

**CONDITIONAL USE PERMIT APPLICATION
SKAMANIA QUARRY**

APPLICANT:

J.L. Storedahl and Sons, Inc.

Application Contact:

Bo Storedahl
(360) 636-2420

Mailing Address:

2233 Talley Way
Kelso, WA, 98626

Project Location:

Sections 17, 18, 19 & 30
Township 2N, Range 6E, Willamette Meridian
Skamania County, Washington

August 20, 2021

**Skamania County Community Development Department
Conditional Use Application**

Prepared by:

NV5
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Wilsonville, OR 97070
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Project: Storedahl-12-01

1.0 INTRODUCTION

On behalf of J.L. Storedahl and Sons, Inc. (Storedahl, or Applicant), NV5 has prepared this Conditional Use Permit (CUP) application for the proposed Skamania Quarry project, submitted to the Skamania County Community Development Department (County). The purpose of this project is to establish a surface mining operation for the extraction, processing, and production of aggregate resources. This application is intended to satisfy the project description and conditional use criteria as outlined on the County's application form. This CUP application includes the following figures and appendices:

- Figure 1 – Vicinity Map
- Figure 2 – Property Ownership Map
- Figure 3 – Existing Topography Map
- Figure 4 – Reclamation Sequence Map
- Figure 5 – Final Topography Map
- Figure 6 – Cross Sections
- Appendix A – State Environmental Policy Act (SEPA) Environmental Checklist
- Appendix B – Geotechnical Assessment prepared by NV5, dated August 17, 2021
- Appendix C – Transportation Impact Study prepared by DKS, dated February 19, 2020
- Appendix D – Sound Analysis prepared by BRC Acoustics & Audiovisual Design, dated September 9, 2020

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 SITE LOCATION

The site is located in unincorporated Skamania County approximately 10.5 miles northeast of Washougal, Washington and 3.5 miles northeast of the community of Skamania in Sections 17, 18, 19 and 30 within Township 2 North, Range 6 East of the Willamette Meridian. The site is accessed off McCloskey Creek Road via Mabee Mines Road and State Highway 14. The site location is indicated on Figure 1. Tax lot numbers and ownership of the site and surrounding properties are indicated on Figure 2. The site is bordered by timberlands under private and public ownership around most of its perimeter, and commercial timberlands comprise much of the land use in the surrounding area. A part of the eastern boundary is also bordered by federal lands of the Columbia River Gorge National Scenic Area (CRGNSA), and additional CRGNSA lands are located further east and south of the site. Several rural residences occupy an area further southwest of the site. The Bonneville Power Administration (BPA) has an easement for their power-line alignment running approximately east to west that is adjacent to the southern boundary of the proposed project area. The subject property is currently zoned as West End Commercial Resource Lands 40 (WE-CRL40).

2.2 BACKGROUND AND SITE CONDITIONS

The site has been historically used as commercial timberlands with multiple timber rotations being harvested. A small bedrock quarry is located in the southern site and has been used to produce aggregate for timber road construction and access on the property by Weyerhaeuser Company (Weyerhaeuser). The majority of the site was most recently logged in phases from 2013 to 2016 and has been subsequently replanted. After consultation with Weyerhaeuser's

resource division, Storedahl completed a series of due-diligence subsurface explorations in 2016 and 2018. These explorations determined that a significant quantity of high-quality aggregate resource was present at the site. Pending state and County approval of the proposed mine project, Storedahl plans to lease the mineral rights of the property from Weyerhaeuser to operate a crushed aggregate quarry until the completion of the mining operations on the property. Thereafter, the mine site will be reclaimed back to forestry use.

3.0 MINING

Consideration of the site as a potential aggregate resource was initially based on the quality of rock observed in the timber pit, located at the southern end of the proposed mine area, as seen in the aerial photo in Figure 2. Since the due-diligence explorations undertaken in 2016 and 2018, NV5 has worked in concert with Weyerhaeuser and Storedahl to develop a mine plan for the site that minimizes environmental impacts associated with mining activity, demonstrates adherence to state and local ordinance, and maximizes the economic value of the site.

3.1 MINE DESIGN GOALS

Mining is considered to be a temporary activity by Washington State, insofar as the site must be returned to an approved subsequent use compatible with the surrounding area's land use or site zoning. Reclamation of the site to forestry use is the ultimate goal of the project, and all proposed activities on site have been designed to have minimal short- and long-term effects on the environmental health of the property and its vicinity. The proposed mine has been planned to follow applicable sections of Skamania County Code (SCC) Chapter 19, as well as requirements of the Washington Department of Natural Resources (DNR) and the Washington Department of Ecology (DOE).

3.2 MINE PLAN

Proposed site activities will include drilling, blasting, loading, hauling, crushing, screening, stockpiling, and commercial sales of crushed aggregate. The project will include a small operations and storage area, as well as the improvement and maintenance of an access road along the BPA easement to the southwest (see Figure 2). The proposed permit boundary for the site includes approximately 273.6 acres, of which approximately 180 acres will be disturbed by mineral extraction and other mining disturbance. Existing topography is shown on Figure 3, the mining and reclamation sequence map is shown on Figure 4, and the final topography map is shown on Figure 5. Mineral extraction will be divided into two segments: mine segment 1, at the north end of the site, with an approximate area of 140.4 acres, and mine segment 2, with an approximate area of 8.8 acres. Mining is anticipated to occur over the next 30 to 40 years and will involve the removal of approximately 24 million cubic yards of resource material, overburden and topsoil.

Prior to the start of mining activities, topsoil will be removed from the area of immediate operation; stockpiled in berms adjacent to the workings, in the central storage area, or intermittently on other portions of the site (see Figure 4); and promptly stabilized with vegetation and/or mulch. Mining of the bedrock will advance as an incised excavation into the project area from the top of the ridge downward, with benched slopes equivalent to a 2 horizontal to 1 vertical (2H:1V) slope gradient. Controlled blasting into relatively unweathered basalt bedrock

will be the primary means of rock extraction, and its frequency will be determined by market demand. Crushing and screening operations will be conducted at an operations area near the center of the site. The maximum depth of planned mining is approximately 240 feet below ground surface (BGS) to an elevation as low as 2,050 feet above mean sea level (MSL).

Proposed hours of operation are from 7 a.m. to 4:30 p.m. for commercial traffic. The site will likely have a staff between 5 to 10 employees depending on the season and market conditions. Employees may arrive approximately a half-hour before and stay for up to an hour after normal business hours to prepare for business and conduct closure and maintenance activities.

Proposed mining activities are planned to be at least 100 feet from mapped streams and 300 feet from mapped wetlands, as shown on Figures 4 and 5, corresponding to the maximum buffers described in SCC Section 19.05.040 and Section 19.03.040, respectively. As required by the DOE, Best Management Practices (BMPs) outlined in the Stormwater Management Manual for Western Washington will be used in stormwater design for the site. Appropriate grading and drainage measures will be utilized to ensure that stormwater generated on site is directed as much as possible into the mining disturbance and infiltrated into the floor of the mine areas. The stormwater management plan for the site will be designed to manage a 25-year, 24-hour precipitation event. Further discussion of environmental impacts of the mine and their proposed mitigation can be found in the Washington State Environmental Policy Act (SEPA) Checklist presented in Appendix A.

Mine plans have also been designed to avoid and/or mitigate potential geologically hazardous areas on site. A small, shallow landslide is mapped on the western boundary of the site by DNR, and its presence was confirmed by field reconnaissance in April 2021. Based on our observations of local geology and slide geometry, a 50-foot buffer area has been placed around the head scarp of the slide for all proposed site disturbances. Additional compliance with SCC Chapter 19.07, discussion and documenting of hazard areas on site, and proposals for mitigation in the context of the mine project can be found in the Geotechnical Assessment presented in Appendix B.

