>	<b>&lt;App #&gt;</b>	<b>RC:</b>	<b>&lt;RC#&gt;</b>
<b>Prepared on:</b>	<b>&lt;Date&gt;</b>	<b>File:</b>	<b>&lt;####&gt;</b>

**1. Summary**

**<Name>** seeks approval through a Notice of Construction (NOC, aka Air Permit) to operate a portable rock crushing plant (Plant) within the Olympic Region Clean Air Agency (ORCAA) jurisdiction, which includes Clallam, Grays Harbor, Jefferson, Mason, Pacific and Thurston counties. The proposed Plant qualifies for approval under ORCAA’s standard Final Determination and Order of Approval (Order) for a general rock crushing plant, herein referred to as ORCAA’s General Rock Crusher Approval.

ORCAA’s General Rock Crusher Approval conditionally approves operation of a general rock crushing plant at any single qualifying location and allows the plant to be relocated to qualifying locations, provided a record of locations the plant operated within ORCAA’s jurisdiction is maintained and conditions in the standard Order are met. The standard Order also provides approval to operate stationary nonroad engines to power portable crushing equipment, provided the engines do not remain at any location longer than 12-months. Stationary nonroad engines include engines powering generators, screens, conveyors, grinders and any other equipment that is transportable and may move, but remain stationary when the engine is operating. Stationary nonroad engines include diesel generators and engines on stationary crushers and screens, but do not include engines powering mobile equipment such as haul trucks loaders, excavators and other equipment that move when operating. Engines that remain at a location for more than 12 consecutive months do not qualify as nonroad engines and require separate approval through ORCAA<sup>1</sup>.

The General Rock Crusher Approval imposes conditions on equipment comprising the rock crushing plant, which includes ancillary equipment such as screens, conveyors, grinders and stationary nonroad engines. The General Rock Crusher Approval does not impose requirements on equipment or operations associated with aggregate mining or exhaust from mobile equipment such as loaders, excavators and haul trucks.

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<sup>1</sup>A location is any single site within a building, structure, facility, or installation

The General Rock Crusher Approval allows flexibility to replace or add equipment to the plant without notice or submitting a NOC application to ORCAA, provided conditions in the General Rock Crusher Approval are met. Conditions imposed through the General Rock Crusher Approval Order are intended to assure compliance with applicable Washington, ORCAA and Federal air standards and prohibitions, and may be enforced by ORCAA.

This Final Determination documents ORCAA's evaluation and conclusions supporting conditional approval of the Plant as a general rock crushing plant operating within ORCAA's jurisdiction. The General Rock Crusher Approval Order provides approval for the Plant to operate at any single approved location, or to move from one approved location to another, provided the Plant continues to meet the conditions in the Order.

Conclusions in this Final Determination remain valid provided the Plant continues to meet the conditions of the General Rock Crusher Approval Order, and provided the Plant is operated at approved locations. Approved locations include locations with current approval by a local authority with jurisdiction to conduct rock crushing operations. Local authorities with jurisdiction include, but are not limited to, Cities, Counties, Port Authorities, The Department of Natural Resources, The Washington Department of Ecology and Transportation Authorities.

## 2.a General Background on Required Air Permits in Washington

Pursuant to the Washington Clean Air Act under the Revised Code of Washington 70.94.152 RCW, ORCAA's Rule 6.1 requires New Source Review (NSR) for new stationary sources of air pollution in ORCAA's jurisdiction. NSR entails evaluating air quality implications prior to constructing, installing or otherwise establishing any new stationary source of air pollution, modifying an existing stationary source or replacing or substantially altering air pollution control technology. The goal of NSR is to assure projects comply with applicable air regulations and standards, including equipment performance standards and ambient air quality standards.

NSR is initiated by a project proponent submitting a Notice of Construction (NOC) application, which includes information on the proposed project of sufficient detail to characterize air impacts. NOC applications are posted on ORCAA's website and may undergo a public notice and comment period if requested by the public or if emission increases trigger an automatic public notice. Approval of a NOC is contingent on verifying the proposed new source meets the following criteria for approval from ORCAA's Rule 6.1:

1. **Performance Standards** - The new stationary source will likely comply with applicable air-performance standards such as federal new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAPs), or any performance standards adopted under chapter 70.94 of the Revised Code of Washington (RCW);
2. **BACT** - The new stationary source will employ "Best Available Control Technology" (BACT) to control all air pollutants emitted;

3. **Ambient Air Quality** – Emissions from the new stationary source will not cause or contribute to a violation of any ambient air quality standard;
4. **Federal Air Permitting Requirements** - The new stationary source secures all applicable federal air permits that may apply; and,
5. **Air Toxics** - If there is a potential for toxic air pollutant (TAP) emissions, the stationary source meets all applicable requirements of the State’s regulations for new TAP sources under Chapter 173-460 WAC.

Per ORCAA Rule 6.1(b)(1), portable stationary sources that have already received initial approval through a NOC and stationary nonroad engines are allowed to relocate and operate at temporary locations<sup>2</sup>, provided a Notice of Intent to Operate (NOI) application is filed at least 15-days prior relocating the source. Requirements for operating portable stationary sources at temporary locations (less than 12-months) are included in ORCAA Rule 6.1.7. Rule 6.1.7 provides that ORCAA may set specific conditions for operating a temporary or portable source as are reasonably necessary to assure compliance with applicable air pollution control requirements. The requirements for operating temporary and portable sources are as follows:

1. **Ambient Air Quality** – Operation shall not cause a violation of any ambient air quality standard;
2. **Nonattainment Areas** – If the operation is in a nonattainment area, it shall not interfere with the scheduled attainment of ambient standards;
3. **Performance Standards** – The temporary portable source shall operate in compliance with all applicable air pollution rules and regulations;
4. **Federal Air Permitting Requirements** – A temporary portable source that is considered a major stationary source within the meaning of Rule 1.4 shall also comply with the requirements in WAC 173-400-141 and Rule 6.1.4(b) as applicable;
5. **Previous Orders** – Any operating condition in an Order previously issues to a temporary potable source shall remain in effect upon relocating the source within ORCAA’s jurisdiction unless specifically superseded by condition in a subsequent Order;
6. **Operation of Stationary Nonroad Engines** – Operation of stationary nonroad engines shall not exceed 90 operating days in any calendar year anywhere within ORCAA’s jurisdiction unless a regulatory Order has been issued. In this case, an Order will be issued, therefore, operation of stationary nonroad engines are not limited to 90-days.

## 2.b Air Permits Required for Rock Crushing Operations

Rock crushing plants emit particulate matter air pollution and have the potential to emit Toxic Air Pollutants (TAP) such as, but not limited, to crystalline silica, lead, and asbestos. Rock crushing plants are regulated “Stationary Sources” of air pollution, and may be regulated as “Temporary Sources” if the plant is portable and moved from location to location. Proposed new rock crushing plants in ORCAA’s jurisdiction are

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<sup>2</sup> Per ORCAA Rule 1.4, “Temporary” means a period of time not to exceed one (1) year.

subject to NSR and approval through a NOC. Once approved through a NOC, portable rock crushing plants may relocate in ORCAA’s jurisdiction, provided an NOI application is filed at least 15-days prior to relocating, and provided compliance with the conditions of operation in ORCAA Rule 6.1.7 are maintained.

Engines qualifying as “stationary nonroad engines<sup>3</sup>” are exempt from NSR under ORCAA’s Rule 6.1(c), but require a NOI under Rule 6.1.7. Stationary Nonroad engines greater than 50 brake horsepower (bhp) are allowed to be sited and operate at temporary locations in ORCAA’s jurisdiction provided an NOI is submitted at least 15-days prior to establishing at any site, and provided requirements in ORCAA Rule 6.1.7 are met. An engine remaining at a site longer than 12-months does not qualify as a stationary nonroad engine and is considered and regulated as a “Stationary Source.” Engines greater than 50 bhp and remaining at a location longer than 12 consecutive months are not approved under the General Rock Crusher Approval and require separate, site specific, approval through ORCAA.

This General Rock Crusher Approval and associated Order satisfy the requirement to submit a NOI application for both the Plant and stationary nonroad engines for certain pre-approved locations, provided conditions in the proposed Order are met. This flexibility was included in the General Rock Crusher Approval Order to avoid permitting time and costs that would otherwise incur due to future moves of the Plant. This flexibility is allowed based on a generalized air quality analysis, which demonstrates compliance with applicable performance standards and criteria of approval generally for ORCAA’s region. The generalized air quality analysis encompasses maximum air impacts from a portable rock crushing plant wherever located in ORCAA’s jurisdiction. The General Rock Crusher Approval Order includes conditions to ensure air emissions and impacts won’t exceed those reviewed in the generalized air quality analysis.

Through the Washington Clean Air Act, ORCAA has authority to regulate stationary engines and stationary nonroad engines located in its jurisdiction. ORCAA does not have authority to regulate engines on mobile sources. Therefore, this Final Determination does not consider or address exhaust from mobile equipment such as loaders, transport trucks, excavators or any other equipment that moves while it operates. However, ORCAA does have authority to regulate dust emissions from haul roads caused by mobile vehicle traffic that directly support the crushing operation.

This General Rock Crusher Approval addresses emissions from the rock crushing plant, dust from haul roads directly supporting the plant, and emissions from stationary nonroad engines supporting the plant. It does not address emissions from stationary engines (meaning stationary engines that remain longer than 12-months at a location).

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<sup>3</sup> Stationary Nonroad engines include engines powering generators, screens, conveyors, grinders and any other equipment that is transportable and may move, but remain stationary when the engine is operating. Stationary Nonroad engines do not include engines powering mobile equipment such as haul trucks loaders, excavators and other equipment that moves when operating. Engines that remain at a location for more than 12 consecutive months, or a shorter period of time for an engine located at a seasonal source, do not qualify as a nonroad engine. A location is any single site at a building, structure, facility, or installation.

Rock crushing plants requiring stationary engines greater than 50 bhp require site-specific review of air impacts and are not approved under this General Rock Crusher Approval. Therefore, plants requiring stationary engines greater than 50 bhp must secure ORCAA’s approval through a site-specific NOC application.

This General Rock Crusher Approval provides approval for a Plant to operate at any single approved location or to move from one approved location to another without having to submit an NOI. This flexibility is allowed provided the Plant continues to meet conditions in the General Rock Crusher Approval Order.

### 3. General Rock Crushing Plant Description

The Plant proposed by <Name> meets the design limitations and operating criteria for approval under ORCAA’s General Rock Crusher Approval.

**Table 1: General Rock Crushing Plant**

EQUIPMENT	TYPE	AIR POLLUTION CONTROL	CAPACITY & PRODUCTION LIMITS
Crushers Ancillary Equipment	Any Screens Scalpers Grizzlies Conveyors	Water spray applied throughout plant at locations where fugitive dust generated remains airborne.	Plant-site production limited to no more than 5,400 tons per day (annual average) and 1,000,000 tons per year.
Stationary nonroad Engines <sup>4</sup>	Diesel	Ultra-low-sulfur diesel	Cumulative capacity of stationary nonroad engines not exceeding 2000 brake horsepower (bhp)

Under ORCAA’s General Rock Crusher Approval, a rock crushing plant can be comprised of multiple crushers, conveyors, screens and other ancillary equipment, provided daily plant-site production is limited to no more than 5,400 tons per day of crushed material on an annual average basis.

The General Rock Crusher Approval provides approval generically for crushers and ancillary equipment comprising the approved plant: Make, model and serial number of individual pieces of equipment are not specified in the associated Order. Equipment comprising the plant may be changed, replaced or added to Plant without prior approval through a NOC or a formal Notice. For example, a crusher may be added to a plant, provided compliance with plant-site production limits of no more than one (1) million tons per year and 5,400 tons per day on an annual average basis are

<sup>4</sup> Stationary Nonroad engines do not include engines powering mobile equipment such as haul trucks loaders, excavators and other equipment that moves when operating, but do include engines powering generators, screens, conveyors, grinders and any other equipment that remains stationary when operating.

maintained. Likewise, an individual crusher, screen or generator may be replaced without prior approval of a NOC or formal notice to ORCAA.

Under the General Rock Crusher Approval, the plant may run on line-power or may rely on stationary nonroad engines, provided:

- Stationary nonroad engines greater than 50 hp maintain their “Nonroad” status by remaining no longer than 12-months at any location;
- Cumulative power of all stationary nonroad engines do not exceed 2,000 bhp; and,
- Operate using ultra-low-sulfur diesel fuel (ULSD).

