Eastside Rock Products
Raging River Quarry
32715 Carmichael Rd
Fall City, WA 98024

EASTSIDE ROCK PRODUCTS

ERP NOISE MANAGEMENT PLAN

REGULATORY COMPLIANCE

The Raging River Quarry and surrounding properties are located in unincorporated King County and are subject to the noise limits outlined in Chapter 12.86 of the King County Code (KCC 12.86).

KCC 12.86 establishes "maximum permissible" sound levels based on the district (i.e., zoning) of the noise source and the receiving properties. The quarry is zoned "M" for Mining and is considered an Industrial district. The surrounding properties are zoned for rural residential use (RA-10) and are considered Rural Districts.

The maximum permissible sound levels originating from Industrial District and entering Rural Districts are 57db(A) based on the energy-average sound level over a given time period, or "Leq", and 72db(A) based on the Lmax or maximum sound level. The policies and procedures outlined by this plan/policy meet or exceed the following regulatory standards:

KING COUNTY CODE AND PERMIT CONDITIONS

Clearing and Grading Conditions

CG-27: *The operation shall comply with KCC 21A.22.070.A.1, which requires compliance with the noise standards in KCC chapter 12.86.*

CG-28: *Maximum hours of operation are as follows:*

a. 7:00 a.m. to 7:00 p.m. Monday through Friday; provided, however, loading of the trucks shall be restricted to the hours of 7:30 am to 4 pm.

b. 8:00 am to 4:30 pm Saturday; provided, however, that activity on Saturdays shall be restricted to maintenance of equipment.

CG-29: *Crushing and drilling shall not be conducted concurrently at any location on the site until a comprehensive noise study, approved by DPER, demonstrates that concurrent operations can be conducted in compliance with permissible sound levels in KCC 12.86.*

CG-30: *The only work that may be conducted at an elevation of greater than 150 feet above of quarry production floor is rock drilling and excavation for stripping overburden until a comprehensive noise study, approved by DPER, demonstrates that other quarry operations can operate above elevation 150 in compliance with permissible sound levels in KCC 12.86.*

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CG-31: *Prior to initiating full operations at the site, the permittee shall demonstrate compliance with the permissible sound levels as established in Title 12.*

CG-32: *Berms, solid fencing, and landscaping on both sides of the Carmichael Road, from the intersection of the Preston-Fall City Road to the quarry office and scale, shall be maintained to the satisfaction of DPER as necessary to reasonably mitigate noise and visual impacts of the quarry, as they affect persons traveling on the Preston-Fall City Road and adjacent and nearby residents.*

CG-33: *The applicant shall construct and/or maintain rock berms or acoustical walls around the rock crusher, screener, and other similar types of stationary and semi-stationary noise producers. Said berms or walls shall be included in the noise comprehensive noise plan and constructed to the satisfaction of DPER.*

CG-34: *DPER shall have the authority to require monitoring devices to be located on or adjacent to the site to assure compliance with King County noise regulations. The permittee shall reimburse the County for all costs incurred to conduct independent noise monitoring.*

CG-35: *The permittee shall provide notification to DPER for and must receive prior approval from DPER for any mining-related activities above an elevation of 150 feet.*

CG-36: *In the event that noise occurs in excess of the allowed levels, the operators shall cease operations that are causing the excessive noise until measures are implemented to correct the violation. Failure to implement corrective measures in a timely fashion may result in the imposition of a Stop Work Order and, if necessary, other enforcement measures.*

Relevant King County Code

KCC 21A.22.070.A.1: *Noise levels produced by a mineral extraction or materials processing operation shall not exceed levels specified by K.C.C. chapter 12.86*

KCC 21A.22.070.B.1.a: *Airblast levels shall not exceed one hundred thirty-three decibels measured by a two Hz or lower flat response system at the nearest residential property or place of public assembly*

KCC 12.86.110:

> *A. For purposes of this subsection, sound levels shall be measured by a Type 1 or Type 2 sound level meter. Sound level measurements shall be based on the Leq during the measurement interval, using a minimum measurement interval of one minute for a constant sound source or a thirty-minute measurement for a noncontinuous sound source. For sound sources located within unincorporated King County, the maximum permissible sound levels are as follows:*

EASTSIDE ROCK PRODUCTS

	Receiving Property District			
	Rural	*Residential*	*Commercial*	*Industrial*
Sound Source District				
Rural	*49 dB(A)*	*52 dB(A)*	*55 dB(A)*	*57 dB(A)*
Residential	*52 dB(A)*	*55 dB(A)*	*57 dB(A)*	*60 dB(A)*
Commercial	*55 dB(A)*	*57 dB(A)*	*60 dB(A)*	*65 dB(A)*
Industrial	*57 dB(A)*	*60 dB(A)*	*65 dB(A)*	*70 dB(A)*

B. During a measurement interval, Lmax may exceed the sound level limits of this section by no more than 15 db(A). For the purposes of this subsection, "Lmax" means the maximum sound over a measurement interval determined by using a sound level meter set to "fast" response time.

POTENTIAL NOISE SOURCES

In order to reduce noise traveling towards neighboring properties, the quarry has been designed to have truck loading and processing operations occurring at the lowest elevations (similar to an amphitheater) with noise attenuation berms and topography buffering noise between surrounding properties. Operating activities at the Raging River Quarry can be divided into four primary groups, and potential noise sources have been identified for each operating activity grouping.

Crushing and Material Processing

- Jaw Crusher
- Screening Plant
- Cone Crusher
- Transfer Points, Conveyors, and Discharges

Sales and Loading

- Truck Loading

Drilling and Blasting

- Drilling Blast Holes
- Blasting

Material Excavation

- Stripping Overburden
- Digging, Bailing, and Feeding Blasted Material
- Rock Breaking with Hydraulic Hammer Attachment

Mitigation policies and best management practices are outlined by operational group for each potential noise source in the following sections. In the event that any operations are shown to exceed permissible noise levels, such operations will cease until such time as compliance can be established through noise testing procedures outlined in the Noise Monitoring Protocol established herein.

CRUSHING AND MATERIAL PROCESSING

All elements of crushing and processing operations create potential noise sources within the quarry. Each major component of crushing and processing is listed below along with existing noise mitigation strategies and additional potential future strategies.

Jaw Crusher

Noise Sources

- The placement of feedstock (3 man boulders down to sand) into the feeder of the Jaw Crusher.
- In the jaw crushing chamber, as feed material is reduced in size to 8" minus.

Noise Mitigation Strategies

- Stack of interlocking cargo containers positioned to the northwest of the Jaw Crusher to create a sound wall deflecting noise away from nearby receiving properties
- Rubber apron pads to reduce rocks banging against metal feeder apron
- Loader operator training to reduce vertical drop from loader bucket into the feeder

Screening Plant

Noise Sources

- Discharge from conveyor onto top deck of screening plant
- Screen decks as material travels across the decks and is separated by size
- Discharge chutes, where presorted material is sent to product piles or to the Cone Crusher

Noise Mitigation Strategies

- Stack of interlocking cargo containers positioned to the northwest of the screening plant to create a sound wall deflecting noise away from nearby receiving properties
- Rubber screens at the discharge point where feed from the conveyor lands on the top deck of the screening plant
- Rubber lined flex mats screens in screen decks
- Full plywood enclosure around the screening plant with acoustical sound absorptive paneling lining the interior of the enclosure
- Rubberized padding on metal discharge chutes

Cone Crusher

Noise Sources

- Discharge from feed conveyor onto cone crusher cross conveyor
- Screen decks as material travels across the decks and is separated by size
- Cone crushing chamber

Noise Mitigation Strategies

- Rubberized chute and padding from discharge conveyor onto cone crusher cross conveyor
- Stack of interlocking cargo containers positioned to the northwest of the Cone Crusher to create a sound wall deflecting noise away from nearby receiving properties
- Rubber lined flex mats screens in screen decks
- Full plywood enclosure around the cone crusher with acoustical sound absorptive paneling lining the interior of the enclosure