Access to the project is proposed along Kellet Road off of McCloskey Creek Road, which is a service road used by BPA to access its easement. Several residences also use this road to access properties located adjacent to the easement. An agreement to improve this roadway and use it for mine-related traffic has been coordinated with the BPA. As mine traffic could have a potential impact on residents and local industry, a detailed traffic study was completed for the site and is presented in Appendix C. This study outlines probable traffic volumes into and out of the site, likely routes, and the effect on the local road system and intersections. The findings of the report are discussed under Section 4 below.

3.3 RECLAMATION PLAN

Upon the completion of mining the site will be reclaimed back to commercial forestry use. A detailed reclamation plan will be developed to fulfill requirements of the site's Surface Mining Reclamation Permit, overseen and approved by the DNR. As part of this requirement, a bond for the reclamation cost of the mine, subject to periodic update and revision, will be required by the DNR for the lifetime of the mine. Current reclamation plans for the site involve a segmented

mine plan and the stockpiling of topsoil and overburden during mining operations. As the resource is exhausted, overburden and topsoil will be re-distributed within the mine excavations to create a more natural topographic appearance and facilitate reforestation. The disturbed area will be replanted with native species to return the property to use as commercial timberlands.

Depending on the amount of overburden soil and possible non-resource bedrock that is encountered during mining, excess non-resource material may be used to create backfill slopes against the completed mine slopes or to backfill the mine floor of the extraction areas. Backfill slopes will be created in accordance with a backfill plan required by the DNR. Topsoil will be separated from non-resource material in this process, so the topsoil is available to place as a final lift and provide rooting medium for subsequent revegetation and reclamation back to commercial forestry.

4.0 CONDITIONAL USE CRITERIA

As part of the CUP application for the proposed project, answers to the conditional use criteria as outlined in the County's Conditional Use Application informational packet are addressed below.

- 1. Be either compatible with other uses in the surrounding area or is no more incompatible than are other outright permitted uses in the applicable zoning district;***

The site is currently zoned as West End Commercial Resource Lands 40 (WE-CRL40). According to SCC Section 21.67.100, this zone is intended to designate and protect forest, agricultural, and mineral resource lands of long-term significance. This includes consideration of the commercial extraction of minerals. Forest practices and extraction of rock for forestry purposes are outright permitted uses in this zone. Stone quarrying, mining, crushing, stockpiling and similar uses for the commercial development of mineral resources are listed as conditional uses in WE-CRL40. The minimum lot size must be forty acres, and no dwelling units are allowed in this zone.

The proposed project is compatible with the underlying zoning and with the lands adjacent to the project, which are also zoned WE-CRL40 except those in the CRGNSA. The primary use of this zone is development of natural resources, which has included multiple rotations of commercial timber and rock extraction to support these developments, including a small bedrock quarry located on the site. The proposed project will develop the same aggregate resource as a commercial operation, providing mineral resource of long-term significance to the local economy. The estimated lifetime of the mine, contingent on market demand, is approximately 30 to 40 years. As part of operational requirements by the DNR, a detailed reclamation plan will be implemented as mine segments are exhausted until the end of mining, whereupon the area will be reclaimed, revegetated, and returned to its previous use as commercial timberlands. Compatibility with isolated residences located further southwest of the site, and with existing industry (forestry) and general commerce in the area, are addressed in subsequent Questions 2 and 3.

2. Not materially endanger the health, safety and welfare of the surrounding community to an extent greater than that associated with other permitted uses in the applicable zoning district;

Mine operations will not pose a safety hazard nor have a significant effect on the health and welfare of the surrounding community. The mine will be located in a remote, resource-oriented location that has produced commercial timber for many years with accessory operation of a small bedrock quarry. The remoteness of the site and locking gates limiting site access will prevent the mine from posing a safety hazard to the surrounding community. McCloskey Creek Road and Mabee Mines Road already serve as primary corridors for timber hauling from the commercial timberland located in the site vicinity down to State Highway 14. Traffic from the mine will be of similar size and length to the timber trucks.

The SEPA Checklist included in Appendix A discusses a variety of environmental concerns with respect to the proposed project, which consider a wide range of potential health and welfare concerns. The principal potential concerns to the surrounding community are discussed below including erosion, runoff, slope stability, noise, and traffic (note that traffic is discussed under Question 3).

Erosion

Removal of vegetation, excavation of soil and rock, and stockpiling of materials on-site could potentially contribute to local erosion of soils within the project area. Soil erosion from mining-related disturbance will be minimized by incrementally removing and storing topsoil and overburden directly in advance of mineral extraction activity. Removed topsoil will be stored in perimeter berms around the mine excavation and intermittently on other portions of the site as mining progresses over the extraction area. Soil berms and stockpiles will be seeded and/or mulched to stabilize the soils from possible erosion. Stormwater will be directed inward into the mining disturbance to infiltration basins located in the mine floor as mining progresses across the excavation segments.

Additional Best Management Practices (BMPs) will be used to wet drive surfaces, prevent release of fugitive dust from the site, capture and control possible road runoff, and other methods to prevent erosion from transporting soil offsite. All of these mitigation efforts will be in accordance with the Surface Mine Reclamation Permit required by the DNR and other permits.

Runoff

Stormwater runoff from the site area could potentially impact sedimentation and turbidity of local streams, drainages, and wetlands. The uncontrolled release of fuel or lubricants used by mining equipment could also adversely impact local water quality. The mine will be required to apply for a Sand and Gravel General Permit overseen by the DOE. This permit will require the development of a detailed Site Management Plan – including an Erosion and Sediment Control Plan, Stormwater Pollution Prevention Plan, Spill Control Plan, and Monitoring Plan. These plans will collectively designate required BMPs for management and disposal of on-site stormwater and prevention and control of spills to avoid impacting adjacent lands and off-site critical areas.

Slope Stability

Based on geologic hazard mapping completed by the DNR, a small area at the west-central portion of the site is mapped as an interpreted landslide, as shown on Figures 3 through 5. DNR has also mapped a large, deep seated landslide complex located east of the project. In accordance with SCC Chapter 19.07, a Geotechnical Assessment was completed to address the potential geologic hazards that could be impacted by the project (Appendix B). Based on the findings, it is our opinion that the proposed mineral extraction and related earthwork activities will not exacerbate existing areas of slope instability on the site or its surrounds, nor will planned cut and fill sections onsite result in a likelihood for slope failure. No additional geotechnical studies are recommended. Slope stability concerns are discussed in greater detail in the Geotechnical Assessment report.

Noise

Mining and associated activities will generate intermittent daytime noise during normal site operations and brief intervals of noise from blasting. The nearest residential receptor to noise generated on site is located approximately 0.5 mile away from the closest proposed disturbance area within the permit boundary and approximately 0.75 mile from the proposed processing and storage area at the center of site. To assess the effect of mine-generated sound on the surrounding community, the applicant commissioned a Sound Analysis by an acoustical engineer (Appendix D). This analysis concluded that noise generated by the mine will meet the State of Washington's daytime and nighttime noise limits for the closest potential residential receptors in the site vicinity. The distance from the site operations to the residential receptors as well as the undisturbed buffers surrounding the project are sufficient without requiring additional mitigation measures. Project-related traffic noise is not anticipated to exceed Federal Highway Administration abatement criteria for roadway traffic noise. The full report and associated discussion are provided in Appendix D.

