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August 14, 2017

Eastside Rock Products, Inc.
32715 Carmichael Road
Fall City, Washington 98024

Attention: Ian Mooney, Plant Supervisor

Subject: Slope Evaluation Revised Summary Letter
Raging River Quarry 32715 Carmichael Road
Fall City, Washington
File No. 22534-001-01

GeoEngineers, Inc. (GeoEngineers) is pleased to present our evaluation of site conditions and our recommendations for site stabilization and operations procedures as requested by King County for the Raging River Quarry. The site is located along 32715 Carmichael Road in Fall City, Washington as shown in Figure 1. This letter is provided in accordance with our authorized scope of services dated August 4, 2017 and addresses review comments received from Eastside Rock Products on August 11, 2017.

The site includes an area identified by John Priebe and described by King County Engineer Joseph Barto from an email dated August 2, 2017 relative to a blasting shot on July 27, 2017. We understand that the shot apparently had the unintended consequence of dislodging blast debris to the east toward the area outside of the permitted mining area below Elevation 300. Joseph noted in his email that the shot did not transport materials into the 200-foot buffer for the Raging River, however it did waste/dislodge materials downslope below Elevation 300 that impacted vegetation.

In that regard Joseph indicated that, "Prior to anymore blasting, a geotechnical evaluation needs to be completed to assess the cause of the slope failure, evaluate the stability of the debris that has been discharged onto the slope and what measures need to be done to clean up and/or stabilize the debris, and recommendations to ensure this action does not happen again."

OBSERVATIONS AND REVIEW

We completed a site visit to observe the quarry and blast area on August 3, 2017. We first met on site with property owner John Priebe, and Blake Araki and Ian Mooney of Eastside Rock Products, Inc. (Eastside Rock Products). John provided map relative to the 300-foot elevation based on Light Detection and Ranging (LiDAR) data. He informed us that adding that the actual 300-foot elevation had been flagged on site, but might actually be lower on the slope than the flagging indicated. John indicated that blasting information

could also be provided. Blake commented that blasting subcontractor likely exceeded the intent of the most recent shot dated July 27, 2017.

We completed our site reconnaissance with Ian walking up the slope to the quarry from the Quarry Office and Scale area to the west as shown in Figure 2. Our descriptions below are divided into 1) slopes downslope of the 300-foot elevation flagging; 2) slopes upslope of the 300-foot elevation flagging; and 3) areas within the quarry affected by the July 27 shot.

Slopes Downslope of 300-foot Elevation

The native slope is planar and includes trees that range from 12- to 30-inch-diameter breast height with Douglas fir and cedar trees that are generally in a straight, vertical growth position. The slope below the 300-foot elevation typically ranges from 60 to locally over 70 percent. There are scattered boulder sized quarry-rocks and gravel and cobble sized deposits that were inadvertently dislodged from previous quarry operations. The debris deposited prior to the July 27 shot was distinguishable because ground-cover has grown around and over the deposits.

We also observed the area impacted by the July 27 shot. We observed blast debris that has apparently mobilized toward the toe of the slope as shown in Figure 2. In general, the debris includes sand, gravel, cobble and boulder sized fragments that are deposited onto the slope that is locally steeper than 70 percent. A number of conifer trees were knocked over by the blast debris. Two large blast debris angular blocks of rock were greater than 6 feet in diameter.

Slopes Upslope of 300-foot Elevation

The area upslope of this flagging includes tailings/waste/fill soils in placed by Eastside Rock Products in May 2017 (Figure 2). The tailings consist of loose sand, silt and gravel (glacial gravel deposits) from overburden that appeared to have been locally compacted with an excavator bucket on the face and near the top of the slope. In other places, the fill soils appeared to have been end-dumped and were in a loose, uncompacted condition. The fill gradients exceed 70 percent locally. The thickness of the fill soils upslope of the 300-foot elevation ranges from approximately 5 to greater than 20 feet locally.

We also observe exposed in-place blocks of bedrock overhanging the area that was impacted by blast debris deposition. We could not closely evaluate the blocks because slope was too steep to safely traverse, however the block protruded approximately 3 feet from the face of the slope.