The General Rock Crusher Approval allows the crushing plant to be relocated, provided it is sited at locations with current approval by a local authority with jurisdiction to conduct rock crushing and meets minimum distance buffers required by Condition #4 in the standard Order. Qualifying sites include, but are not limited to, registered surface mining sites with a current Sand and Gravel permit issued by the Washington Department of Ecology; highway and road construction projects; construction sites with permits to recycle concrete, asphalt or aggregate; and, landfills with current permits to conduct crushing or grinding operations. Unless approved ahead of time by ORCAA through a site-specific air analysis, the Plant must be located no closer than:

- 150 feet from any adjacent property line; and,
- 500 feet from any residence, occupied commercial building, school, hospital, nursing home or other sensitive receptor.

Minimum distance buffers were based on a screening-level Ambient Air Quality Analysis (AAQA) to determine minimum distances ORCAA accepts under the General Rock Crusher Approval.

The General Rock Crusher Approval prohibits crushing or grinding of materials that may be contaminated with certain hazardous or toxic substances, and require feedstock monitoring to assure prohibited materials are not processed. Specifically, processing any feedstock containing Presumed Asbestos Containing Material (PACM), material painted with lead-containing paint or material including petroleum contaminated soils is prohibited. Feedstock monitoring is required to assure these materials are not processed.

## 4. Emissions

Air pollutant emissions estimates for a general rock crushing plant under ORCAA’s General Rock Crusher Approval are shown in the following tables. Emission rates reflect realistic maximum emissions from a general rock crushing plant and were used to base applicability and compliance decisions. An operating schedule of eight hours per day, five days per week and 40 weeks per year was used to estimate maximum emissions. ORCAA believes this operating schedule adequately brackets “worst case” emissions from a general rock crushing plant operating in the Puget Sound region. Emissions rates reflect all equipment operated at maximum output and maximum

emissions when the plant is operating except for stationary nonroad engines. A “load factor” of 43% was used to model emissions from stationary nonroad engines. This value represents an average load factor for nonroad engines associated with rock crushing operations and was obtained from the EPA publication titled, Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling (EPA-420-R-10-016 NR-005d, July 2010), Tables 9 and 10.

Emissions calculation spreadsheets included in the attachments provide details on all equations, emissions factors and assumptions used to estimate air pollutant emissions. The following key assumptions were used:

- Primary, secondary and tertiary crushing
- Initial, primary, secondary and fines screening
- Water spray at drop points and other areas of the plant to control fugitive dust
- Operation at 5,400 tons per day (annual average), 8 hours per day, 5 days per week and 40 weeks per year
- One quarter mile of unpaved haul road distance
- Stationary nonroad engines totaling 2000 bhp

Air pollutant emissions from the crushing plant itself were calculated using emissions factors from Section 11.19.2 of EPA’s Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (EPA, AP-42). Emissions rates reflect “controlled” emissions. For crushers, screens, and conveyors, particulate matter air pollution (PM) is emitted from multiple points and components of equipment as it operates, and includes particulate matter (PM<sub>10</sub>) and fine particulate matter PM<sub>2.5</sub>. This is referred to as “fugitive PM” since the PM is not captured by a control device. The primary method for controlling fugitive PM is preventing it in the first place using various methods, but primarily water spray applied at points in the crushing plant where fugitive PM is generated. Emissions rates in the following tables reflect water spray control throughout the plant where needed.

Respirable crystalline silica, a Toxic Air Pollutant (TAP) regulated under Washington’s Controls for New Sources of Toxic Air Pollutants (WAC 173-460), was calculated as a fraction of the PM<sub>2.5</sub> emitted based on measured ambient concentrations of crystalline silica at aggregate producing sources in California (Washington-specific data was not available). A percent crystalline silica in ambient PM<sub>2.5</sub> of 5.58% was used, which was obtained from the Journal of the Air & Waste Management Association article titled, PM<sub>4</sub> Crystalline Silica Emissions Factors and Ambient Concentrations at Aggregate-Producing Sources in California (Journal of the Air & Waste Management Association, 59:11, John R. Richards, Todd T. Brozell, Charles Rea, Geoff Boraston and John Hayden, 2009).

Regarding stationary nonroad engines, emissions rates in the following tables characterize emissions from stationary nonroad engines only, such as generator engines and engines powering crushers, screens and conveyors. Emissions from engines on mobile vehicles such as loaders, haul trucks, excavators are not included. For stationary nonroad engines, emissions rates for NO<sub>x</sub>, CO, HC, PM, PM<sub>10</sub>, PM<sub>2.5</sub> and

SOx reflect emissions rates from section 3.4 of EPA's AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (AP-42). TAP emission rates were based on emission factors from AP-42, Sections 3.3 and 3.4. Engine emissions rates were calculated assuming engines are operated at an average load factor of 43% every hour the crushing plant is operating. Though this assumption likely overestimates emissions from stationary nonroad engines, it results in a defensible bracket of realistic worst-case emissions. For this reason, the assumption was used to characterize emissions from a general crushing plant.

Emissions from haul roads were calculated using equations from Section 13.2.2 of AP-42. Emissions rates for haul roads were based on an average plant production of 5,400 tons per day and the number of trips it would take for a typical haul truck to move product off-site. A 660-foot, unpaved haul road was assumed and dust control via wet suppression. The following other key assumptions were used:

- Silt content of haul roads based on AP-42 Table 13.2.2-1 (8/04). Selected mean of "Sand and gravel processing" plant road.
- Mean Vehicle weight for loaded and unloaded haul trucks from Ecology's General Permit for Rock Crushers, TSD, page 11.
- Haul road wet suppression dust control efficiency of 75% based on Figure 13.2.2-1 in AP-42, section 13.2.2.

The following tables summarize emissions from a rock crushing plant approved under ORCAA's General Rock Crusher Approval.

**Table 2: Hourly Criteria Pollutant Emissions Rates (lbs/hr)**

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	NO <sub>x</sub>	CO	HC	SO <sub>x</sub>
Crushing Plant	6.53	2.85	0.29	0.00	0.00	0.00	0.00	0.00
Haul Roads	2.57	2.57	0.26	0.00	0.00	0.00	0.00	0.00
Stationary nonroad Engines	1.40	1.40	1.40	0.00	26.00	11.00	1.41	0.81
Total	10.49	6.81	1.95	0.00	26.00	11.00	1.41	0.81

**Table 3: Daily Criteria Pollutant Emissions Rates (lbs/day)**

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	NO <sub>x</sub>	CO	HC	SO <sub>x</sub>
Crushing Plant	52.20	22.77	2.35	0.00	0.00	0.00	0.00	0.00
Haul Roads	20.55	20.55	2.06	0.00	0.00	0.00	0.00	0.00
Stationary nonroad Engines	4.82	4.82	4.82	4.82	89.44	37.84	4.85	2.78
Total	77.57	48.13	9.22	4.82	89.44	37.84	4.85	2.78

**Table 4: Annual Criteria Pollutant Emissions Rates (Tons/yr)**

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	NO <sub>x</sub>	CO	HC	SO <sub>x</sub>
Crushing Plant	7.25	3.16	0.33	0.00	0.00	0.00	0.00	0.00
Haul Roads	4.83	4.83	0.48	0.00	0.00	0.00	0.00	0.00



Stationary nonroad Engines	0.48	0.48	0.48	0.00	8.94	3.78	0.49	0.28
Total	12.56	8.47	1.29	0.00	8.94	3.78	0.49	0.28

**Table 5: Toxic Air Pollutant Emissions Summary**

Pollutant	Emission Rates			Small Quantity Emission Rate			Modeling Required <sup>6</sup> (yes or no)
	(lb/hr) <sup>2</sup>	(lb/day) <sup>3</sup>	(lb/yr) <sup>4</sup>	(lb/hr) <sup>5</sup>	(lb/day) <sup>5</sup>	(lb/yr) <sup>5</sup>	
Crystalline Silica <sup>7</sup>	0.0307	0.37	90.24	NA	0.394	NA	no

1. Emission factors from EPA AP-42.
2. Emission Rate (lb/hr) = Fuel Energy Content(btu/gal) \* Load Factor (%) \* Max Fuel Flow Rate(gal/hr) \* Emission Factor(lb/MMbtu)\*(1 MMBtu/1,000,000 Btu)
3. Emission Rate (lb/day) = Emission Rate (lb/hr)\*hrs/day
4. Emission Rate (lb/yr) = Emission Rate (lb/hr)\*Maximum hrs/yr
5. The small quantity emission rate for each pollutant is defined in Chapter 173-460 of the Washington Administrative Code
6. If the calculated emission rate is greater than the Small Quantity Emission Rate, then modeling is required
7. Crystalline Silica percent of PM<sub>2.5</sub> obtained from [PM4 Crystalline Silica Emissions Factors and Ambient Concentrations at Aggregate-Producing Sources in California](#), Journal of the Air & Waste Management Association, 59:11, 1287-1295

## 5. Criteria for Approval

ORCAA’s Rule 6.1 establishes the following general criteria for approving new stationary sources of air pollution in ORCAA’s region:

1. **Performance Standards** - Any new stationary source or modification will likely comply with applicable air-performance standards such as the federal new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAPs), and any performance standards adopted under chapter 70.94 of the Revised Code of Washington (RCW);
2. **BACT** - The new or modified stationary source is controlled to a level that meets the standard of “Best Available Control Technology” (BACT);
3. **Ambient Air Quality** – Any increase in air emissions will not cause or contribute to violation of any ambient air quality standard;
4. **Federal Air Permitting Requirements** – All applicable federal air permits, if required, are secured;
5. **Washington Air Toxics Regulations** - If there are increases in toxic air pollutant (TAP) emissions, the requirements of Washington’s Controls for New Sources of Toxic Air Pollutants under Chapter 173-460 WAC are met; and,
6. **Public Outreach** – Public notice and comment requirements in WAC 173-400-171 and ORCAA’s regulations are met.

As discussed previously, stationary nonroad engines must operate in compliance with applicable performance standards and must not cause or contribute to violation of any ambient air quality standard.

ORCAA determined these criteria are met for the general rock crushing plant and any associated stationary nonroad engines up to 2,000 bhp as described earlier. The following sections provide more detail.

## 5.1. Applicable Performance Standards (Summary)

ORCAA's Rule 6.1.4(a)(1) requires a finding that any new or modified stationary source will likely comply with applicable state, federal and local performance standards for air emissions including emission standards adopted under chapter 70.94 of the Revised Code of Washington (RCW), emissions standard of ORCAA, and federal emission standards including New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), and National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT standards). The performance standards in Table 6a were determined applicable for a general rock crushing plant approved under ORCAA's General Rock Crusher Approval. The performance standards in Table 6b are relevant performance standards determined inapplicable.

**Table 6a: Applicable Performance Standards**

Regulation Title Citation	Applicable Performance Standards	Applies to:
<i>General Standards for Maximum Visual Emissions</i> WAC 173-400-040(2) ORCAA Rule 8.2(a)	Prohibits emissions with opacity of greater than 20% for more than three (3) minutes in any one hour.	Crushers Screens Conveyors Stationary Engines
<i>Control Equipment Maintenance and Repair</i>	ORCAA Rule 8.8 requires that all air contaminant sources keep any process and/or air pollution control equipment in good operating condition and repair.	All emissions units
<i>Emissions Detrimental to Persons or Property</i> WAC 173-400-040(6) & ORCAA 7.6	Prohibits emissions of any air contaminant from any source that are detrimental to persons or property.	All emissions units and fugitive sources
<i>Fallout Prohibition</i> WAC 173-400-040(3) & ORCAA 8.3(e)	Prohibits particulate emissions from any source to be deposited, beyond the property under direct control of the owner or operator of the source, in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material was deposited.	All emissions units and fugitive sources
40 CFR Part 60, Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants	<i>Plants constructed, modified or reconstructed after August 31, 1983 but before April 22, 2008:</i> <ul style="list-style-type: none"> <li>• Fugitives - 10% opacity</li> <li>• Crushers - 15% opacity</li> </ul> Initial performance test required per §60.675	Rock Crushers Screens Conveyors
	<i>Plants constructed, modified or reconstructed after April 22, 2008:</i> <ul style="list-style-type: none"> <li>• Fugitives - 7% opacity</li> <li>• Crushers - 12% opacity</li> </ul> Initial performance test required per §60.675	
40 CFR Part 89 - <i>Control of Emissions from New and in-use Nonroad</i>	Establishes emissions standards for nonroad engines not yet subject to 40 CFR Part 1039 (see next row in table).	Applies to nonroad engines not yet subject to 40 CFR Part 1039 based on

Regulation Title Citation	Applicable Performance Standards	Applies to:
<i>Compression-Ignition Engines</i>	Establishes NO <sub>x</sub> , HC, CO and PM emissions certification standards based on the model-year and size of the engine. Engine certification standards are summarized in Table 1 of §89.112.	model-year and size of engine.
<i>40 CFR Part 1089 – Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines</i>	Establishes emissions standards for nonroad engines.	Applies to newer model-year stationary and nonroad engines based on model-year and size of engine.