Transfer Points, Conveyors and Discharges

Noise Sources

- Discharge from product conveyors into product piles
- Transfer points between conveyors

Noise Mitigation Strategies

- Rubber padding between conveyor transfer points
- Rubber belting on all conveyors
- Operator training to maintain maximum product pile heights to reduced vertical drop of product into piles

Additional Potential Mitigation Strategies

- Moving processing components within the quarry
- Adding more Sound Walls
- Adding fully rubberized screens to screening decks
- Adding an enclosure around the jaw crusher with acoustical paneling
- Lining enclosures with denser exterior materials

SALES AND LOADING

Truck loading can be a potential noise source particularly when loading coarse products such as quarry spalls. Truck traffic entering and leaving the quarry is also a potential noise source for receiving properties located near the entrance of the quarry.

Truck Loading

Noise Sources

- The placement of sales products (particularly quarry spalls) into the beds of customer trucks.

Noise Mitigation Strategies

- Double stack of interlocking cargo containers positioned to the northwest of the product loading area
- Loader operator training to reduce vertical drop from loader bucket into truck beds

Haul Traffic

Noise Sources

- Incoming and outgoing traffic on Carmichael Road.

Noise Mitigation Strategies

- Acoustical berms lining Carmichael Road
- Fencing lining Carmichael Road
- Paving of Carmichael Road between the Preston Fall City Road and the quarry scale house

Additional Potential Mitigation Strategies

- Adding more Sound Walls
- Reposition product loading area
- Add loading bins capable of reducing vertical drop of product into truck beds
- Add acoustical paneling or denser material to existing fencing

DRILLING AND BLASTING

Drilling and Blasting activities are potential noise sources. Eastside Rock Products does not currently perform Drilling or Blasting operations in-house, and instead hires third party subcontractors. Potential noise sources and the corresponding mitigation and prevention procedures are outlined below:

Drilling

Noise Sources

- Drill bit boring into rock
- Drill exhaust and engine

Noise Mitigation Strategies

- Subcontracted driller selection utilizing experienced best in class contractors with modern drill fleet, quality operators, ability to modify drills and fabricate noise mitigation solutions
- Drill selection utilizing smaller diameter drills and lower horsepower engines
- Drill orientation placing cab between nearby receiving properties and drill mast
- Metal and absorptive sound paneling lined drill sheath attached to drill mast
- Use of movable sound barrier

Blasting

Noise Sources

- Detonation of blasting explosives

Noise Mitigation Strategies

- Limiting volume of material generated by blast and/or size of blast
- Limiting powder factors
- Use of delays in shot design
- Use of high quality stemming materials

Additional Potential Mitigation Strategies

- Using down the hole style drill as opposed to hammer drill
- Additional sheathing around drill mast
- Adding enclosure around drill engine
- Modifying blast design

MATERIAL EXCAVATION

All phases of Material Excavation present potential noise sources. Each major activity included under Material Excavation operations and the corresponding mitigation and prevention procedures are outlined below:

Stripping of Overburden

Noise Sources

- Excavator digging and piling overburden

Noise Mitigation Strategies

- Positioning the excavator behind safety berms on benches to block noise in the direction of nearby receiving properties
- Rigorous equipment maintenance scheduling to prevent bucket wobbling, track squeaking, etc.
- Excavator operator training to maximize digging efficiency which reduces operating hours and to minimize bucket wobbling
- Use of movable sound barrier

Digging, Bailing, and Sorting Blasted Material

Noise Sources

- Excavator digging, bailing and sorting material

Noise Mitigation Strategies

- Positioning the excavator behind safety berms on benches to block noise in the direction of nearby receiving properties
- Rigorous equipment maintenance scheduling to prevent bucket wobbling, track squeaking, etc.
- Excavator operator training to maximize digging, bailing and sorting efficiency which reduces operating hours
- Excavator operator training to minimize bucket impact noise from digging and using thumb
- Separating large material from fines to minimize vertical distance large material falls when being bailed
- Use of movable sound barrier