- 3. Not cause the pedestrian and vehicular traffic associated with the use to conflict with existing and anticipated traffic in the neighborhood to an extent greater than that associated with other permitted uses in the applicable zoning district;***

McCloskey Creek Road, Mabee Mines Road, and Salmon Falls Road are already used for timber hauling, which can result in hundreds of truck trips per day during harvest. Depending on market conditions, we anticipate up to 250 daily round trips could be generated by the proposed project during peak season and peak economic conditions, with heaviest volumes occurring mid-morning and later-afternoon. To assess and model the effect of mining operations on local transportation systems, the applicant commissioned a Transportation Impact Study by a traffic engineer (Appendix C). This study concludes that impacts to the Level of Service (LOS) for affected roads and intersections are within operating standards for rural areas as defined by the Washington State Department of Transportation (WSDOT). No impacts or increases to pedestrian traffic are anticipated for the local area.

- 4. Be supported by adequate service facilities and would not adversely affect public services to the surrounding area;***

The principal impact to public services in the area is increased traffic along local roadways due to

commercial hauling associated with the mine. The Transportation Impact Study commissioned for the site concludes that impacts to the LOS for affected roads and intersections are within operating standards for rural areas as defined by WSDOT.

No additional burden to local utility services, emergency services, or other public services are anticipated. The quarry will likely be staffed by 5 to 10 people depending on site operations and seasonal variances in activity. Bottled water and portable toilets will be provided for employees.

- 5. *Not hinder or discourage the development of permitted uses on neighboring properties in the applicable zoning district as a result of the location, size or height of the buildings, structures, walls, or required fences or screening vegetation to a greater extent than other permitted uses in the applicable zoning district;***

No permanent structures are planned as part of mining operations on site. A small office, scale house and scales will be temporarily present on-site during mining operations. These will be dismantled and hauled away during the reclamation phase of the project. Vegetated setbacks adjacent to the proposed mine area will be composed of topsoil berms and existing vegetation, will be a minimum of 50 feet wide, and will not be disturbed as part of mining operations.

- 6. *Not be in conflict with the goals and policies expressed in the current version of the County's comprehensive plan.***

The site is located within the area of the West End Community Comprehensive Subarea Plan ("West End Comp Plan", adopted by Skamania County in 2007). Under Commercial Resource Land 40 (CRL40), p. 27, the West End Comp Plan designates the same uses for this area as described under SCC Section 21.67.100, as follows:

"The designation of commercial resource lands is designed to meet the minimum requirements of the Washington State Growth Management Act (Chapter 36.07A RCW) that mandates the designation and protection of forest, agricultural, and mineral resource lands of long-term commercial significance."

Thus, the development of a commercial aggregate quarry is compatible with the West End Comp Plan designation of the site as Commercial Resource Lands with a minimum lot size of 40 acres. The proposed project will develop mineral resources within a 273.6-acre permit boundary, providing over 20 million cubic yards of aggregate resource to the local economy for both public and private improvement projects. In accordance with the Growth Management Act, the parcels that enclose the site were designated as resource lands, have mineral resources of long-term significance, and should be developed for their intended use.

With regard to perceived conflicts that may be of concern to the local community, including several residences located southwest of the site along the proposed access through the BPA alignment, the West End Comp Plan also addresses potentially conflicting uses on p. 27:

"...regulations shall assure that the use of lands adjacent to agricultural, forest, or mineral resource lands shall not interfere with continued use, in the accustomed manner and in

accordance with best management practices, of these designated lands for the production of food, agricultural products, or timber, or for the extraction of minerals.”

Mining and its associated activities are not without effect on the local community. A Traffic Impact Study and Sound Analysis were completed to evaluate potential impacts on surrounding residential receptors and local roadways. Based on the findings of those analyses, the proposed project will not have impacts that would exceed state or federal standards.

Through this CUP application and its associated documents and studies, we have demonstrated that potential impacts on the environment, community, and overall character of the area fall into two categories: Impacts that will be noticeable but are within parameters judged to be acceptable by applicable standards, and impacts that can be mitigated by adherence to policies and BMPs outlined by the DNR and DOE. The latter two agencies will require permits to be approved to their standards before any mining can be conducted on the property, and ongoing compliance with those permits will be required and inspected by staff from both agencies.

In the long term, the proposed mine is temporary, and the affected areas will be reclaimed back to commercial forest lands at the end of the mine’s life cycle.

Attachments

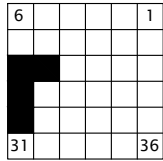
One copy submitted (via email only)

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FIGURES

T 2 N



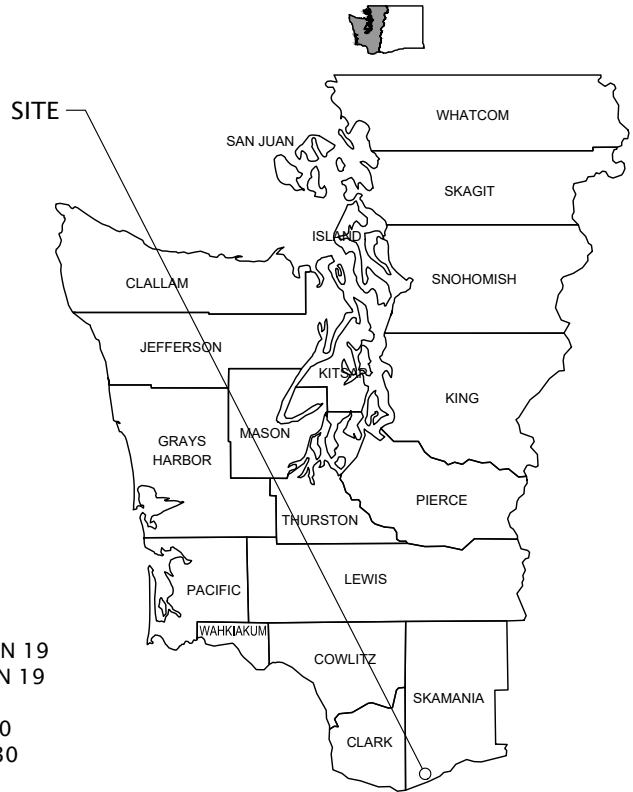
R 6 E

SITE COORDINATES:

LATITUDE: 45° 38' 24" N

LONGITUDE: 122° 6' 43" W

WESTERN WASHINGTON



DIRECTIONS TO SITE

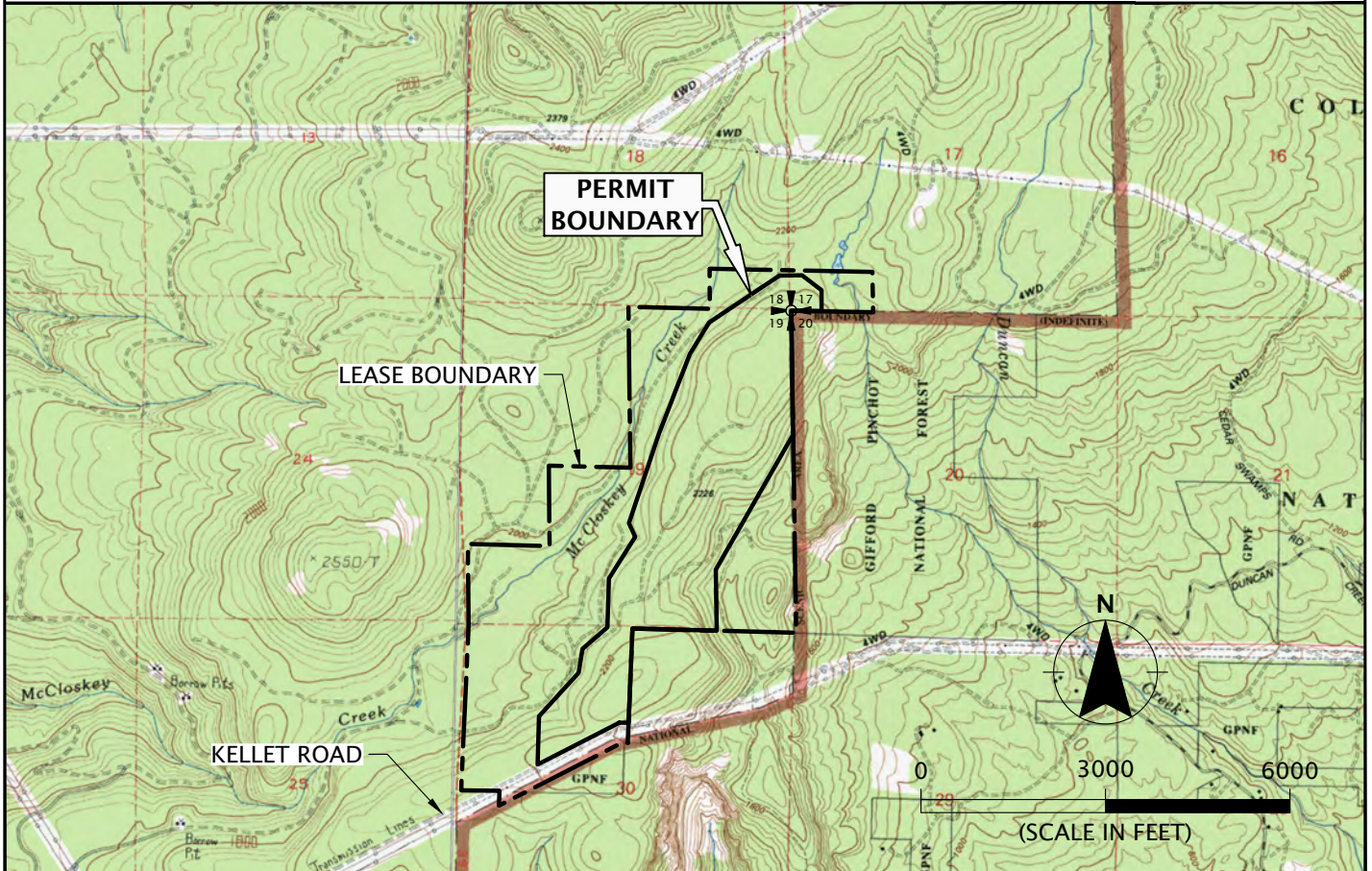
SKAMANIA QUARRY IS LOCATED NORTHEAST OF WASHOUGAL, WA. FROM WASHOUGAL, DRIVE EASTBOUND ON HIGHWAY 14 FOR APPROXIMATELY 8 MILES. TURN LEFT (NORTH) ONTO SALMON FALLS ROAD. DRIVE NORTHBOUND FOR ROUGHLY 1 MILE, THEN TURN RIGHT (EAST) ONTO MABEE MINES ROAD. FOLLOW MABEE MINES ROAD FOR APPROXIMATELY 2 MILES, THEN TURN RIGHT ONTO KELLET ROAD. FOLLOW KELLET ROAD FOR APPROXIMATELY 1.75 MILES. SKAMANIA QUARRY IS LOCATED ON THE LEFT (NORTH) SIDE OF KELLET ROAD.

LEGAL DESCRIPTION

THE PERMIT BOUNDARY IS LOCATED IN PORTIONS OF THE FOLLOWING QUARTER-QUARTER SECTIONS:

- SW QUARTER OF THE SW QUARTER OF SECTION 17
- SE QUARTER OF THE SE QUARTER OF SECTION 18
- NW, NE, SE, SW QUARTERS OF THE NE QUARTER OF SECTION 19
- NW, NE, SE, SW QUARTERS OF THE SE QUARTER OF SECTION 19
- SE QUARTER OF THE SW QUARTER OF SECTION 19
- NE AND SE QUARTERS OF THE NW QUARTER OF SECTION 30
- NW AND SW QUARTERS OF THE NE QUARTER OF SECTION 30

NOTE: USGS TOPOGRAPHIC QUADRANGLE MAP REPRODUCED USING MAPTECH TERRAIN NAVIGATOR PRO®.



STOREDAHL & SONS, INC.

VICINITY MAP
SKAMANIA QUARRY

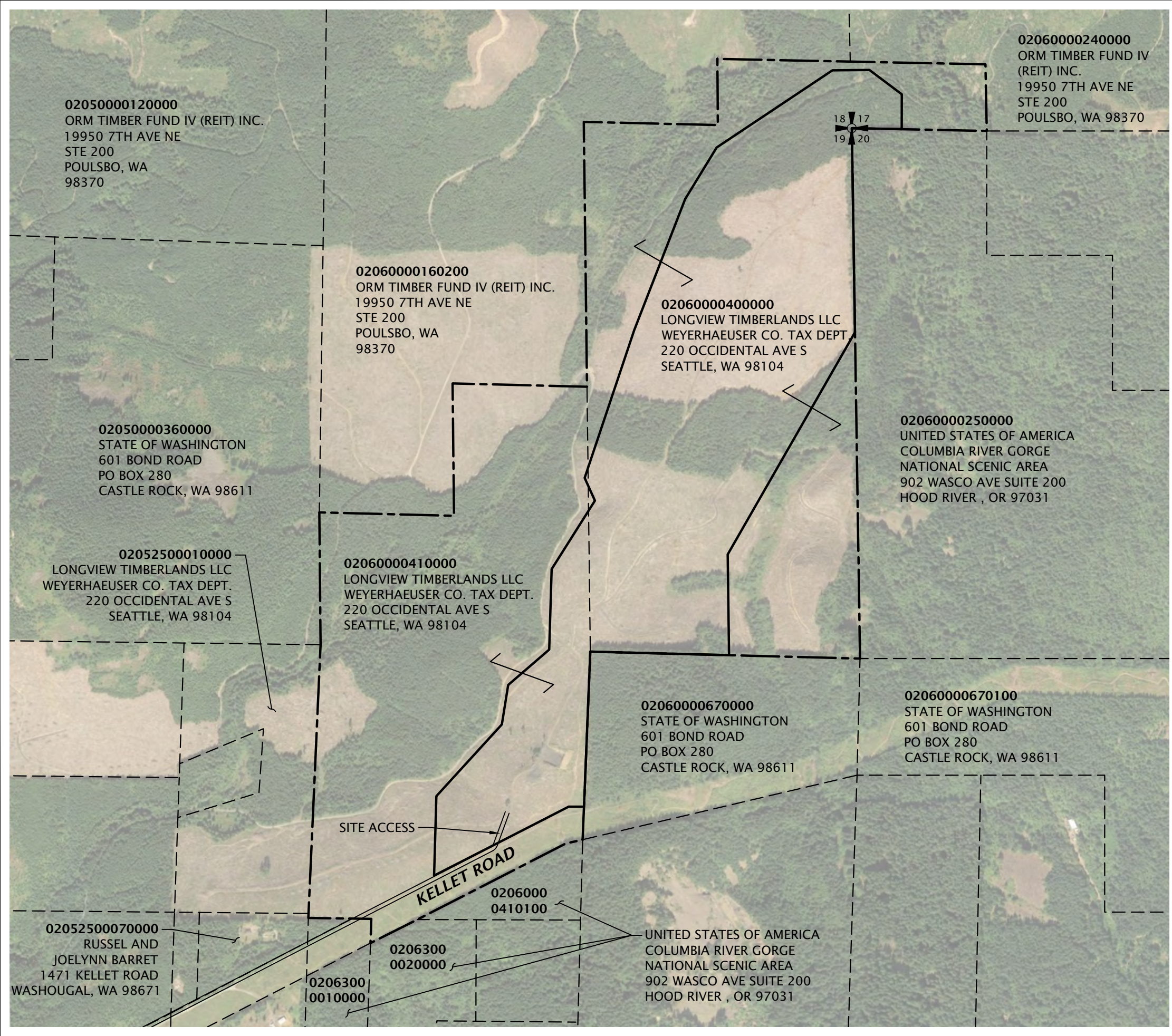
STOREDAHL-12-01
AUGUST 2021

SKAMANIA COUNTY, WA
SECS. 17, 18, 19 & 30, TOWNSHIP 2N, RANGE 6E, W.M.