**Table 6b: Relevant Performance Standards Determined Inapplicable**

Regulation Title Citation	Relevant Performance Standard Determined Inapplicable	Basis
40 CFR 60, Subpart IIII	Standards of performance for stationary compression ignition internal combustion engines	Subparts IIII and ZZZZ do not apply to nonroad engines. Stationary engines (those that remain longer than 12-months at any location) are not approved under the <u>General Rock Crusher Approval</u> . Therefore, these standards do not apply.
40 CFR 63, Subpart ZZZZ	National emissions standards for hazardous air pollutants for stationary reciprocating internal combustion engines	

## 5.2. Applicable Performance Standards (Crushing Plant)

Rock crushing plants are potentially subject to requirements under 40 CFR Part 60, Subpart 000 - Standards of Performance for Nonmetallic Mineral Processing Plants (Subpart 000). Subpart 000 applies to “fixed” crushed stone plants with capacities greater than 25 tons per hour and “portable” crushed stone plants with capacities greater than 150 tons per hour, as defined in §60.671, that commenced construction, modification, or reconstruction after August 31, 1983. Capacity as defined under §60.671 means the cumulative rated capacity of all initial crushers that are part of the plant.

Subpart 000 regulates rock crushing plants that are not enclosed in a building or structure as “fugitive” sources of emissions, and imposes specific opacity standards based on whether the “Affected Facility” (crusher, screen, conveyor, etc.) was constructed, modified or reconstructed before or after August 31, 1983 as follows:

**Table 7: Applicable Opacity Standards per Subpart 000**

Constructed, modified, or reconstructed:	General Fugitive Emissions Standard (opacity)	Standard for Crushers (opacity)
After August 31, 1983 but before April 22, 2008	10%	15%
After April 22, 2008	7%	12%

To simplify compliance assurance, and because opacity readings are required to be made in 5% increments per the EPA Reference Test Method for opacity, the General Rock Crusher Approval Order relies on ORCAA’s general opacity standard in Rule 8.2(a) as a compliance assurance “action level” for triggering enforcement actions. Though the General Rock Crusher Approval Order does not specifically require opacity monitoring, ORCAA encourages at least daily opacity monitoring to assure particulate control systems are operating properly. Ongoing monitoring is not specifically required since this would impose an added compliance requirement regardless of whether opacity standards are being met. However, ORCAA’s expectation is that plant operators will monitor opacity at least daily and take appropriate action to maintain particulate control systems. If lack of opacity monitoring is determined to be the cause of an opacity problem, ORCAA has the regulatory means and authority to require opacity monitoring separate and independent of the standard Order.

Besides opacity standards, Subpart OOO requires affected crushing plants constructed, modified, or reconstructed or after April 22, 2008 that use wet suppression to control emissions, to perform monthly inspections to check that water is adequately flowing to discharge spray nozzles in the wet suppression system. The owner or operator must initiate corrective action within 24 hours and complete corrective actions as expeditiously as practical if the owner or operator finds water is not flowing. Subpart OOO also requires the owner or operator record each inspection of the water spray nozzles, including the date of each inspection and any corrective actions taken, in a logbook. Conditions #12 and #13 in the standard Order include these requirements.

### 5.3. Applicable Performance Standards (Engines)

Regarding stationary nonroad engines, the emissions standards from either 40 CFR Part 89 or 40 CFR Part 1039 for Oxides of Nitrogen (NO<sub>x</sub>), Carbon Monoxide (CO), Hydrocarbons (HC) and particulate matter (PM) will apply. Stationary Nonroad engines are considered “constant speed” engines under these subparts and are exempt from the opacity standards that would otherwise apply.

These federal regulations require engine manufacturers to certify engines with respect to certain standard based on the model-year and size of the engine, and to provide operation and maintenance recommendations for owners and operators to maintain emission control features. In general, Part 89 standards apply to older model-year engines and Part 1039 standards apply to newer model-year engines. Under both federal regulations, compliance is assured through an engine certification process and applies primarily to engine manufacturers at the point in time the engine is manufactured.

Owners and operators of federally certified engines are required to operate and maintain engines per manufacturer recommendations to ensure ongoing compliance with the federal standards over the life of an engine. Direct compliance verification through emissions testing or alternative means is not required unless an engine is rebuilt.

Regarding the State of Washington and ORCAA's general opacity standard of 20% for 3-minutes in any one hour, only engines operated as stationary engines are subject. Stationary Nonroad engines are not subject to the to this standard: Per WAC 173-400-035, stationary nonroad engines are not subject to:

- New source review.
- Control technology determinations.
- Emission limits set by the state implementation plan (SIP).

Since the Washington and ORCAA opacity standards are part of the SIP, they do not apply to stationary nonroad engines.

Instead of an opacity limit on stationary nonroad engine emissions, the General Rock Crusher Approval Order imposes a single opacity action level of 20%, as determined through visual opacity readings per EPA Method 9. This action level is established as an opacity compliance assurance requirement under Condition #9 in the standard Order. Per Condition #9, opacity exceeding the 20% action level, as determined by the plant operator or ORCAA, triggers a requirement that the owner or operator initiate maintenance and/or repair of the engine to eliminate any excess opacity. The underlying intent of this regulatory approach is to encourage opacity monitoring and maintenance actions to maintain the engine consistent with manufacturer recommendations.

#### **5.4. Best Available Control Technology (BACT)**

ORCAA's Rule 6.1.4(a)(2) requires any new stationary source or modification employ Best Available Control Technology (BACT) for all pollutants not previously emitted or whose emissions would increase because of the new source or modification. The use of water spray to suppress dust emissions when the plant is operating is considered BACT for a rock crushing plant. Condition #7 in the standard Order requires a water spray system for ORCAA's General Rock Crusher Approval. Stationary Nonroad engines are specifically precluded from SIP requirements, including BACT.

## 5.5. Protection of Ambient Air Quality Standards

ORCAA's Rule 6.1.4(a)(3) requires a demonstration that any new stationary source of air pollution and any modification to an existing stationary sources of air pollution will not delay the attainment date of an area not in attainment, or cause or contribute to an existing violation of any Ambient Air Quality Standard (AAQS). Stationary Nonroad engines are subject to the same criteria for approval. This demonstration requires two separate tests:

1. Emissions increases will not cause a violation; and,
2. Emissions increases will not contribute to an existing violation in any area not meeting an AAQS (also referred to as a non-attainment area).

ORCAA completed a screening-level Ambient Air Quality Analysis (AAQA) to evaluate ambient air impacts from a general rock crushing plant including ancillary stationary nonroad engines. Nonroad engines and the crushing plant were modeled separately and then impacts were added together. Model results showed the points of maximum impact for both engines and crushing equipment occurring at or near the closest boundary allowed by the General Rock Crusher Approval Order, which is 150 feet from the plant. All equipment (crushers, screens, conveyors and engines) were modeled at realistic maximum hourly, daily and annual emissions rates as explained previously in Section 4: Eight hours per day, five days per week and 40 weeks per year.

Background concentrations for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, CO and SO<sub>2</sub> were obtained from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) on-line database. NW AIRQUEST provides a database of location-specific design values for criteria pollutants based on monitoring data from 2009 through 2011. Design values are concentrations representing background pollutant concentrations for averaging periods consistent with the ambient standards. The background concentrations from NW AIRQUEST used in the AAQA supporting the General Rock Crusher Approval were estimates of background concentrations for south Thurston County. South Thurston County background concentrations were used since these concentrations likely bracket background concentrations throughout ORCAA's jurisdiction.

The results in Table 8 show total impacts (crushing plant + engines + background) are less than the applicable AAQSs for all pollutants requiring review. This outcome satisfies the first test, which is to provide demonstration that air pollutant emissions are unlikely to cause violation of any AAQS. Since the analysis is both general and represents maximum impacts, conclusions remain the same regardless of where a general crushing plant is located in ORCAA's region.

**Table 8: Ambient Impacts Summary**

Pollutant	Impacts ug/m3				Ambient Standard
	Crushing Plant	Engines	Background	Cumulative	ug/m3
PM <sub>10</sub> (24-hr ave)	67.54	5.51	32.00	105.05	150.00
PM <sub>2.5</sub> (annual ave)	0.66	0.38	5.40	6.44	12.00
PM <sub>2.5</sub> (24-hr ave)	6.96	5.51	18.00	30.48	35.00
Lead (24-hr ave)	0.00	0.00	0.00	0.00	0.15
NO <sub>2</sub> (annual ave)	0.00	0.35	10.90	11.25	100.00
NO <sub>2</sub> (hourly ave)	0.00	89.31	86.48	175.79	188.00
CO (8-hr ave)	0.00	528.99	902.00	1,430.99	10,000.00
CO (hourly-hr ave)	0.00	755.70	1,418.66	2,174.36	40,000.00
SO <sub>2</sub> (annual ave)	0.00	0.22	2.36	2.58	52.00
SO <sub>2</sub> (24-hr ave)	0.00	3.19	4.19	7.38	367.00
SO <sub>2</sub> (3-hr ave)	0.00	50.02	no data	50.02	1,300.00
SO <sub>2</sub> (hourly ave)	0.00	55.58	no data	55.58	196.00

The second test requires demonstration that emissions will not contribute to an existing violation of an area not meeting an AAQS (also referred to as a non-attainment area). ORCAA’s Rule 6.1 and the State’s rules under Chapter 173-400 WAC both provide that, if the modeled concentrations of allowable emissions are below certain significance levels (Referred to as “Insignificant Impact Thresholds” in ORCAA’s Rule 6.1), it can be concluded that the proposed source will not contribute to a violation of an AAQS.

Currently, there are no areas within Washington designated nonattainment for an AAQS. Tacoma-Pierce County was re-designated to “Attainment” in March 2015 with respect to the daily PM<sub>2.5</sub> standard. Since the Tacoma-Pierce County area is the area with the most recent nonattainment designation, the second test was evaluated with respect to the former Tacoma-Pierce County daily PM<sub>2.5</sub> nonattainment area. The closest boundary of the Tacoma-Pierce County nonattainment area is at least 3 miles (5,000 meters) from the closest boundary with ORCAA’s jurisdiction. Therefore, modeling results at 5,000 meters were used to determine potential significance of ambient air impacts.

Results, which are provided in Table 9 below, show that impacts at 5,000 meters to a general rock crushing plant are below all significant impact thresholds. This result adequately demonstrates that impacts from a general crusher are not likely to contribute to any impacts in nonattainment areas and so-called “Maintenance Areas.” If an area within ORCAA’s region or in an adjacent jurisdiction is designated nonattainment of an AAQS in the future, this AAQA will be repeated and necessary adjustments will be made to ORCAA’s General Rock Crusher Approval.

**Table 9: Significance of Impacts to Nonattainment and Maintenance Areas**

Pollutant	Impacts ug/m3			Significance Thresholds ug/m3
	Crushing Plant	Engines	Total	
PM <sub>10</sub> (annual ave)	0.08	0.01	0.09	1
PM <sub>10</sub> (24-hr ave)	0.81	0.17	0.98	5
PM <sub>2.5</sub> (annual ave)	0.01	0.01	0.02	0
PM <sub>2.5</sub> (24-hr ave)	0.08	0.17	0.25	1
Lead (24-hr ave)	0.00	0.00	0.00	0.08
NO <sub>2</sub> (annual ave)	0.00	0.01	0.01	1
CO (8-hr ave)	0.00	16.40	16.40	500
CO (hourly-hr ave)	0.00	23.43	23.43	2,000
SO <sub>2</sub> (annual ave)	0.00	0.01	0.01	1
SO <sub>2</sub> (24-hr ave)	0.00	0.10	0.10	5
SO <sub>2</sub> (3-hr ave)	0.00	1.55	1.55	25
SO <sub>2</sub> (hourly ave)	0.00	1.72	1.72	30

## 5.6. Washington Air Toxics Regulation

Washington’s regulations titled Controls for New Sources of Toxic Air Pollutants (Air Toxics Regulation) under Chapter 173-460 of the Washington Administrative Code apply to new stationary sources of Toxic Air Pollutants (TAP). The purpose of this regulation is to, “... maintain such levels of air quality as will protect human health and safety.” The TAP covered under the regulation include carcinogens and non-carcinogens. The regulation allows for a multi-tiered approach to assess potential health and safety impacts from TAP increases.