Rock Breaking with Hydraulic Hammer Attachment

Noise Sources

- Excavator with Hydraulic Hammer Attachment Breaking large boulders

Noise Mitigation Strategies

- Positioning the excavator at the quarry floor with optimal shielding from quarry topography when using the Hydraulic Hammer attachment
- Excavator operator training to maximize rock breaking efficiency to reduce operating hours
- Stockpiling large boulders to minimize the distance the excavator must move
- Breaking boulders to maximum size that can be accommodated by the jaw crusher
- Utilizing shot design to minimize large boulders that require breaking
- Use of movable sound barrier

Additional Potential Mitigation Strategies

- Utilizing larger excavators to reduce the number of bucket loads required to move material
- Reorienting benches and faces to run north to south to direct noise away from nearby receiving properties to the northwest
- Modifying blast design to generate finer blast material

Eastside Rock Products has worked in concert with qualified third party noise consultants to develop the following Noise Testing Protocol which will be used for establishing ongoing compliance with King County Code (Ongoing Site Compliance Testing), and establishing compliance, as necessary, for operating activities or combinations thereof that are currently prohibited within the quarry (Specific Operations Testing).

Applicable Regulations

The site and surrounding properties are located in unincorporated King County and are subject to the noise limits outlined in Chapter 12.86 of the King County Code (KCC 12.86).

KCC 12.86 establishes "maximum permissible" sound levels based on the district (i.e., zoning) of the noise source and the receiving properties. The quarry is zoned "M" for Mining and is considered an Industrial district. The surrounding properties are zoned for rural residential use (RA-10) and are considered Rural Districts. The applicable noise limits for noise sources located in Industrial Districts are displayed in **Table 1**.

Table 1. King County Maximum Permissible Sound Levels (dBA)

District of Sound Source	District of Receiving Property Within King County			
	Rural Day/Night	Residential Day/Night	Commercial	Industrial
Industrial	57 / 47	60 / 50	65	70

The limitations for noise received in Rural and Residential Districts are reduced by 10 dBA between 10 PM and 7 AM weekdays and between 10 PM and 9 AM weekends.

Source: KCC 12.86.110

The sound level limits identified in **Table 1** are based on the energy-average sound level over a given time period, or "Leq". In addition, the sound level cannot exceed a level 15 dBA higher than the levels displayed in **Table 1**, represented by the Lmax or maximum sound level. KCC 12.86.110(A) states that sound level measurements shall be taken for a minimum of one-minute for "constant" sound sources (i.e., sources that emit a constant sound that would not change over a given time period), and a minimum of thirty minutes for "non-continuous" sound sources (i.e., sources that are not continuous over a given time period). Given the varying nature of quarry noise, the appropriate time interval for the measurement would be a minimum period of thirty minutes.

Instrumentation

Sound levels shall be measured using Class I or Class II (previously referred to as Type 1 or Type 2) sound level meters. Class 1 meters are generally considered to be accurate within +/- 1 dBA while Class 2 meters are generally considered to be accurate within +/- 2 dBA. The microphone of each sound level meter will be mounted on a tripod at a height of approximately 5 feet above ground, and the microphone will be fitted with an acoustically neutral windscreen. The sound level meter will be calibrated immediately before the measurements begin, and the meter must have been factory calibrated and certified within the previous 12 months. The meter will be set to a Fast response and A-weighting.

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Locations

Sound levels shall be measured at two locations representing the adjacent properties to the quarry site. The locations are expected to be the following:

- **Location 1** – on the south-eastern boundary of parcel number 222407-9107 (formerly known as the the McClain property) and the Raging River Quarry property parcel number 222407-9011
- **Location 2** – on the northern boundary of parcel number 222407-9110 (the Shimmel property), near the log pile on parcel number 222407-9108 (the Trisko property)

These locations represent the most-affected portions of the most-affected adjacent properties and represent the closest points between the quarry and adjacent residences. Sound levels of quarry operations at other properties in the vicinity of the quarry are expected to be similar to or lower than the levels at these chosen measurement locations.