FIGURE 1

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 File Name: J:\S-Z\Storedah1-12\Storedah1-12-01\Figures\CAD\Storedah1-12-01-VM-AP03.dwg | Layout: FIGURE 2



02050000120000
 ORM TIMBER FUND IV (REIT) INC.
 19950 7TH AVE NE
 STE 200
 POULSBO, WA
 98370

02060000160200
 ORM TIMBER FUND IV (REIT) INC.
 19950 7TH AVE NE
 STE 200
 POULSBO, WA
 98370

02060000240000
 ORM TIMBER FUND IV (REIT) INC.
 19950 7TH AVE NE
 STE 200
 POULSBO, WA 98370

02060000400000
 LONGVIEW TIMBERLANDS LLC
 WEYERHAEUSER CO. TAX DEPT
 220 OCCIDENTAL AVE S
 SEATTLE, WA 98104

02060000250000
 UNITED STATES OF AMERICA
 COLUMBIA RIVER GORGE
 NATIONAL SCENIC AREA
 902 WASCO AVE SUITE 200
 HOOD RIVER , OR 97031

02050000360000
 STATE OF WASHINGTON
 601 BOND ROAD
 PO BOX 280
 CASTLE ROCK, WA 98611

02052500010000
 LONGVIEW TIMBERLANDS LLC
 WEYERHAEUSER CO. TAX DEPT.
 220 OCCIDENTAL AVE S
 SEATTLE, WA 98104

02060000410000
 LONGVIEW TIMBERLANDS LLC
 WEYERHAEUSER CO. TAX DEPT.
 220 OCCIDENTAL AVE S
 SEATTLE, WA 98104

02060000670000
 STATE OF WASHINGTON
 601 BOND ROAD
 PO BOX 280
 CASTLE ROCK, WA 98611

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 STATE OF WASHINGTON
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 CASTLE ROCK, WA 98611



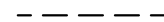

02052500070000
 RUSSEL AND
 JOELLYN BARRET
 1471 KELLET ROAD
 WASHOUGAL, WA 98671

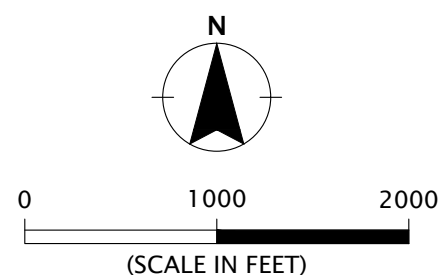
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02063000020000
020630000410100

UNITED STATES OF AMERICA
 COLUMBIA RIVER GORGE
 NATIONAL SCENIC AREA
 902 WASCO AVE SUITE 200
 HOOD RIVER , OR 97031

SITE ACCESS
 KELLET ROAD

LEGEND:

-  PERMIT BOUNDARY (273.6 ACRES)
-  LEASE BOUNDARY
-  PARCEL LINES
- 020600004000000** PARCEL NUMBER
-  SECTION CORNER
 - 45° 39' 00"N
 - 122° 06' 20"W



NOTES:

1. AERIAL PHOTOGRAPH (SEPTEMBER 3, 2018) OBTAINED FROM GOOGLE EARTH PRO.
2. PROPERTY PARCEL BOUNDARIES AND INFORMATION OBTAINED FROM SKAMANIA COUNTY ASSESSOR AND WEYERHAEUSER.

PROPERTY OWNERSHIP MAP
 SKAMANIA QUARRY

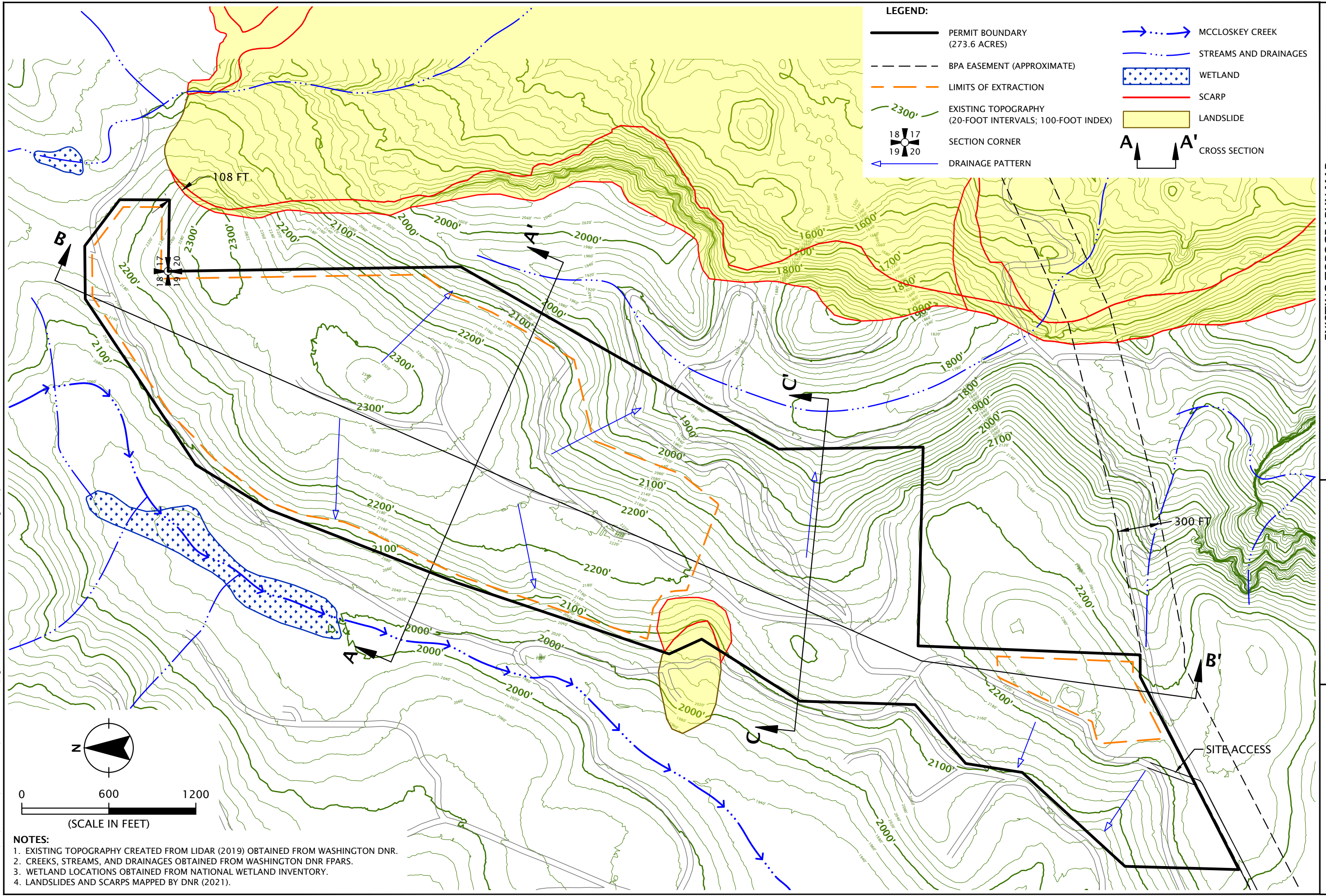
SKAMANIA COUNTY, WA
 SECS. 17, 18, 19 & 30, TOWNSHIP 2N, RANGE 6E, W.M.

STOREDAHL & SONS, INC.