Review and Observations from Area of July 27, 2017 Shot

We observed a drilled blast hole as close as 10 feet from the break-in-slope to the east where the oversteepended fill soils are located. The exact location of the shots is not clear from the blast report and we observed no other drill holes.

CONCLUSIONS AND RECOMMENDATIONS

It is our opinion that blasting activities on July 27, 2017 were too close to the face of the slope. It is also or opinion that the oversteepened fill soils are at risk of erosion and potential failure during the upcoming wet season. Prior to the wet season (October 1) we recommend that Eastside:

1. Reduce the slope gradient of the tailings/waste/fill soils upslope of Elevation 300 to a 2 Horizontal :1 Vertical (50 percent) slope. Alternatively, a steeper slope could be designed with a mechanically stabilize earth (MSE) wall that includes a series of compacted lifts built up with a geo-grid or other equivalent material, and a coir fabric facing. This would require laboratory testing of the tailings/waste/fill soils for appropriate engineering design of the MSE wall.
2. During the regrade of the oversteepened fill recommended above, we also recommend removal of loose debris (gravel, cobble and boulder size debris) that can be safely retrieved by an excavator from the area up and downslope of Elevation 300 to reduce the risk of instability.
3. The areas downslope of Elevation 300 that are impacted can be replanted with appropriate tree and ground cover to reduce long the risk of term erosion impacts from the affected area.

Based on our direct observations at the site and on our review of blasting documentation prepared by others, it is our opinion that the quarry blasting activities can resume if the following recommendation are implemented:

1. Two overhanging logs that protrude over the approximate area of the blast debris should be removed to reduce the risk of the trees sliding downslope and impacting areas downslope of the 300-foot elevation.
2. Have the blasting subconsultant design a proper charge that will not destabilize the slope to the east. Some measures that could be considered in this regard include:
    a. Complete blasting farther west than the previous July 27, 2017 shot.
    b. Design the blast with the site geometry in mind to avoid mobilizing fill material on the east side of the quarry.
    c. Complete pre-splitting and trim blasting to reduce the size of the material that is potentially dislodged.
    d. Increase the number of drilled holes to dissipate energy for more effectively.
    e. Reduce the blasting loads or reduce hole depth.

LIMITATIONS

We have prepared this report for the exclusive use of the Eastside Rock Products and their authorized agents for the Raging River Quarry in Fall City, Washington.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices for construction observation in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments should be considered a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

We trust this letter meets your current needs and provides the necessary information for project acceptance. Please call if you have any question regarding the contents of this letter.

Sincerely,
GeoEngineers, Inc.

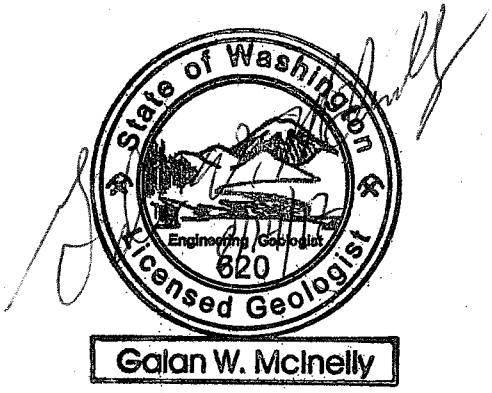
Elson T. Barnett, LG, LEG
Project Manager