The “First Tier Review” involves comparing estimated ambient TAP impacts with Acceptable Source Impact Levels (ASIL), which are established in the Air Toxics Regulation on a pollutant-by-pollutant basis. If the modeled impact of the increase in emissions of a TAP does not exceed its corresponding ASIL, the First Tier Review is met for that TAP. This analysis typically involves using an ambient air quality model to predict ambient concentrations of a TAP and then comparing the impact with the TAP’s corresponding ASIL. However, the Air Toxics Regulation also provides that, if an emission rate for a TAP is less than it’s “Small Quantity Emission Rate” (SQER), then it can be concluded that emissions are sufficiently low to ensure compliance with the ASIL without further analysis (WAC 173-460-020(7)).

For pollutants with ambient concentration found to be greater than their ASIL, a “Second Tier Review” is required. Second Tier Reviews involve more refined modeling analyses and approval by the Washington Department of Ecology in addition to ORCAA’s review.



Lastly, for TAP that cannot pass a Second Tier Review, the Air Toxics Regulation requires an even more refined “Third Tier Review.”

TAP emissions from a general rock crushing plant were calculated and a 1<sup>st</sup> Tier review was completed. As explained in previous sections, stationary nonroad engines are not regulated as stationary sources and exempt from NSR including review under the Air Toxics Regulation. Therefore, the 1<sup>st</sup> Tier review of TAP emissions from the Plant does not reflect emissions from stationary nonroad engines. Results from this analysis demonstrate that TAP emissions from a general rock crushing plant are sufficiently low to protect human health and safety.

**Table 10: ASIL Analysis Summary**

Pollutant	Modeled Concentration (ug/m3)	ASIL3 (ug/m3)	ave period	Pass (y/n)
Silica (crystalline, Respirable)	0.73	3.00	24-hr	yes

### 5.7. Federal Air Permitting Requirements

No federal air permits are required since a general rock crushing plant under ORCAA’s General Rock Crusher Approval is a minor source.

### 5.8. Public Outreach

Public notice of individual applications for approval of a general rock crushing plant under ORCAA’s General Rock Crusher Approval are posted on ORCAA’s website when applications are made. Any public concerns or requests for a public comment period or hearing are addressed on a case-by-case basis. For this case, no comments from the public were received.

## 6. Annual Registration Required

Approval of a general rock crushing plant under ORCAA’s General Rock Crusher Approval is predicated on annually registering the rock crushing plant with ORCAA and paying annual registration fees. Maintaining annual registration with ORCAA allows continued operation of the general rock crushing plant within ORCAA’s jurisdiction whether the plant remains long term at an approved location or relocates to different approved locations throughout the year.

## 7. State Environmental Policy Act (SEPA) Compliance

Approved locations under ORCAA's General Rock Crusher Approval must have exiting approval to conduct rock crushing operations. This is a requirement of Condition #3 in the standard Order. With this requirement in place, rock crushing operations at approved locations should already be covered under existing SEPA environmental documents. Provided SEPA for an approved location already covers rock crushing operations, establishing a general rock crusher at the site does not re-trigger SEPA.

## 8. Conditions of Approval

The following conditions of approval are adopted in the standard Order for general rock crushing plants approved under ORCAA's General Rock Crusher Approval. These conditions apply as long the plant is annually registered with ORCAA, or until superseded. These conditions are enforceable and may be subject to enforcement actions including penalties if compliance is not maintained.

1. **Rock Crushing Plant:** <Name> is approved to operate a rock crushing plant consisting of equipment listed in the following table, in accordance with this Order of Approval (Order), at qualifying locations within the jurisdiction of Olympic Region Clean Air Agency (ORCAA), which includes Clallam, Grays Harbor, Jefferson, Mason, Pacific and Thurston counties. This Order approves operation of the rock crushing plant at any single qualifying site at any given time and allows the plant to be relocated to qualifying locations provided a record of operating locations is maintained per condition #12. This Order imposes requirements for equipment comprising the rock crushing plant only: Not equipment or operations associated with aggregate mining.

EQUIPMENT	TYPE	AIR POLLUTION CONTROL	CAPACITY & PRODUCTION LIMITS
Crushers	Any	Water spray applied throughout plant at locations where fugitive dust generated remains airborne.	Plant-site production limited to no more than: <ul style="list-style-type: none"> <li>• 5,400 tons of material processed per day (annual average)</li> <li>• 1,000,000 tons per year.</li> </ul>
Ancillary Equipment	Screens Scalpers Grizzlies Conveyors		
Stationary Nonroad Engines <sup>5</sup>	Diesel	Ultra-low-sulfur diesel	Cumulative capacity of stationary nonroad engines not exceeding 2000 brake horsepower (bhp)

[Regulatory Basis: ORCAA 6.1.2(I)]

<sup>5</sup> Stationary Nonroad engines include engines powering generators, screens, conveyors, grinders and any other equipment that remain stationary when operating. Engines powering mobile equipment such as haul trucks loaders, excavators and other equipment that move when operating are not regulated by ORCAA.

2. **Annual Registration:** The owner shall register the rock crushing plant with ORCAA annually and pay annual registration fees.  
[Regulatory Basis: ORCAA 4.1]
  
3. **Approved Locations:** The rock crushing plant may be sited and operated at any of the following qualifying locations, provided the location is not part of an existing major stationary source<sup>6</sup> of emissions, plant-site daily production does not exceed 5,400 tons per day (annual average), and minimum distance buffers prescribed in Condition 4 are met:
  - a. Registered surface mining sites with a current Sand and Gravel permit issued by the Washington Department of Ecology;
  - b. Sites located in proximity to and in support of government road construction projects;
  - c. Landfills; and,
  - d. Any site with current approval, by the city or county agency with jurisdiction, to conduct aggregate crushing operations.[Regulatory Basis: ORCAA 6.1.4]
  
4. **Minimum Distance Buffers:** The rock crusher must be located a minimum of 150 feet from any property line and 500 feet from any residence, occupied commercial building, school, hospital, nursing home or other sensitive receptor. Exceptions may be granted by ORCAA, following a site-specific review of air impacts prior to relocating the rock crusher to any location that does not conform to the stated buffers.  
[Regulatory Basis: ORCAA 6.1.4]
  
5. **Prohibited Material:** The following feedstocks shall not be processed through either crushing, grinding or screening:
  - a. Presumed Asbestos Containing Material (PACM) or any feedstock contaminated with any percentage of PACM as follows:
    - i. For purposes of this condition, “Presumed Asbestos Containing Material (PACM)” means any soft concrete, roofing material, thermal system insulation and surfacing material found in a building;
    - ii. PACM may be rebutted provided it is tested and determined not to be Asbestos Containing Material (ACM);
    - iii. “Asbestos Containing Material (ACM)” means any material containing at least one percent (1%) asbestos as determined by polarized light microscopy using the Interim Method of the Determination of Asbestos in Bulk Samples contained in Appendix A of Subpart E in 40 CFR Part 763.]; and,
  - b. Feedstock containing regulated petroleum contaminated soils exceeding Model Toxics Control Act (MTCA) Method A cleanup levels.[Regulatory Basis: ORCAA 8.8]

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<sup>6</sup> Major stationary sources of emissions are existing facilities that emit major quantities of air pollution. Inquire with ORCAA for a listing of existing major stationary sources.

6. **Feedstock Monitoring:** The owner or operator shall implement a written material acceptance policy for imported materials to ensure prohibited materials are not processed through crushing, screening, or grinding. The plan shall be written and available at the crushing site.  
[Regulatory Basis: ORCAA 8.8]
7. **Fugitive Emissions Control:** Reasonable precautions shall be taken as necessary to prevent fugitive emissions. Reasonable precautions shall include, but shall not be limited to, the following:
  - a. Using water spray systems as needed to prevent visible fugitive emissions from rock crushing equipment. Water spray systems shall be sufficient to prevent visible fugitive emissions outside the operating area of the crushing plant.
  - b. Applying water or another ORCAA-approved dust suppressant to non-paved haul roads and access roads to the plant site as needed to prevent visible dust from vehicle haul roads.
  - c. Cleaning or sweeping paved roads within the plant site.
  - d. Taking appropriate measures to prevent the track out of dirt and debris onto public roadways.
  - e. Adopting, posting and enforcing a plant wide speed limit. The speed limit shall be sufficient to prevent visible dust from vehicle haul roads.  
[Regulatory Basis: WAC 173-400-040(8)(a); ORCAA 8.3(c)]
8. **Approval of Stationary Engines:** All rock crushing equipment planned to remain or remaining at a site (pit, quarry or operating site) longer than 12-months must use line power, or must secure a Notice of Construction (NOC) Approval Order for all stationary engines greater than 50 horse power. Approval to operate stationary engines at any site where rock crushing equipment is planned to remain or has remained longer than 12-months must be secured prior to operating rock crushing equipment at the site, and is contingent on meeting approval criteria in ORCAA Rule 6.1.4.  
[Regulatory Basis: ORCAA 6.1.4]
9. **Opacity - Monitoring (Engines):** Visible emissions from exhaust stacks, vents, exits or openings of stationary nonroad engines greater than 20% opacity in any six-minute average period as determined by EPA Method 9, shall trigger prompt (within a week) action to initiate maintenance and/or repair of the engine to eliminate opacity in excess of this action level. Maintenance and repair actions shall be recorded in the maintenance log for the engine and available for inspection when requested.  
[ORCAA 6.1.7(b)(3) and 8.8]
10. **Engine Fuel Requirements:** Stationary nonroad engines shall burn only diesel, biodiesel or a mixture of both provided sulfur content of the fuel does not exceed 15 ppm by weight. Diesel fuel may include biodiesel blends in any proportion.  
[Regulatory Basis: 6.1.7(b)(1)]

11. **Operation and Maintenance Requirements:** The following Operations and Maintenance (O&M) measures are required:
  - a. Inspect water suppression systems monthly to verify water flows properly to discharge spray nozzles or aggregate is wet enough such that water spray is not needed to control fugitive dust. The result of either determination shall be logged per Condition 12. [Regulatory Basis: 40 CFR 60, §60.674(b)]
  - b. Initiate corrective actions within 24 hours and complete corrective action as expediently as practical after finding water is not flowing properly through water spray nozzles. Corrective actions taken shall be logged per Condition 12. [Regulatory Basis: 40 CFR 60, §60.674(b)]
  - c. Transport wheel washing/cleaning sufficient to prevent track-out of dirt and debris on to paved road ways. [Regulatory Basis: ORCAA Rules 8.3d&e]
  - d. Apply water or ORCAA-approved dust suppressant to unpaved roads at a frequency sufficient to prevent visible dust plumes from haul roads. [Regulatory Basis: ORCAA Rules 8.3d&e][General Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  
12. **Required Records:** The following records shall be maintained by the owner or operator at the crushing operation and made available to ORCAA upon request:
  - a. A record of operating locations within ORCAA jurisdiction. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  - b. Record of each inspection of the water spray system, including the date of each inspection and any corrective actions taken. [Regulatory Basis: 40 CFR, §60.676(b)]
  - c. A running log of engine maintenance activities for each stationary nonroad engine. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  - d. Daily log of the hours the plant operated and amount of material crushed in tons. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  - e. Feedstock monitoring records sufficient to demonstrate compliance with condition #6. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  - f. Make, model and model-year of all stationary nonroad engines. [Regulatory Basis: ORCAA 8.11]
  
13. **Annual Production Report:** When requested, the owner or operator shall report to ORCAA the following information:
  - a. The total amount of material crushed by the plant in tons, including RAP and recycled concrete; and,
  - b. The total amount of diesel consumed by the plant including diesel consumed by stationary nonroad engines, but not diesel consumed by mobile equipment.

This information is used to determine total air emissions by the plant for the calendar year.

[Regulatory Basis: ORCAA Rules 8.11 and 3.1(b)]

## 9. Supporting Information

The following attachments include information supporting determinations and conclusions stated above.

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REVIEWED BY Mark V. Goodin, PE

Date







# ATTACHMENTS

- 1. Emissions Calculations - Crushing Plant**
- 2. Emissions Calculations – Engines**
- 3. Emissions Summary**
- 4. Air Dispersion Modeling – Crushing Plant**
- 5. Air Dispersion Modeling – Engines**
- 6. Air Dispersion Modeling – Impacts Calculations**
- 7. Standard Order**



# Attachment 1: Emissions Calculations – Crushing Plant

## Emissions Factors (lbs/ton)

Source	Total PM	Total PM <sub>10</sub>	Total PM <sub>2.5</sub>
Primary Crushing (controlled) (SCC 3-05-020-01)	0.00120	0.00054	0.00010
Secondary Crushing (controlled) (SCC 3-05-020-02)	0.00120	0.00054	0.00010
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.00120	0.00054	0.00010
Screening (controlled) (SCC 3-05-020-02, 03)	0.00220	0.00074	0.00005
Fines Screening (controlled) (SCC 3-05-020-21)	0.00360	0.00220	0.00005
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014	0.00005	0.00001
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	0.00014	0.00002	0.00002
Truck Loading - Conveyor, crushed stone (SCC 3-05-020-32)	0.00014	0.00010	0.00010

1. Emission factors from AP-42 Table 11.19-2-2 (8/04).
2. Fines crushing not included since this isn't typical for the industry in ORCAA's region and since Ecology didn't account for fines crushing in the analysis supporting their general order for rock crushers.
3. Emission factors in purple shaded areas assumed based on the closest fit activity.