STOREDAHL-12-01
 AUGUST 2021



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 File Name: J:\S-Z\Storeahl\Storeahl-12\Storeahl-12-01\Figures\CAD\Storeahl-12-01-EG-RS-FLO6.dwg | Layout: FIGURE 3

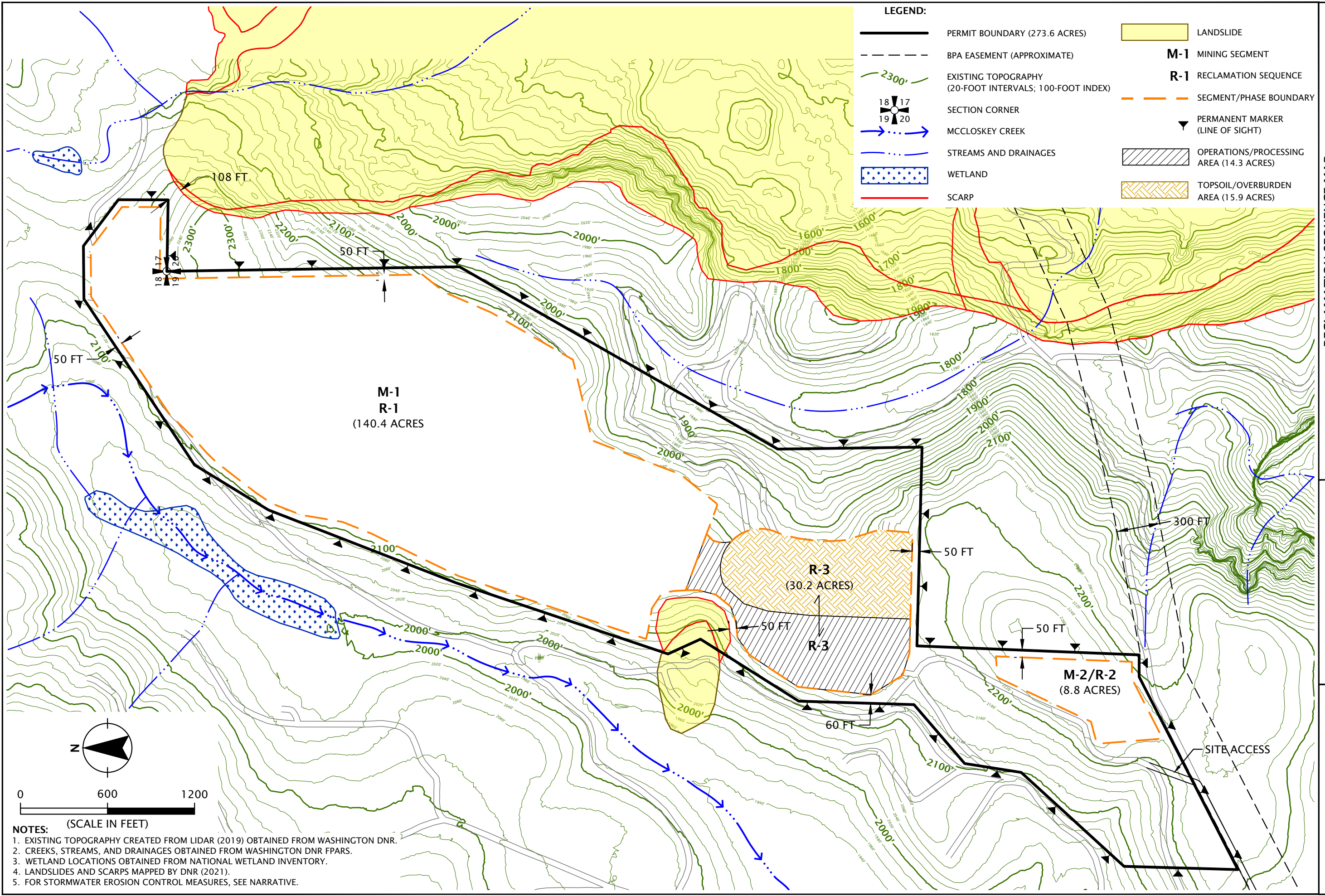


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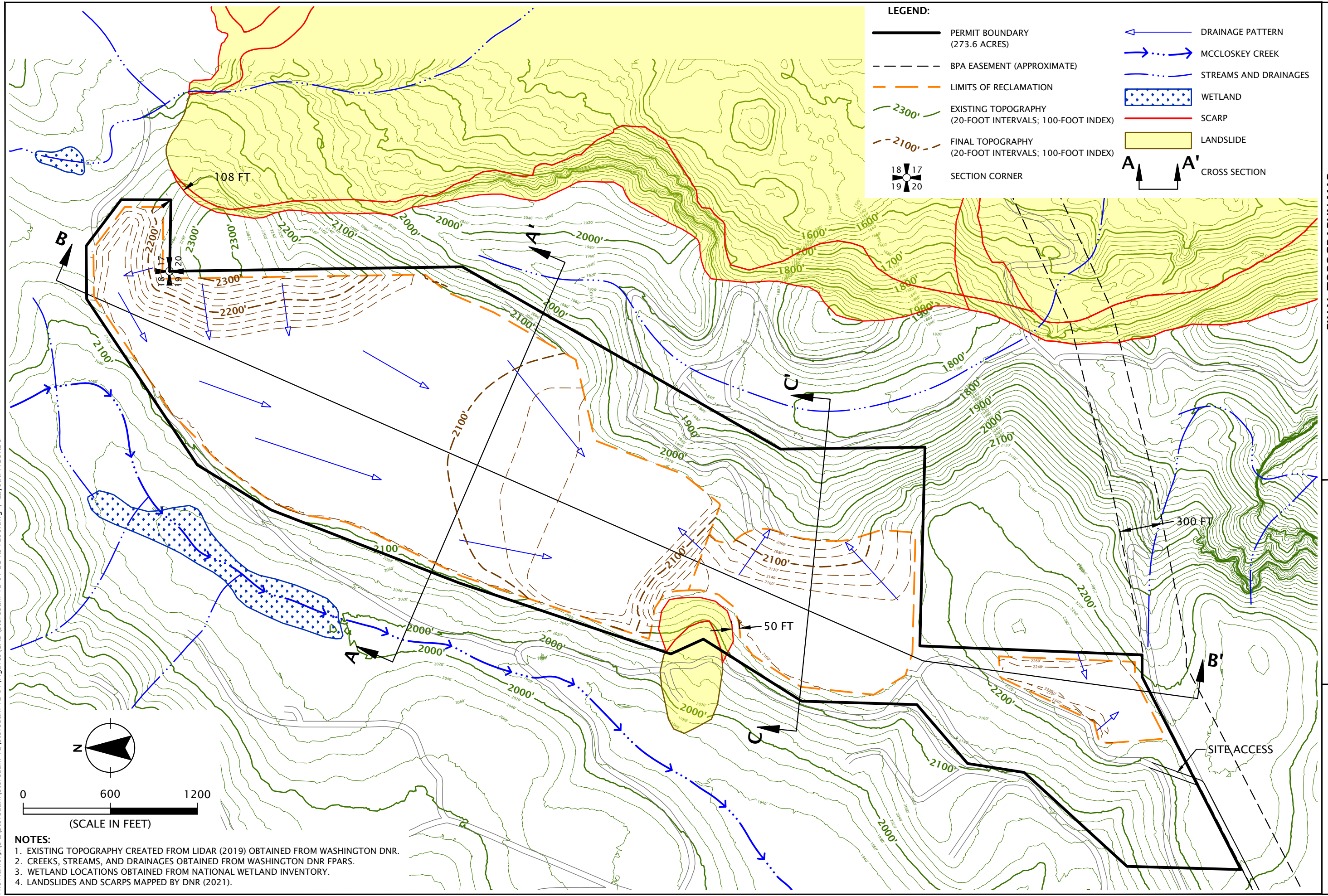
	PERMIT BOUNDARY (273.6 ACRES)		MCCLOSKEY CREEK
	BPA EASEMENT (APPROXIMATE)		STREAMS AND DRAINAGES
	LIMITS OF EXTRACTION		WETLAND
	EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX)		SCARP
	SECTION CORNER		LANDSLIDE
	DRAINAGE PATTERN		CROSS SECTION

- NOTES:**
1. EXISTING TOPOGRAPHY CREATED FROM LIDAR (2019) OBTAINED FROM WASHINGTON DNR.
 2. CREEKS, STREAMS, AND DRAINAGES OBTAINED FROM WASHINGTON DNR FPARS.
 3. WETLAND LOCATIONS OBTAINED FROM NATIONAL WETLAND INVENTORY.
 4. LANDSLIDES AND SCARPS MAPPED BY DNR (2021).