Galan W. McInelly, LG, LHG, LEG
Principal

ETB:GWM:cam

Attachments:
Figure 1. Vicinity Map
Figure 2. Excavation Plan

1 copy submitted



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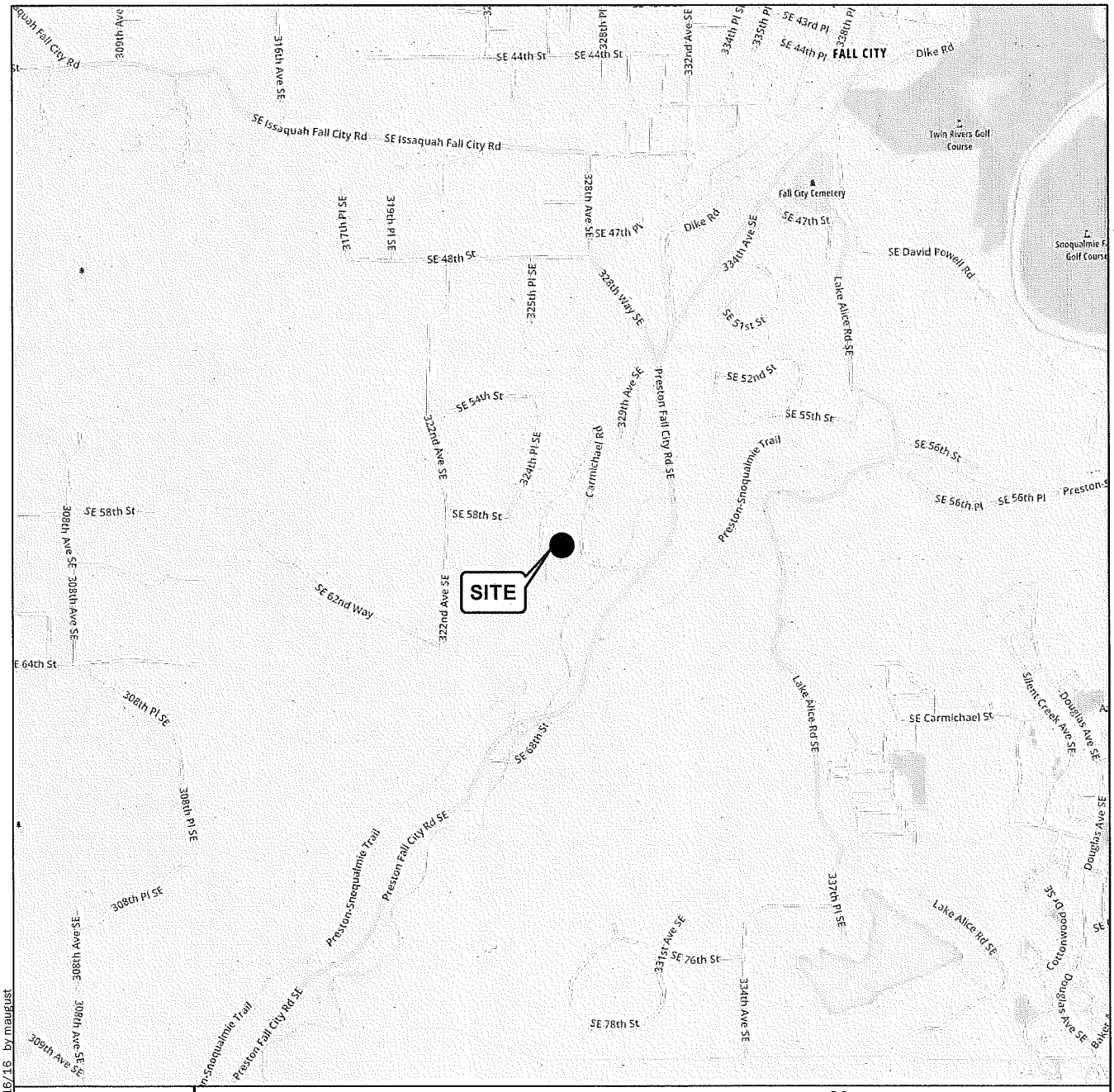

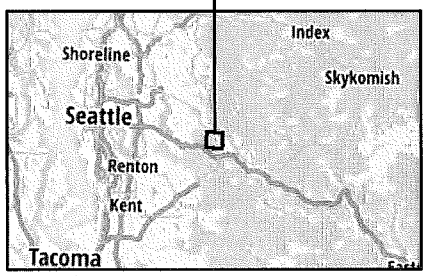

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Feet

Vicinity Map

Raging River Quarry
Location

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Figure 1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