# Attachment 1: Emissions Calculations – Crushing Plant

## General Rock Crushing Plant Specifications

Description	Specification	Units
Typical Plant Capacity Assumed	450	tons per hour
Ave Daily Production	3,600	tons per day
Annual Production Limit	1,000,000	tons per year
Crystalline Silica as percent PM <sub>10</sub>	5.58%	% of PM <sub>10</sub>
Mean Vehicle Weight "W" (loaded)	40	tons
Mean Vehicle Weight "W" (unloaded)	20	tons
Mean Haul Truck Capacity	20	tons
Haul road distance (miles)	0.125	miles
Surface Material Silt Content (s in %)	4.8	%
Constant "k" for PM <sub>2.5</sub>	0.15	lbs/VMT
Constant "k" for PM <sub>10</sub>	1.5	lbs/VMT
Constant "a"	0.9	dimensionless
Constant "b"	0.45	dimensionless
Haul Road wet suppression control of dust	75	%
Operating Schedule	8	hours/day
	5	days/wk
	40	wk/year

1. Silt content of haul roads based on AP-42 Table 13.2.2-1 (8/04). Selected mean of "Sand and gravel processing" plant road.
2. Mean Vehicle weight for loaded and unloaded haul trucks for Ecology's General Permit for Rock Crushers, TSD, page 11.
3. Haul road wet suppression dust control efficiency based on Figure 13.2.2-1 in AP-42, section 13.2.2
4. Crystalline Silica percent of PM<sub>2.5</sub> obtained from Journal of the Air & Waste Management Association: John R. Richards, Todd T. Brozell, Charles Rea, Geoff Boraston and John Hayden (2009), PM4 Crystalline Silica Emissions Factors and Ambient Concentrations at Aggregate-Producing Sources in California, Journal of the Air & Waste Management Association, 59:11, 1287-1295, DOI: 10.3155/1047-3289.59.11.1287

## Haul Road Fugitives

Road Type	EF lbs/VMT		
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Unpaved Industrial Road (loaded travel)	2.109	2.109	0.211
<b>Unpaved Industrial Road (Unloaded travel)</b>	1.544	1.544	<b>0.154</b>

Haul road emission factors from AP-42 Section 13.2.2, equation 1a, page 13.2.2-4

## Attachment 1: Emissions Calculations – Crushing Plant

### Particulate Emissions

Activity	PM				PM <sub>10</sub>				PM <sub>2.5</sub>			
	lbs/hr	lbs/day	lb/yr	tons/yr	lbs/hr	lbs/day	lb/yr	tons/yr	lbs/hr	lbs/day	lb/yr	tons/yr
Feedstock Transfer	0.0630	0.5040	140	0.0700	0.0207	0.1656	46	0.0230	0.0059	0.0468	13	0.0065
Initial Screening	0.9900	7.9200	2,200	1.1000	0.3330	2.6640	740	0.3700	0.0225	0.1800	50	0.0250
Primary Crusher	0.5400	4.3200	1,200	0.6000	0.2430	1.9440	540	0.2700	0.0450	0.3600	100	0.0500
Primary Screening	0.9900	7.9200	2,200	1.1000	0.3330	2.6640	740	0.3700	0.0225	0.1800	50	0.0250
Product Transfer	0.0630	0.5040	140	0.0700	0.0207	0.1656	46	0.0230	0.0059	0.0468	13	0.0065
Secondary Crushing	0.5400	4.3200	1,200	0.6000	0.2430	1.9440	540	0.2700	0.0450	0.3600	100	0.0500
Secondary Screening	0.9900	7.9200	2,200	1.1000	0.3330	2.6640	740	0.3700	0.0225	0.1800	50	0.0250
Product Transfer	0.0630	0.5040	140	0.0700	0.0207	0.1656	46	0.0230	0.0059	0.0468	13	0.0065
Tertiary Crushing	0.5400	4.3200	1,200	0.6000	0.2430	1.9440	540	0.2700	0.0450	0.3600	100	0.0500
Fines Screening	1.6200	12.9600	3,600	1.8000	0.9900	7.9200	2,200	1.1000	0.0225	0.1800	50	0.0250
Product Transfer	0.0630	0.5040	140	0.0700	0.0207	0.1656	46	0.0230	0.0059	0.0468	13	0.0065
Truck Loading	0.0630	0.5040	140	0.0700	0.0450	0.3600	100	0.0500	0.0450	0.3600	100	0.0500
Unpaved Roads	2.5690	20.5518	9,651	4.8256	2.5690	20.5518	9,651	4.8256	0.2569	2.0552	965	0.4826
Totals (with haul roads)	9.09	72.75	24,151	12.08	5.41	43.32	15,975	7.99	0.55	4.40	1,617	0.81
Totals (without haul roads)	6.53	52.20	14,500	7.25	2.85	22.77	6,324	3.16	0.29	2.35	652	0.33
Respirable Crystalline Silica (% of PM <sub>2.5</sub> )									0.03	0.25	90	0.05

Haul road emissions reflect control via wet suppression at the control efficiency stated above under specifications.



## Attachment 2: Emissions Calculations – Engines

### Legend

Assumed
Calculated
Design Specification
Parameter/Constant

Operating Parameter		
Design specification	2,000	BHP
Fuel use for 2000 bhp engine @ 100% load <sup>a</sup>	141.9	gal/hr
Fuel use calculated for 2000 bhp engine @ 100% load	103.6	gal/hr
Fuel energy content <sup>b</sup>	137,000	BTU/gal
BHP to kW conversion	0.7457	kW/BHP
BHP limit	2,000	BHP
kW @ 2,000 BHP	1,491	kW
Schedule - hrs/day	8	hrs/day
Schedule - days/wk	5	days/wk
Schedule - wks/yr	40	wks/yr
Max. hours per year	1600	hours / year
Stack height	10	ft
"F" Factor diesel	9190	dscf/MMBtu
O2 Correction Factor	2.07	dimensionless
Exhaust temp (K)	622	K
Exhaust temp (F)	660	F
Ambient temp (K)	293	K
Ambient temp (F)	68	F
% moisture by volume	7.1	%
Stack exhaust rate (dscfm)	4,501	dscfm
Stack exhaust rate (acfm)	10,279	acfm
Fuel sulfur content	0.000015	%S
Average use factor	100.0%	percent
Average Load Factor <sup>d</sup>	43.00%	percent
Stack diameter	8	inches
Ambient Temp	293.15	K
NO <sub>2</sub> to NO <sub>x</sub> ratio <sup>c</sup>	5%	

<sup>a</sup>Fuel rate based on "Diesel Service & Supply" website chart.

<sup>b</sup>Heat content of diesel

<sup>c</sup>NO<sub>2</sub> to NO<sub>x</sub> ratio based on information from Diesel Net Guidance regarding NO<sub>x</sub> emissions from diesel combustion.

<sup>d</sup>Average Load Factor from Tables 9 and 10 in Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling, EPA-420-R-10-016 NR-005d, July 2010

## Attachment 2: Emissions Calculations – Engines

Calculation of dscfm and acfm:

$$\text{Acfm} = (\text{dscfm})(\text{exhaust temp})/[(\text{ambient temp})(1-(\% \text{ moisture by vol}))]$$

Dscfm (dry standard exhaust cubic feet per minute) calculated using U.S. EPA Method 19 “F” factors (An “F” factor is the ratio of combustion gas volumes to heat inputs.)

Where:

1.  $\text{Dscfm} = (\text{fuel use gal/hr})(\text{“F” factor})(\text{O}_2 \text{ correction})(\text{diesel heat content})/(60 \text{ min/hr})$
2.  $\text{Fuel use (gal/hr)} = (7100 \text{ btu/bhp-hr})(1 \text{ gal}/137,000 \text{ btu})(\text{hp})$
3.  $\text{“F” factor} = 9190 \text{ dscf}/1,000,000 \text{ btu}$
4.  $\text{O}_2 \text{ correction} = 20.9/(20.9-10.8)$
5. Load = 100%
6. Diesel heat content = 137,000 btu/gal
7. Exhaust temperature = 622 K
8. % moisture by volume = 7.10%

### Criteria Pollutant Emissions - Engines

Pollutant	Emission Factor <sup>a,b</sup> (lb/hp-hr)	Emission Rate <sup>c</sup> (lb/hr)	Emission Rate <sup>e</sup> (lb/day)	Emission Rate <sup>d</sup> (lb/yr)	Emission Rate (ton/yr)
PM	0.0007	1.40	4.82	963	0.48
PM <sub>10</sub> <sup>f</sup>	0.0007	1.40	4.82	963	0.48
PM <sub>2.5</sub> <sup>g</sup>	0.0007	1.40	4.82	963	0.48
Lead	0.0000	0.00	0.00	0	0.00
NO <sub>x</sub>	0.0130	26.0	89.4	17888	8.94
CO	0.0055	11.00	37.84	7568	3.78
HC	0.0007	1.41	4.85	970	0.49
SO <sub>x</sub>	0.0004	0.81	2.78	557	0.28

<sup>a</sup> PM, CO and HC emissions, emissions factors from Table 3.4-1 of EPA AP-42.

NO<sub>x</sub> emission factor reflects controlled emissions through ignition timing retard. PM, CO and HC emissions uncontrolled.

<sup>b</sup>SO<sub>x</sub> factor from EPA AP-42, section 3.4, Table 3.4-1 using 0.05% sulfur by weight for ULSD.

<sup>c</sup>Emission Rate (lb/hr) = (Emission Factor)\*(horse power rating)

<sup>d</sup>Emission Rate (lb/yr) = (Emission Rate (lb/hr))\*(load factor (%))\*(use factor(%))\*(Maximum hrs/yr)

<sup>e</sup>Emission Rate (lb/day) = (Emission Rate (lb/hr))\*(load factor (%))\*(use factor(%))\*(Maximum hrs/day)

<sup>f</sup>PM<sub>10</sub> emission factor assumed same as PM factor.

<sup>g</sup>PM<sub>2.5</sub> emissions factor assumed the same as PM factor.



## Attachment 3: Emissions Summary

### Hourly Emissions Rate Summary (lbs/hr)

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	NO <sub>x</sub>	CO	HC	SO <sub>x</sub>
Crushing Plant	6.53	2.85	0.29	0.00	0.00	0.00	0.00	0.00
Haul Roads	2.57	2.57	0.26	0.00	0.00	0.00	0.00	0.00
Stationary Nonroad Engines	1.40	1.40	1.40	0.00	26.00	11.00	1.41	0.81
<b>Total</b>	<b>10.49</b>	<b>6.81</b>	<b>1.95</b>	<b>0.00</b>	<b>26.00</b>	<b>11.00</b>	<b>1.41</b>	<b>0.81</b>

### Annual Emissions Summary (tons/yr)

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	NO <sub>x</sub>	CO	HC	SO <sub>x</sub>
Crushing Plant	7.25	3.16	0.33	0.00	0.00	0.00	0.00	0.00
Haul Roads	4.83	4.83	0.48	0.00	0.00	0.00	0.00	0.00
Stationary Nonroad Engines	0.48	0.48	0.48	0.00	8.94	3.78	0.49	0.28
<b>Total</b>	<b>12.56</b>	<b>8.47</b>	<b>1.29</b>	<b>0.00</b>	<b>8.94</b>	<b>3.78</b>	<b>0.49</b>	<b>0.28</b>

### Daily Emissions Summary (lbs/day)

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	NO <sub>x</sub>	CO	HC	SO <sub>x</sub>
Crushing Plant	52.20	22.77	2.35	0.00	0.00	0.00	0.00	0.00
Haul Roads	20.55	20.55	2.06	0.00	0.00	0.00	0.00	0.00
Stationary Nonroad Engines	4.82	4.82	4.82	4.82	89.44	37.84	4.85	2.78
<b>Total</b>	<b>77.57</b>	<b>48.13</b>	<b>9.22</b>	<b>4.82</b>	<b>89.44</b>	<b>37.84</b>	<b>4.85</b>	<b>2.78</b>

### Toxic Air Pollutant Summary

	TAP Emissions Rates			Small Quantity Emissions Rate (WAC 173-460-150)			Modeling Required <sup>6</sup> (yes or no)	HAP?	HAP Sum (tpy)
	(lb/hr) <sup>2</sup>	(lb/day) <sup>3</sup>	(lb/yr) <sup>4</sup>	(lb/hr) <sup>5</sup>	(lb/day) <sup>5</sup>	(lb/yr) <sup>5</sup>			
Crystalline Silica	0.0307	0.25	90.24	NA	0.394	NA	no	NO	N/A

## Attachment 3: Emissions Summary

### Notes for Crushing Plant:

1. Emission factors from AP-42 Table 11.19-2-2 (8/04).
2. Fines crushing not included since this isn't typical for the industry in ORCAA's region and since Ecology didn't account for fines crushing in the analysis supporting their general order for rock crushers.
3. Emission factors in purple shaded areas assumed based on the closest fit activity.
4. Silt content of haul roads based on AP-42 Table 13.2.2-1 (8/04). Selected mean of "Sand and gravel processing" plant road.
5. Mean Vehicle weight for loaded and unloaded haul trucks for Ecology's General Permit for Rock Crushers, TSD, page 11.
6. Haul road wet suppression dust control efficiency based on Figure 13.2.2-1 in AP-42, section 13.2.2
7. Crystalline Silica percent of PM<sub>2.5</sub> obtained from Journal of the Air & Waste Management Association: John R. Richards, Todd T. Brozell, Charles Rea, Geoff Boraston and John Hayden (2009), PM<sub>4</sub> Crystalline Silica Emissions Factors and Ambient Concentrations at Aggregate-Producing Sources in California, Journal of the Air & Waste Management Association, 59:11, 1287-1295, DOI: 10.3155/1047-3289.59.11.1287
8. Haul road emission factors from AP-42 Section 13.2.2, equation 1a, page 13.2.2-4
9. Haul road emissions reflect control via wet suppression at the control efficiency stated above under specifications.