	STOREDAHL & SONS, INC. STOREDAHL-12-01 AUGUST 2021	EXISTING TOPOGRAPHY MAP SKAMANIA QUARRY	FIGURE 3
	SKAMANIA COUNTY, WA SECS. 17, 18, 19 & 30, TOWNSHIP 2N, RANGE 6E, W.M.		



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 File Name: J:\S-Z\Storeahl\Storeahl-12\Storeahl-12-01\Figures\CAD\Storeahl-12-01-EG-RS-FLO6.dwg | Layout: FIGURE 5

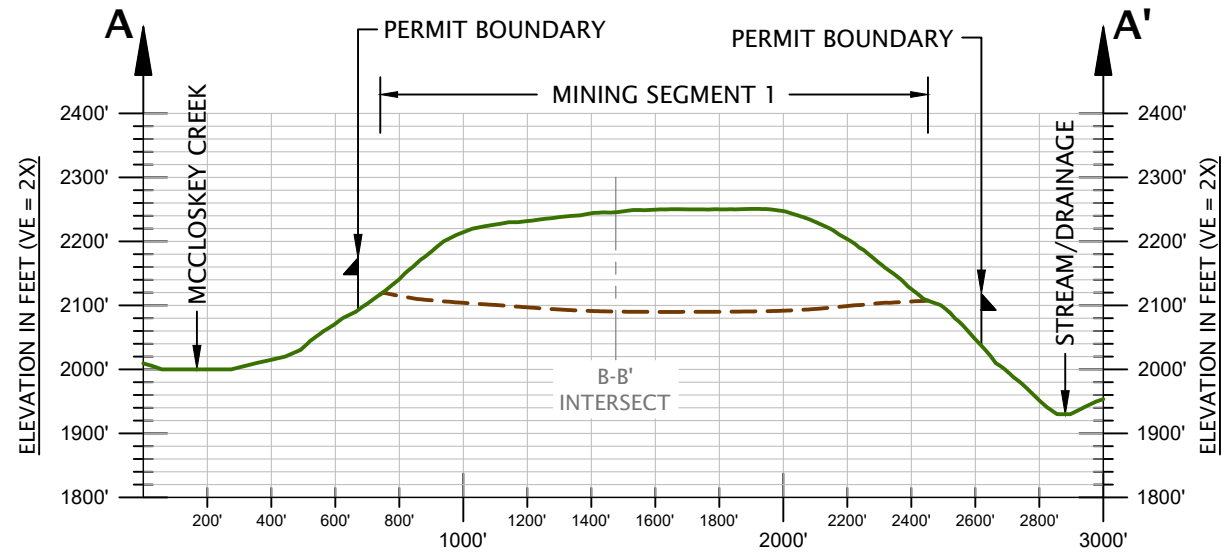


LEGEND:

- PERMIT BOUNDARY (273.6 ACRES)
- BPA EASEMENT (APPROXIMATE)
- LIMITS OF RECLAMATION
- EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX)
- FINAL TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX)
- SECTION CORNER
- DRAINAGE PATTERN
- MCCLOSKEY CREEK
- STREAMS AND DRAINAGES
- WETLAND
- SCARP
- LANDSLIDE
- CROSS SECTION

- NOTES:**
1. EXISTING TOPOGRAPHY CREATED FROM LIDAR (2019) OBTAINED FROM WASHINGTON DNR.
 2. CREEKS, STREAMS, AND DRAINAGES OBTAINED FROM WASHINGTON DNR FPARS.
 3. WETLAND LOCATIONS OBTAINED FROM NATIONAL WETLAND INVENTORY.
 4. LANDSLIDES AND SCARPS MAPPED BY DNR (2021).

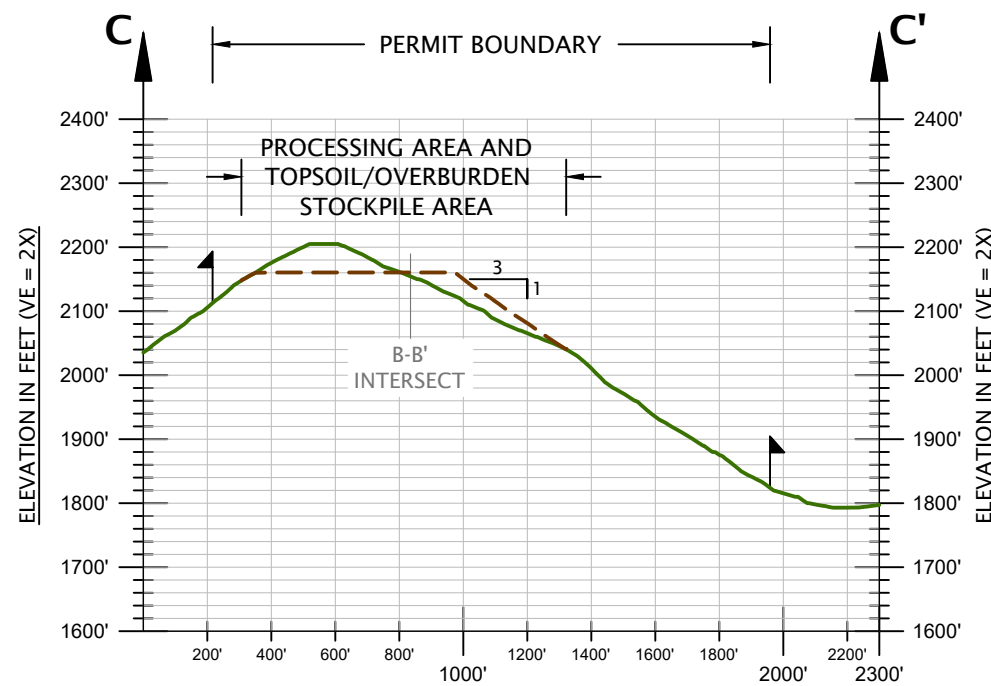
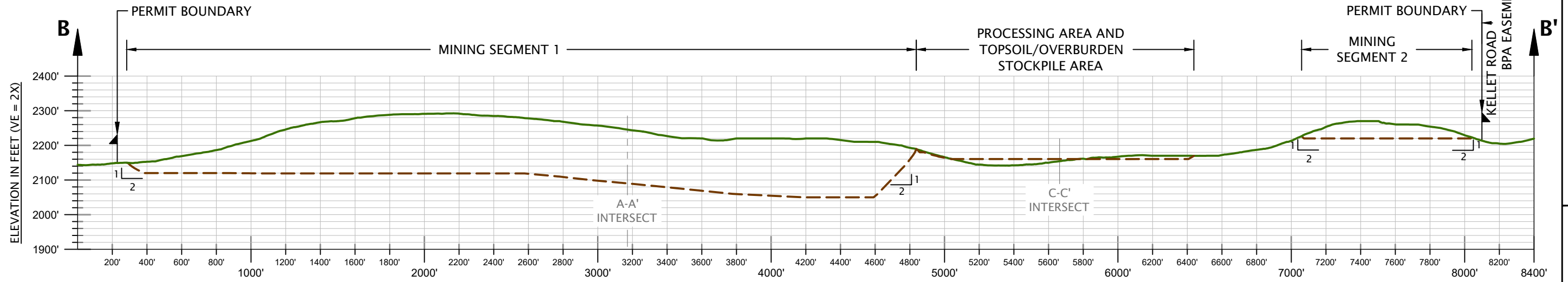
	STOREDAHL & SONS, INC. STOREDAHL-12-01 AUGUST 2021	FINAL TOPOGRAPHY MAP SKAMANIA QUARRY SKAMANIA COUNTY, WA SECS. 17, 18, 19 & 30, TOWNSHIP 2N, RANGE 6E, W.M.	FIGURE 5
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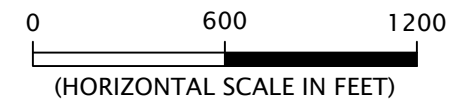
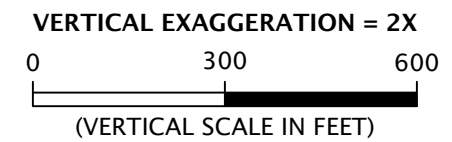
LEGEND:
 ——— EXISTING TOPOGRAPHY
 - - - FINAL TOPOGRAPHY
 ↑ PERMANENT MARKER