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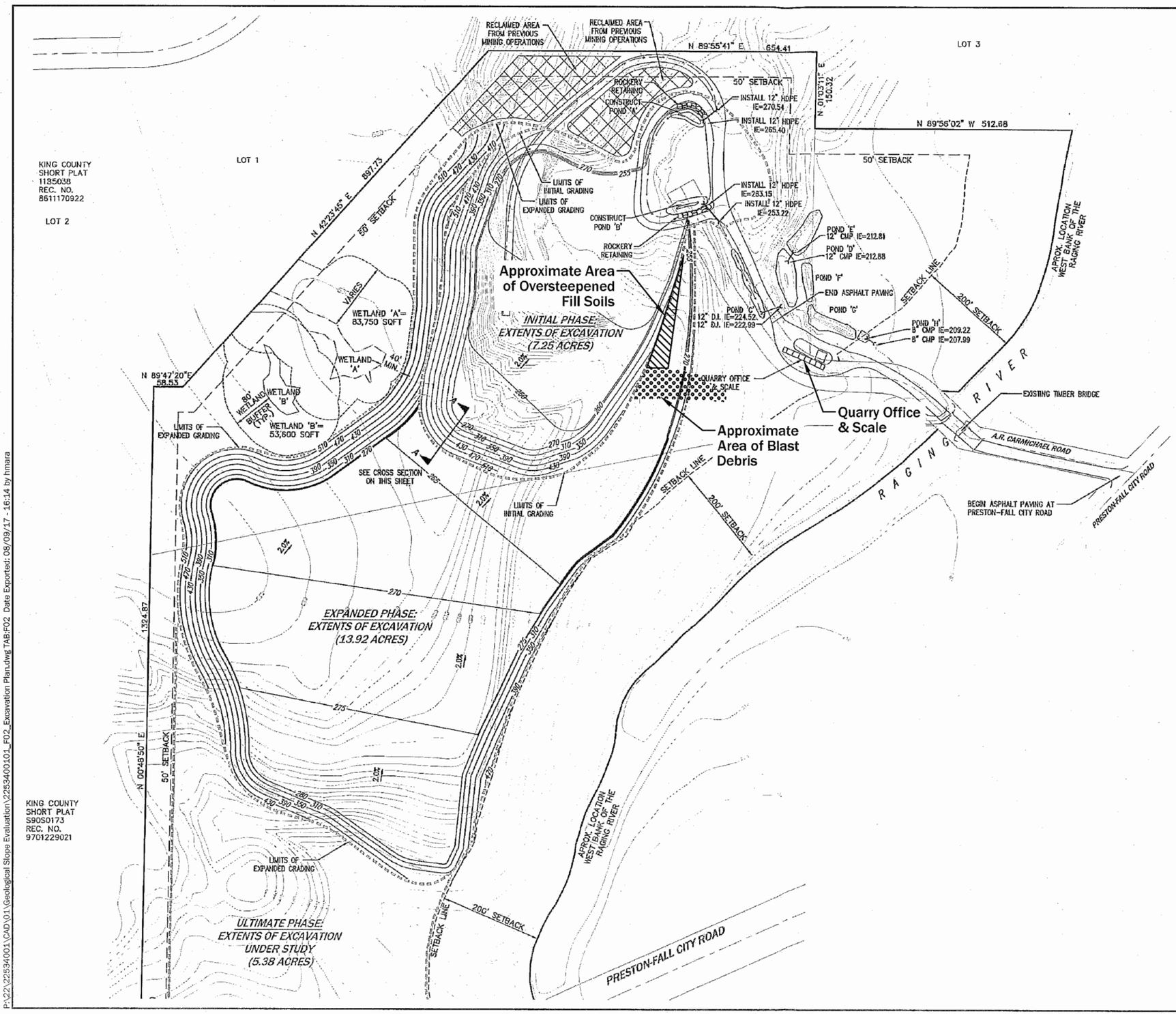

Legend

- Oversteepend Fill Soils
- Blast Debris

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Data Source: PDF "Excavation Plan" by Core Design, Inc. dated 07/2015.

Projection: NAD83 WA State Planes, North Zone, US Foot

N W E S

200 0 200
Feet

Excavation Plan

Raging River Quarry
Fall City, Washington

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Figure 2

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