### Notes for Engines:

1. Fuel rate based on specifications sheet for a GENERAC 1125 kW genset (Mitsubishi engine, model # S12R-Y2PTAW-1)
2. NO<sub>2</sub> to NO<sub>x</sub> ratio based on information from Diesel Net Guidance regarding NO<sub>x</sub> emissions from diesel combustion.
3. Average Load Factor from Tables 9 and 10 in Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling, EPA-420-R-10-016 NR-005d, July 2010
4. For PM, NO<sub>x</sub>, CO and HC emissions, factors based on "uncontrolled" EFs from Table 3.4-1 from EPA AP-42.
5. SO<sub>x</sub> factors from EPA AP-42, section 3.4, Table 3.4-1 times 0.05% sulfur by weight for ULSD.
6. Emission Rate (lb/hr) = (Emission Factor)\*(horse power rating)
7. Emission Rate (lb/yr) = (Emission Rate (lb/hr))\*(load factor (%))\*(use factor(%))\*(Maximum hrs/yr)
8. Emission Rate (lb/day) = (Emission Rate (lb/hr))\*(load factor (%))\*(use factor(%))\*(Maximum hrs/day)
9. PM<sub>10</sub> emission factor calculated based on the PM certification standard times a PM<sub>10</sub>/PM ratio based on Table 3.4-2 in AP-42.
10. PM<sub>2.5</sub> emissions factor calculated based on the PM certification standard times a PM<sub>2.5</sub>/PM ratio based on Table 3.4-2 in AP-42.

# Attachment 4: Air Dispersion Modeling – Crushing Plant

## Crusher Modeling Output

AERSCREEN 11076 / AERMOD 1105

09/14/17

10:50:58

TITLE: Portable Temporary Crusher

\*\*\*\*\* VOLUME PARAMETERS \*\*\*\*\*

SOURCE EMISSION RATE: 0.1260 g/s 1.000 lb/hr  
VOLUME HEIGHT: 4.88 meters 16.00 feet  
INITIAL LATERAL DIMENSION: 27.43 meters 90.00 feet  
INITIAL VERTICAL DIMENSION: 10.06 meters 33.00 feet  
RURAL OR URBAN: RURAL  
  
FLAGPOLE RECEPTOR HEIGHT: 1.52 meters 5.00 feet  
  
INITIAL PROBE DISTANCE = 5000. meters 16404. feet

\*\*\*\*\* BUILDING DOWNWASH PARAMETERS \*\*\*\*\*

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

\*\*\*\*\* PROBE ANALYSIS \*\*\*\*\*

25 meter receptor spacing: 46. meters - 5000. meters

Zo	ROUGHNESS	1-HR CONC	DIST	TEMPORAL
SECTOR	LENGTH	(ug/m3)	(m)	PERIOD
1*	0.010	177.8	75.0	WIN

\* = worst case flow sector

\*\*\*\*\* MAKEMET METEOROLOGY PARAMETERS \*\*\*\*\*

MIN/MAX TEMPERATURE: 273.1 / 310.9 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Cultivated Land

DOMINANT CLIMATE TYPE: Average Moisture

DOMINANT SEASON: Winter

ALBEDO: 0.60

BOWEN RATIO: 1.50

ROUGHNESS LENGTH: 0.010 (meters)

## Attachment 4: Air Dispersion Modeling – Crushing Plant

### METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

---

YR MO DY JDY HR

-----  
 10 01 22 22 01

H0 U\* W\* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS

-----  
 -0.15 0.014 -9.000 0.020 -999. 4. 1.7 0.010 1.50 0.60 0.50

HT REF TA HT

-----  
 10.0 273.1 2.0

### METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

---

YR MO DY JDY HR

-----  
 10 01 22 22 01

H0 U\* W\* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS

-----  
 -0.15 0.014 -9.000 0.020 -999. 4. 1.7 0.010 1.50 0.60 0.50

HT REF TA HT

-----  
 10.0 273.1 2.0

---

\*\*\*\*\* AERSCREEN AUTOMATED DISTANCES \*\*\*\*\*  
 OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

---

MAXIMUM DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	MAXIMUM DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
45.72	0.000	2525.00	41.66
50.00	0.000	2550.00	41.35
75.00	177.8	2575.00	41.05
100.00	170.3	2600.00	40.75
125.00	164.1	2625.00	40.46
150.00	158.7	2650.00	40.17
175.00	153.7	2675.00	39.88
200.00	149.3	2700.00	39.60
225.00	145.1	2725.00	39.33
250.00	141.1	2750.00	39.05
275.00	137.4	2775.00	38.78
300.00	133.9	2800.00	38.52
325.00	130.6	2825.00	38.26
350.00	127.4	2850.00	38.00
375.00	124.4	2875.00	37.74
400.00	121.5	2900.00	37.49
425.00	118.7	2925.00	37.24
450.00	116.0	2950.00	37.00

## Attachment 4: Air Dispersion Modeling – Crushing Plant

475.00	113.5	2975.00	36.76
500.00	111.0	3000.00	36.52
525.00	108.7	3025.00	36.29
550.00	106.5	3050.00	36.05
575.00	104.3	3075.00	35.83
600.00	102.2	3100.00	35.60
625.00	100.2	3125.00	35.38
650.00	98.33	3150.00	35.16
675.00	96.50	3175.00	34.94
700.00	94.73	3200.00	34.72
725.00	93.02	3225.00	34.51
750.00	91.38	3250.00	34.30
775.00	89.80	3275.00	34.09
800.00	88.27	3300.00	33.89
825.00	86.80	3325.00	33.69
850.00	85.38	3350.00	33.49
875.00	84.00	3375.00	33.29
900.00	82.67	3400.00	33.09
925.00	81.39	3425.00	32.90
950.00	80.14	3450.00	32.71
975.00	78.94	3475.00	32.52
1000.00	77.77	3500.00	32.34
1025.00	76.64	3525.00	32.15
1050.00	75.54	3550.00	31.97
1075.00	74.48	3575.00	31.79
1100.00	73.45	3600.00	31.61
1125.00	72.44	3625.00	31.43
1150.00	71.47	3650.00	31.26
1175.00	70.52	3675.00	31.09
1200.00	69.60	3700.00	30.92
1225.00	68.70	3725.00	30.75
1250.00	67.83	3750.00	30.58
1275.00	66.98	3775.00	30.42
1300.00	66.16	3800.00	30.25
1325.00	65.35	3825.00	30.09
1350.00	64.57	3850.00	29.93
1375.00	63.80	3875.00	29.77
1400.00	63.06	3900.00	29.62
1425.00	62.33	3925.00	29.46
1450.00	61.62	3950.00	29.31
1475.00	60.93	3975.00	29.16
1500.00	60.25	4000.00	29.01
1525.00	59.59	4025.00	28.86
1550.00	58.94	4050.00	28.71
1575.00	58.31	4075.00	28.56
1600.00	57.69	4100.00	28.42
1625.00	57.09	4125.00	28.28
1650.00	56.50	4150.00	28.13
1675.00	55.92	4175.00	27.99
1700.00	55.36	4200.00	27.85
1725.00	54.80	4225.00	27.72
1750.00	54.26	4250.00	27.58
1775.00	53.73	4275.00	27.44
1800.00	53.21	4300.00	27.31
1825.00	52.70	4325.00	27.18
1850.00	52.20	4350.00	27.05
1875.00	51.71	4375.00	26.92
1900.00	51.23	4400.00	26.79
1925.00	50.76	4425.00	26.66
1950.00	50.30	4450.00	26.53
1975.00	49.85	4475.00	26.41
2000.00	49.40	4500.00	26.28

## Attachment 4: Air Dispersion Modeling – Crushing Plant

2025.00	48.97	4525.00	26.16
2050.00	48.54	4550.00	26.04
2075.00	48.12	4575.00	25.92
2100.00	47.70	4600.00	25.80
2125.00	47.30	4625.00	25.68
2150.00	46.90	4650.00	25.56
2175.00	46.51	4675.00	25.45
2200.00	46.12	4700.00	25.33
2225.00	45.74	4725.00	25.21
2250.00	45.37	4750.00	25.10
2275.00	45.01	4775.00	24.99
2300.00	44.65	4800.00	24.88
2325.00	44.29	4825.00	24.77
2350.00	43.94	4850.00	24.66
2375.00	43.60	4875.00	24.55
2400.00	43.26	4900.00	24.44
2425.00	42.93	4925.00	24.33
2450.00	42.61	4950.00	24.22
2475.00	42.29	4975.00	24.12
2500.00	41.97	5000.00	24.01

\*\*\*\*\* AERSCREEN MAXIMUM IMPACT SUMMARY \*\*\*\*\*

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	183.5	183.5	165.1	110.1	18.35
DISTANCE FROM SOURCE	60.00 meters				
IMPACT AT THE AMBIENT BOUNDARY	0.000	0.000	0.000	0.000	0.000
DISTANCE FROM SOURCE	45.72 meters				







# Attachment 5: Air Dispersion Modeling - Engines

## Engine Modeling Output

AERSCREEN 11076 / AERMOD 1105 09/14/17  
10:35:50

TITLE: Uncertified Nonroad Engine

\*\*\*\*\* STACK PARAMETERS \*\*\*\*\*

SOURCE EMISSION RATE: 0.1260 g/s 1.000 lb/hr  
STACK HEIGHT: 3.05 meters 10.00 feet  
STACK INNER DIAMETER: 0.203 meters 8.00 inches  
PLUME EXIT TEMPERATURE: 622.0 K 660.0 Deg F  
PLUME EXIT VELOCITY: 74.803 m/s 245.42 ft/s  
STACK AIR FLOW RATE: 5140 ACFM  
RURAL OR URBAN: RURAL

FLAGPOLE RECEPTOR HEIGHT: 1.52 meters 5.00 feet

INITIAL PROBE DISTANCE = 5000. meters 16404. feet

\*\*\*\*\* BUILDING DOWNWASH PARAMETERS \*\*\*\*\*

NO BUILDING DOWNWASH HAS BEEN REQUESTED FOR THIS ANALYSIS

\*\*\*\*\* PROBE ANALYSIS \*\*\*\*\*

25 meter receptor spacing: 46. meters - 5000. meters

Zo	ROUGHNESS	1-HR CONC	DIST	TEMPORAL
SECTOR	LENGTH	(ug/m3)	(m)	PERIOD

1*	0.050	68.70	45.7	AUT
----	-------	-------	------	-----

\* = worst case flow sector

\*\*\*\*\* MAKEMET METEOROLOGY PARAMETERS \*\*\*\*\*

MIN/MAX TEMPERATURE: 273.1 / 310.9 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Cultivated Land

DOMINANT CLIMATE TYPE: Average Moisture

DOMINANT SEASON: Autumn

ALBEDO: 0.18

## Attachment 5: Air Dispersion Modeling - Engines

BOWEN RATIO: 0.70  
 ROUGHNESS LENGTH: 0.050 (meters)

### METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

---

YR MO DY JDY HR

-----  
 10 06 18 18 01

H0 U\* W\* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS

-----  
 -40.54 0.748 -9.000 0.020 -999.1487. 985.0 0.050 0.70 0.18 10.00

HT REF TA HT

-----  
 10.0 310.9 2.0

ESTIMATED FINAL PLUME HEIGHT (non-downwash): 12.7 meters

### METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

---

YR MO DY JDY HR

-----  
 10 06 18 18 01

H0 U\* W\* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS

-----  
 -40.54 0.748 -9.000 0.020 -999.1487. 985.0 0.050 0.70 0.18 10.00

HT REF TA HT

-----  
 10.0 310.9 2.0

ESTIMATED FINAL PLUME HEIGHT (non-downwash): 12.7 meters

---

\*\*\*\*\* AERSCREEN AUTOMATED DISTANCES \*\*\*\*\*  
 OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

---

MAXIMUM DIST (m)	1-HR CONC (ug/m3)	MAXIMUM DIST (m)	1-HR CONC (ug/m3)
45.72	68.70	2525.00	2.511
50.00	64.75	2550.00	2.505
75.00	47.28	2575.00	2.502
100.00	38.90	2600.00	2.499
125.00	30.69	2625.00	2.496
150.00	24.45	2650.00	2.492
175.00	20.00	2675.00	2.489
200.00	17.77	2700.00	2.485
225.00	15.81	2725.00	2.481
250.00	14.06	2750.00	2.477
275.00	12.52	2775.00	2.472

## Attachment 5: Air Dispersion Modeling - Engines

300.00	11.19	2800.00	2.468
325.00	10.30	2825.00	2.463
350.00	9.520	2850.00	2.458
375.00	8.810	2875.00	2.453
400.00	8.170	2900.00	2.448
425.00	7.592	2925.00	2.443
450.00	7.072	2950.00	2.437
475.00	6.602	2975.00	2.434
500.00	6.178	3000.00	2.435
525.00	5.794	3025.00	2.435
550.00	5.445	3050.00	2.435
575.00	5.128	3075.00	2.434
600.00	4.870	3100.00	2.434
625.00	4.792	3125.00	2.433
650.00	4.713	3150.00	2.432
675.00	4.635	3175.00	2.431
700.00	4.557	3200.00	2.430
725.00	4.480	3225.00	2.428
750.00	4.404	3250.00	2.427
775.00	4.329	3275.00	2.425
800.00	4.256	3300.00	2.423
825.00	4.185	3325.00	2.421
850.00	4.116	3350.00	2.419
875.00	4.048	3375.00	2.417
900.00	3.982	3400.00	2.415
925.00	3.918	3425.00	2.412
950.00	3.856	3450.00	2.410
975.00	3.795	3475.00	2.407
1000.00	3.736	3500.00	2.404
1025.00	3.679	3525.00	2.401
1050.00	3.624	3550.00	2.398
1075.00	3.570	3575.00	2.395
1100.00	3.518	3600.00	2.392
1125.00	3.467	3625.00	2.388
1150.00	3.418	3650.00	2.385
1175.00	3.370	3675.00	2.381
1200.00	3.324	3700.00	2.377
1225.00	3.285	3725.00	2.374
1250.00	3.256	3750.00	2.370
1275.00	3.227	3775.00	2.366
1300.00	3.198	3800.00	2.362
1325.00	3.170	3825.00	2.358
1350.00	3.142	3850.00	2.354
1375.00	3.114	3875.00	2.350
1400.00	3.086	3900.00	2.345
1425.00	3.059	3925.00	2.341
1450.00	3.033	3950.00	2.337
1475.00	3.006	3975.00	2.332
1500.00	2.980	4000.00	2.328
1525.00	2.954	4025.00	2.323
1550.00	2.929	4050.00	2.319
1575.00	2.904	4075.00	2.314
1600.00	2.880	4100.00	2.309
1625.00	2.855	4125.00	2.305
1650.00	2.831	4150.00	2.300
1675.00	2.808	4175.00	2.295
1700.00	2.785	4200.00	2.290
1725.00	2.778	4225.00	2.285
1750.00	2.775	4250.00	2.280
1775.00	2.772	4275.00	2.275
1800.00	2.769	4300.00	2.270
1825.00	2.765	4325.00	2.265

## Attachment 5: Air Dispersion Modeling - Engines

1850.00	2.760	4350.00	2.260
1875.00	2.755	4375.00	2.255
1900.00	2.749	4400.00	2.250
1925.00	2.743	4425.00	2.244
1950.00	2.736	4450.00	2.239
1975.00	2.729	4475.00	2.234
2000.00	2.722	4500.00	2.229
2025.00	2.714	4525.00	2.223
2050.00	2.706	4550.00	2.218
2075.00	2.698	4575.00	2.213
2100.00	2.689	4600.00	2.207
2125.00	2.680	4625.00	2.202
2150.00	2.671	4650.00	2.197
2175.00	2.661	4675.00	2.191
2200.00	2.652	4700.00	2.186
2225.00	2.642	4725.00	2.180
2250.00	2.632	4750.00	2.175
2275.00	2.621	4775.00	2.169
2300.00	2.611	4800.00	2.164
2325.00	2.600	4825.00	2.158
2350.00	2.590	4850.00	2.153
2375.00	2.579	4875.00	2.148
2400.00	2.568	4900.00	2.144
2425.00	2.557	4925.00	2.141
2450.00	2.545	4950.00	2.137
2475.00	2.534	4975.00	2.134
2500.00	2.523	5000.00	2.130

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 \*\*\*\*\* AERSCREEN MAXIMUM IMPACT SUMMARY \*\*\*\*\*  
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	MAXIMUM 1-HOUR CALCULATION PROCEDURE	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	68.70	68.70	61.83	41.22	6.870

DISTANCE FROM SOURCE      45.72 meters

IMPACT AT THE AMBIENT BOUNDARY	68.70	68.70	61.83	41.22	6.870
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DISTANCE FROM SOURCE      45.72 meters





## Attachment 6: Air Dispersion Modeling – Impacts Calculations

### Boundary Impacts - Engines<sup>5</sup>

(Tier 1)

Pollutant	Emissions Rates (Maximum per time period)			Average Emissions Rates (lbs/hr) per time period			Model Results <sup>2</sup> (ug/m3)				
	lb/hr	lb/day	lb/yr	hourly ave	daily ave	annual ave	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave
PM <sub>10</sub>	1.40	4.82	963.20	1.40	0.20	0.11	<b>0.01</b>	<b>0.17</b>	2.09	2.68	2.98
PM <sub>2.5</sub>	1.40	4.82	963.20	1.40	0.20	0.11	<b>0.01</b>	<b>0.17</b>	2.09	2.68	2.98
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0.00	0.00	0.00
NO <sub>2</sub> <sup>2</sup>	1.30	4.47	894.40	1.30	0.19	0.10	<b>0.01</b>	0.16	1.94	2.49	2.77
CO	11.00	37.84	7568.00	11.00	1.58	0.86	0.09	1.34	<b>16.40</b>	21.09	<b>23.43</b>
VOC	1.41	4.85	970.08	1.41	0.20	0.11	0.01	0.17	2.10	2.70	3.00
SO <sub>2</sub>	0.81	2.78	556.59	0.81	0.12	0.06	<b>0.01</b>	<b>0.10</b>	1.21	<b>1.55</b>	<b>1.72</b>

### Boundary Impacts - Crushing

Plant<sup>5</sup>

Pollutant	Emissions Rates (Maximum per time period)			Average Emissions Rates (lbs/hr) per time period			Model Results <sup>2</sup> (ug/m3)				
	lb/hr	lb/day	lb/yr	hourly ave	daily ave	annual ave	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave
PM <sub>10</sub>	2.85	22.77	6324.00	2.85	0.95	0.72	<b>0.08</b>	<b>0.81</b>	4.24	5.46	6.06
PM <sub>2.5</sub>	0.29	2.35	652.00	0.29	0.10	0.07	<b>0.01</b>	<b>0.08</b>	0.44	0.56	0.62
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0.00	0.00	0.00
NO <sub>2</sub> <sup>2</sup>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0.00	<b>0.00</b>
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SO <sub>2</sub>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	<b>0.00</b>	0.00	<b>0.00</b>	<b>0.00</b>

## Attachment 6: Air Dispersion Modeling – Impacts Calculations

### Test 1 - Contribute to Ambient Violation?

Pollutant	Model Results <sup>2</sup> (ug/m3)					WAC 173-400-113(3) levels (ug/m3)					
	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave	
PM <sub>10</sub>	0.09	0.98	6.33	8.14	9.04	1	5	NA	NA	NA	Pass
PM <sub>2.5</sub>	0.02	0.25	2.52	3.25	3.61	0.3	1.2	NA	NA	NA	Pass
Lead	0.00	0.00	0.00	0.00	0.00	NA	0.0833	NA	NA	NA	Pass
NO <sub>2</sub> <sup>2</sup>	0.01	0.16	1.94	2.49	2.77	1	NA	NA	NA	NA	Pass
CO	0.09	1.34	16.40	21.09	23.43	NA	NA	500	NA	2000	Pass
VOC	0.01	0.17	2.10	2.70	3.00	NA	NA	NA	NA	NA	NA
SO <sub>2</sub>	0.01	0.10	1.21	1.55	1.72	1	5	NA	25	30	Pass

### Maximum Impacts - Engines<sup>6</sup>

(Tier 1)

Pollutant	Emissions Rates (Maximum per time period)			Average Emissions Rates (lbs/hr) per time period			Model Results <sup>2</sup> (ug/m3)				
	lb/hr	lb/day	lb/yr	hourly ave	daily ave	annual ave	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave
PM <sub>10</sub>	1.40	4.82	963.20	1.40	0.20	0.11	0.38	6	67	87	96
PM <sub>2.5</sub>	1.40	4.82	963.20	1.40	0.20	0.11	0.38	6	67	87	96
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
NO <sub>2</sub> <sup>2</sup>	1.30	4.47	894.40	1.30	0.19	0.10	0.35	5	63	80	89
CO	11.00	37.84	7568.00	11.00	1.58	0.86	2.97	43	529	680	756
VOC	1.41	4.85	970.08	1.41	0.20	0.11	0.38	6	68	87	97
SO <sub>2</sub>	0.81	2.78	556.59	0.81	0.12	0.06	0.22	3	39	50	56



## Attachment 6: Air Dispersion Modeling – Impacts Calculations

### Maximum Impacts - Crushing Plant<sup>6</sup>

Pollutant	Emissions Rates (Maximum per time period)			Average Emissions Rates (lbs/hr) per time period			Model Results <sup>2</sup> (ug/m3)				
	lb/hr	lb/day	lb/yr	hourly ave	daily ave	annual ave	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave
PM <sub>10</sub>	2.85	22.77	6324.00	2.85	0.95	0.72	<b>6.43</b>	<b>68</b>	355	456	507
PM <sub>2.5</sub>	0.29	2.35	652.00	0.29	0.10	0.07	<b>0.66</b>	<b>7</b>	37	47	52
Lead	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0	0	0	<b>0</b>
NO <sub>2</sub> <sup>2</sup>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0	0	0	<b>0</b>
CO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	<b>0</b>	0	<b>0</b>
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
SO <sub>2</sub>	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	<b>0</b>	0	<b>0</b>	<b>0</b>

### Cumulative Impacts

Pollutant	Impacts of Crushing Plant + Engines (ug/m3)					Background Ambient Concentrations <sup>7</sup>				
	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave
PM <sub>10</sub>	6.80	<b>73.05</b>	421.91	542.46	602.73	NA	<b>32.00</b>	NA	NA	NA
PM <sub>2.5</sub>	<b>1.04</b>	<b>12.48</b>	103.88	133.56	148.41	<b>5.40</b>	<b>18.00</b>	NA	NA	NA
Lead	0.00	<b>0.00</b>	0.00	0.00	0.00	NA	<b>0.00</b>	NA	NA	NA
NO <sub>2</sub> <sup>2</sup>	<b>0.35</b>	5.12	62.52	80.38	<b>89.31</b>	<b>10.90</b>	NA	NA	NA	<b>86.48</b>
CO	2.97	43.33	<b>528.99</b>	680.13	<b>755.70</b>	NA	NA	<b>902.00</b>	NA	<b>1418.66</b>
VOC	0.38	5.55	67.81	87.18	96.87	NA	NA	NA	NA	NA
SO <sub>2</sub>	<b>0.22</b>	<b>3.19</b>	38.90	<b>50.02</b>	<b>55.58</b>	<b>2.36</b>	<b>4.19</b>	NA	<b>15.20</b>	<b>22.79</b>