In the event that noise related complaints arise from other nearby residences in different directions than Location 1 and 2, additional testing locations can be added on a temporary basis to ensure that sound levels at these point are in compliance and are equal to or lower than observed levels at Location 1 and 2.

Duration of Measurements

Ongoing Site Compliance Testing will occur for a minimum of 4 consecutive hours between the hours of 8 AM and 4 PM during periods of peak operational activity within the quarry. The parameters for testing specific operations or combinations thereof (Specific Operations Testing) will be designed and submitted to KCDPER for review and approval prior to commencing testing. Interim spot tests, if needed, may vary in length but are expected to last two hours or less.

Measurement Procedures

Sound levels will be measured in 1-second intervals, recording both the 1-second L_{eq} and L_{max}. If sound level contributions from discrete, transitory noise sources not associated with the quarry (such as aircraft, birds, loud traffic, etc.) are identified after review of recorded audio taken during the measurement, these extraneous noises will be removed from the measurement data prior to calculating the final interval L_{eq} and L_{max} levels attributable to the quarry.

Reporting

Testing events shall be documented in a brief report summarizing the overall results and describing:

- instrumentation used in the measurements
- measurement locations
- measurement times and durations
- the calculated L_{eq} and the L_{max} levels during each hourly interval representing both the overall sound levels and the levels with extraneous sources removed
- a description of the noise sources contributing to the measurements
- a description of the meteorology during the measurement period, including estimated temperature and wind conditions
- a description of equipment operating during the time of measurement
- a description and timeline of operational activities occurring during the time of measurement
- the elevation at which equipment and operational activities occurred at
- a description of any additional mitigation measures implemented since the previous monitoring event

Reports shall compare the measurements with the environmental noise limits established by the County. Reports shall be submitted to King County within ten calendar days of each measurement event.

Response to Non-Compliant Conditions

If violations of the County noise limits are measured, the quarry shall cease the activity causing the issue and identify and implement noise mitigation measures to reduce sound levels. Follow-up spot test(s) will be conducted, and the non-compliant activity will not be allowed to continue until compliance has been demonstrated.

Qualified Noise Consultant

Ramboll Environ (RE) has been retained to measure sound levels in the site vicinity as described above and to prepare reports required by this program. Kristen Wallace, who will be directing the monitoring efforts for Ramboll, has more than 20 years of experience conducting similar monitoring events in King County and the surrounding region. Ms. Wallace has also worked with and for King County numerous times in preparing environmental noise impact assessments and noise monitoring plans for similar facilities. Eastside Rock Products may elect to retain and use different qualified noise consultants at its discretion.

NOISE MONITORING PROGRAM

In concert with its Noise Monitoring Protocol, Eastside Rock Products has developed the following Noise Monitoring Program for the purpose of ensuring ongoing compliance with King County Code and site specific noise related grading permit conditions.

Ongoing Site Compliance Testing

Ongoing Site Compliance Testing will be conducted by a third party qualified Noise Consultant and will be conducted in accordance with the approved Noise Testing Protocol established above.

Following approval of this Noise Management Plan, Ongoing Site Compliance Testing will be conducted a minimum of once every four months. In the event that three consecutive Ongoing Site Compliance Testing events occur, and the site is shown to be fully in compliance during each testing event, Ongoing Site Compliance Testing will be required a minimum of once every six months. In the event that a non-compliant Ongoing Site Compliance Testing event occurs, the frequency of Ongoing Site Compliance Testing will revert to once every 4 months until such time as three consecutive fully compliant Ongoing Site Compliance Testing events are recorded.

Specific Operations Testing

Any Specific Operations Testing that may be required to initiate new operational activities, existing operations at varying elevations, or any combinations thereof will be conducted by a third party qualified Noise Consultant and will be conducted in accordance with the approved Noise Testing Protocol established above. Eastside Rock Products will work in concert with its Qualified Noise Consultant to design a customized Specific Operations Testing Protocol for submittal and approval to KCDPER prior to initiating any Specific Operations Testing.