## Attachment 6: Air Dispersion Modeling – Impacts Calculations

### Test 2 - Cause an Ambient Violation?

Pollutant	Impacts of Crushing Plant + Engines + Background (ug/m3)					Applicable Federal and State Ambient Air Quality Standards					
	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave	annual ave	daily ave	8-hr ave	3-hr ave	hourly ave	
PM <sub>10</sub>	NA	105	NA	NA	NA	NA	150	NA	NA	NA	Pass
PM <sub>2.5</sub>	6	30.5	NA	NA	NA	12	35.0	NA	NA	NA	Pass
Lead	NA	0.00	NA	NA	NA	NA	0.15	NA	NA	NA	Pass
NO <sub>2</sub> <sup>2</sup>	11.25	NA	NA	NA	176	100	NA	NA	NA	188	Pass
CO	NA	NA	1431	NA	2174	NA	NA	10,000	NA	40,000	Pass
VOC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO <sub>2</sub>	2.58	7	NA	50	56	52	367	NA	1,300	196	Pass

### Toxic Air Pollutants Modeling Analysis

Pollutant	Hourly Rate <sup>1</sup> (hourly average)	Hourly Rate <sup>1</sup> (daily average)	Hourly Rate <sup>1</sup> (annual average)	Modeled Concentration <sup>2</sup> (ug/m <sup>3</sup> )	ASIL <sup>3</sup> (ug/m <sup>3</sup> )	ave period	Pass (y/n)	Conclusion
Silica (crystalline, Respirable) <sup>4</sup>	N/A	0.01	N/A	0.73	3.00	24-hr	yes	Pass

### Notes for all Tables in Attachment 5:

- Emission rates used to scale modeling results reflect average emissions over averaging period and are based on an assumed operating schedule.
- Model impacts at point of maximum impact. Results(ug/m3) =modeling results from AIRSCREEN @1 lb/hr times average hourly rate for that averaging period
- The ASIL for each pollutant is defined in Chapter 173-460 of the Washington Administrative Code
- Respirable Crystalline Silica based on the percentage of Crystalline Silica in aggregate times PM<sub>2.5</sub>
- Boundary impacts are used to estimate potential impacts on the nearest "Non-Attainment" area and are based on modeled impacts at 5,000 meters from the plant (~3 miles).
- Maximum impacts reflect the maximum impacts from the crushing plant plus the maximum impacts from engines, even though maximum impacts may not coincide specially.
- PM<sub>10</sub> background concentration based on NW Airquest design values for 2009-2011 for Thurston County.
- PM<sub>2.5</sub> background concentrations based on NW Airquest design values for 2009-2011 for Thurston County .
- NO<sub>2</sub>, SO<sub>2</sub> and CO background concentrations based on NW Airquest design values for 2009-2011 for Thurston County.







## ORDER OF APPROVAL NOTICE OF CONSTRUCTION <App #> ISSUED TO <Name>

This Order of Approval (“Order”) is issued in accordance with Olympic Region Clean Air Agency (“ORCAA”) Regulations and Chapter 173-400 of the Washington Administrative Code.

Conditional approval to install and operate a general rock crushing plant (“Approved Equipment”) at <Location> (“Approved Location”) for operation solely as described in the associated Notice of Construction (“NOC”) application No. <App #>, is hereby GRANTED to <Name> (“Applicant”), subject to the Conditions of Approval listed below.

This Order and the Conditions of Approval herein remain in effect for the life of the Approved Equipment as used at the Approved Location and shall be binding on Applicant, current owners and operators of the equipment, and Applicant’s heirs, successors and assigns unless amended or superseded by a subsequent Order issued by ORCAA or unless the equipment is permanently shut down. The Applicant must notify any subsequent owner, operator, heirs, successor or assigns of this Order and the Conditions of Approval herein. Conditions of Approval established in this Order shall be enforceable in addition to any applicable state, local and federal regulations or standards in existence now or in the future. Compliance with the conditions of this Order do not relieve the Applicant or any owner or operator from compliance with ORCAA Regulations, Chapter 70.94 Revised Code of Washington (RCW), or any other emissions control requirements, nor from any penalties for failure to comply with the same. Applicant may appeal this Order to the Pollution Control Hearings Board (“PCHB”) by filing a written appeal with the PCHB and serving a copy upon ORCAA within thirty (30) days of receipt of this Order.

### **This Order is GRANTED, subject to the following Conditions of Approval:**

1. **Rock Crushing Plant:** <Name> is approved to operate a rock crushing plant consisting of equipment listed in the following table, in accordance with this Order of Approval (Order), at qualifying locations within the jurisdiction of Olympic Region Clean Air Agency (ORCAA), which includes Clallam, Grays Harbor, Jefferson, Mason, Pacific and Thurston counties. This Order approves operation of the rock crushing plant at any single qualifying site at any given time and allows the plant to be relocated to qualifying locations provided a record of operating locations is maintained per condition #12. This Order imposes requirements for equipment comprising the rock crushing plant only: Not equipment or operations associated with aggregate mining.

EQUIPMENT	TYPE	AIR POLLUTION CONTROL	CAPACITY & PRODUCTION LIMITS
Crushers	Any	Water spray applied throughout plant at locations where fugitive dust generated remains airborne.	Plant-site production limited to no more than: <ul style="list-style-type: none"> <li>• 5,400 tons of material processed per day (annual average)</li> <li>• 1,000,000 tons per year.</li> </ul>
Ancillary Equipment	Screens Scalpers Grizzlies Conveyors		
Stationary Nonroad Engines <sup>1</sup>	Diesel	Ultra-low-sulfur diesel	Cumulative capacity of stationary nonroad engines not exceeding 2000 brake horsepower (bhp)

[Regulatory Basis: ORCAA 6.1.2(l)]

2. **Annual Registration:** The owner shall register the rock crushing plant with ORCAA annually and pay annual registration fees.  
[Regulatory Basis: ORCAA 4.1]
  
3. **Approved Locations:** The rock crushing plant may be sited and operated at any of the following qualifying locations, provided the location is not part of an existing major stationary source<sup>2</sup> of emissions, plant-site daily production does not exceed 5,400 tons per day (annual average), and minimum distance buffers prescribed in Condition 4 are met:
  - a. Registered surface mining sites with a current Sand and Gravel permit issued by the Washington Department of Ecology;
  - b. Sites located in proximity to and in support of government road construction projects;
  - c. Landfills; and,
  - d. Any site with current approval, by the city or county agency with jurisdiction, to conduct aggregate crushing operations.
[Regulatory Basis: ORCAA 6.1.4]
  
4. **Minimum Distance Buffers:** The rock crusher must be located a minimum of 150 feet from any property line and 500 feet from any residence, occupied commercial building, school, hospital, nursing home or other sensitive receptor. Exceptions may be granted by ORCAA, following a site-specific review of air impacts prior to relocating the rock crusher to any location that does not conform to the stated buffers.  
[Regulatory Basis: ORCAA 6.1.4]

<sup>1</sup> Stationary Nonroad engines include engines powering generators, screens, conveyors, grinders and any other equipment that remain stationary when operating. Engines powering mobile equipment such as haul trucks loaders, excavators and other equipment that move when operating are not regulated by ORCAA.

<sup>2</sup> Major stationary sources of emissions are existing facilities that emit major quantities of air pollution. Inquire with ORCAA for a listing of existing major stationary sources.

5. **Prohibited Material:** The following feedstocks shall not be processed through either crushing, grinding or screening:
  - a. Presumed Asbestos Containing Material (PACM) or any feedstock contaminated with any percentage of PACM as follows:
    - i. For purposes of this condition, “Presumed Asbestos Containing Material (PACM)” means any soft concrete, roofing material, thermal system insulation and surfacing material found in a building;
    - ii. PACM may be rebutted provided it is tested and determined not to be Asbestos Containing Material (ACM);
    - iii. “Asbestos Containing Material (ACM)” means any material containing at least one percent (1%) asbestos as determined by polarized light microscopy using the Interim Method of the Determination of Asbestos in Bulk Samples contained in Appendix A of Subpart E in 40 CFR Part 763.]; and,
  - b. Feedstock containing regulated petroleum contaminated soils exceeding Model Toxics Control Act (MTCA) Method A cleanup levels.  
[Regulatory Basis: ORCAA 8.8]
6. **Feedstock Monitoring:** The owner or operator shall implement a written material acceptance policy for imported materials to ensure prohibited materials are not processed through crushing, screening, or grinding. The plan shall be written and available at the crushing site.  
[Regulatory Basis: ORCAA 8.8]
7. **Fugitive Emissions Control:** Reasonable precautions shall be taken as necessary to prevent fugitive emissions. Reasonable precautions shall include, but shall not be limited to, the following:
  - a. Using water spray systems as needed to prevent visible fugitive emissions from rock crushing equipment. Water spray systems shall be sufficient to prevent visible fugitive emissions outside the operating area of the crushing plant.
  - b. Applying water or another ORCAA-approved dust suppressant to non-paved haul roads and access roads to the plant site as needed to prevent visible dust from vehicle haul roads.
  - c. Cleaning or sweeping paved roads within the plant site.
  - d. Taking appropriate measures to prevent the track out of dirt and debris onto public roadways.
  - e. Adopting, posting and enforcing a plant wide speed limit. The speed limit shall be sufficient to prevent visible dust from vehicle haul roads.  
[Regulatory Basis: WAC 173-400-040(8)(a); ORCAA 8.3(c)]
8. **Approval of Stationary Engines:** All rock crushing equipment planned to remain or remaining at a site (pit, quarry or operating site) longer than 12-months must use line power, or must secure a Notice of Construction (NOC) Approval Order for all stationary engines greater than 50 horse power. Approval to operate stationary engines at any site where rock crushing equipment is planned to remain or has remained longer than 12-

months must be secured prior to operating rock crushing equipment at the site, and is contingent on meeting approval criteria in ORCAA Rule 6.1.4.  
[Regulatory Basis: ORCAA 6.1.4]

9. **Opacity - Monitoring (Engines):** Visible emissions from exhaust stacks, vents, exits or openings of stationary nonroad engines greater than 20% opacity in any six-minute average period as determined by EPA Method 9, shall trigger prompt (within a week) action to initiate maintenance and/or repair of the engine to eliminate opacity in excess of this action level. Maintenance and repair actions shall be recorded in the maintenance log for the engine and available for inspection when requested.  
[ORCAA 6.1.7(b)(3) and 8.8]
  
10. **Engine Fuel Requirements:** Stationary nonroad engines shall burn only diesel, biodiesel or a mixture of both provided sulfur content of the fuel does not exceed 15 ppm by weight. Diesel fuel may include biodiesel blends in any proportion.  
[Regulatory Basis: 6.1.7(b)(1)]
  
11. **Operation and Maintenance Requirements:** The following Operations and Maintenance (O&M) measures are required:
  - a. Inspect water suppression systems monthly to verify water flows properly to discharge spray nozzles or aggregate is wet enough such that water spray is not needed to control fugitive dust. The result of either determination shall be logged per Condition 12. [Regulatory Basis: 40 CFR 60, §60.674(b)]
  - b. Initiate corrective actions within 24 hours and complete corrective action as expediently as practical after finding water is not flowing properly through water spray nozzles. Corrective actions taken shall be logged per Condition 12.  
[Regulatory Basis: 40 CFR 60, §60.674(b)]
  - c. Transport wheel washing/cleaning sufficient to prevent track-out of dirt and debris on to paved road ways. [Regulatory Basis: ORCAA Rules 8.3d&e]
  - d. Apply water or ORCAA-approved dust suppressant to unpaved roads at a frequency sufficient to prevent visible dust plumes from haul roads. [Regulatory Basis: ORCAA Rules 8.3d&e]

[General Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  
12. **Required Records:** The following records shall be maintained by the owner or operator at the crushing operation and made available to ORCAA upon request:
  - a. A record of operating locations within ORCAA jurisdiction. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  - b. Record of each inspection of the water spray system, including the date of each inspection and any corrective actions taken. [Regulatory Basis: 40 CFR, §60.676(b)]
  - c. A running log of engine maintenance activities for each stationary nonroad engine. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
  - d. Daily log of the hours the plant operated and amount of material crushed in tons. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]



- e. Feedstock monitoring records sufficient to demonstrate compliance with condition #6. [Regulatory Basis: ORCAA Rules 4.3(g) and 8.8]
- f. Make, model and model-year of all stationary nonroad engines.  
[Regulatory Basis: ORCAA 8.11]

13. **Annual Production Report:** When requested, the owner or operator shall report to ORCAA the following information:
- a. The total amount of material crushed by the plant in tons, including RAP and recycled concrete; and,
  - b. The total amount of diesel consumed by the plant including diesel consumed by stationary nonroad engines, but not diesel consumed by mobile equipment.
- This information is used to determine total air emissions by the plant for the calendar year.  
[Regulatory Basis: ORCAA Rules 8.11 and 3.1(b)]

**PREPARED & REVIEWED BY: Mark V. Goodin, PE**