VOLUMES - LIMITS OF EXCAVATION	
EXCAVATION VOLUME	24,017,872 CUBIC YARDS
OVERBURDEN *	2,889,998 CUBIC YARDS
NET RESOURCE VOLUME	21,127,874 CUBIC YARDS

* OVERBURDEN VOLUME BASED ON AVERAGE OVERBURDEN THICKNESS OF 12 FEET



VOLUMES - PROCESSING AND TOPSOIL/OVERBURDEN STOCKPILE AREA	
CUT VOLUME	284,651 CUBIC YARDS
FILL VOLUME	320,598 CUBIC YARDS
NET VOLUME (FILL)	35,947 CUBIC YARDS



APPENDIX A

SEPA ENVIRONMENTAL CHECKLIST

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the [SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS \(part D\)](#). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [\[HELP\]](#)

1. Name of proposed project, if applicable:

Skamania Quarry

2. Name of applicant:

J.L. Storedahl and Sons, Inc.

3. Address and phone number of applicant and contact person:

**Contact: Bo Storedahl
2233 Talley Way, Kelso, WA 98626
(360) 636-2420**

4. Date checklist prepared:

August 13, 2021

5. Agency requesting checklist:

Skamania County Community Development Office

6. Proposed timing or schedule (including phasing, if applicable):

Start 2021, pending approvals. Anticipated life of project approximately 30 to 40 years depending on market demand.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

**DKS, Transportation Impact Study, dated February 19, 2020
BRC Acoustics, Sound Analysis, dated September 9, 2020
NV5, Geotechnical Assessment, 2021**

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No

10. List any government approvals or permits that will be needed for your proposal, if known.

**Conditional Use Permit – Skamania County
Surface Mine Reclamation Permit – Washington Department of Natural Resources (DNR)
Sand and Gravel General Permit – Washington Department of Ecology (DOE)
Air Discharge Permit for Rock Crusher – Southwest Clean Air Agency (SWCAA)**

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Establishing a surface mining operation for the production and processing of aggregate resources (see Figure 5) including drilling, blasting, loading, hauling, crushing, screening, stockpiling, and commercial sales of crushed aggregate. The project will include a small operations and storage area, as well as the improvement and maintenance of an access road along the BPA corridor to the southwest (see Figure 2). The total permit area will be 273.6 acres. Surface mining will be divided into two segments: mine segment 1, at the north end of the site, with an approximate area of 140.4 acres, and mine segment 2, with an approximate area of 8.8 acres. Per guidelines established by the DNR, the mine segments will be mined in sequence - with reclamation, replacement of topsoil, and re-vegetation occurring as mining is completed in each segment. Topsoil from both areas will be stored in perimeter berms. Overburden and additional topsoil will be stockpiled in a graded area at the center of the site, the construction of which will involve cut and fill methods to achieve a level area. All mining disturbance will be reclaimed back to commercial forestry upon the completion of mining activities.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Proposed permit boundary is located in the SW quarter of the SW quarter of Section 17; the SE quarter of the SE quarter of Section 18; NW, NE, SE, and SW quarters of the NE quarter of Section 19; the NW, NE, SE and SW quarters of the SE quarter of section 19; the SE quarter of the SW quarter of Section 19; the NE and SE quarters of the NW quarter of Section 30; and the NW and SW quarters of the NE quarter of Section 30; all located within Township 2 North and Range 6 East of the Willamette Meridian. See attached Figure 1.

B. Environmental Elements [\[HELP\]](#)

1. **Earth** [\[help\]](#)

a. General description of the site:

(circle one): Flat, rolling hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

Near vertical on natural bedrock exposures.

- c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The USDA Natural Resource Conservation Service (NRCS) has mapped soils within the permit area as composed of the Skoly Stony Loam , 2 to 15 percent slopes and Skoly Stony Loam, 30 to 65 percent slopes. A small area of Mountzion Clay Loam, 2 to 15 percent slopes is present at the southwest edge of the site. The current land use for the area is forestry, and these soil types are most suitable for that use. Mining on the site will require the removal of topsoil during operations, but topsoil will be stockpiled and returned to reclaimed areas after mining is complete.

- d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

An ancient, large, deep-seated landslide is mapped approximately 100 to 800 feet east of the proposed mine site associated with erosion along the Columbia River. The mechanism and bedrock conditions responsible for this massive landslide will not be altered or influenced by the proposed mining activity. A small, shallow failure is inferred with moderate confidence by the DNR on the western flank of proposed mine permit boundary (see Figures 3 through 5). A Geotechnical Assessment has been provided evaluating the landslide hazards mapped at the site. Based on the findings in the Assessment, the proposed project will not have an adverse impact to the geologically hazardous areas identified at the site.

- e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Three areas are proposed for segmented mining, operations and storage. The total area to be disturbed by mining operations is approximately 180 acres. The graded area comprising the stockpile and operations areas in the center of the site will include approximately 321,000 cubic yards of fill, and an approximate cut volume of 285,000 cubic yards. The balance of fill will come from overburden within the mining areas to expose resource materials for mining. Overall, approximately 24 million cubic yards of material will be excavated from the mining areas. Overburden and non-resource rock materials will be placed in depleted portions of the mine excavations as mining progresses. Once mining operations are completed for a segment, overburden and topsoil will be re-distributed over the reclaimed area. Further details of cut and fill operations are provided in the attached Figures 5 and 6.

- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Yes, there is potential for erosion of soils to occur through removal of topsoil and placement of fill in the mine disturbance areas.

- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

None – the site will be reclaimed to commercial forest at the completion of mining.

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The mine segments will be excavated downward into the bedrock ridge and sloped inward, preventing stormwater runoff from leaving the mined excavations. The interpreted shallow landslide on the western edge of the permit area will be avoided, and the closest earthwork activity to this feature will consist of cutting material away for the storage area, so no surcharge loads will be placed that may affect stability. Stormwater control will prevent runoff from leaving the disturbance area. Long-term stockpiles of overburden, topsoil, and perimeter berms will be vegetated for erosion control.

Stormwater control measures and Best Management Practices (BMPs) to prevent potential erosion of soils will be included in the required DNR Reclamation Permit and DOE Sand and Gravel General Permit for the site.

2. Air [\[help\]](#)

- a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Emissions from equipment operating on site (i.e. dozers, loaders, haul trucks) will occur during operating hours; no emissions will occur at the completion of the project. Dust could potentially be released as part of mining operations and transport of materials out of the mine site.

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No

- c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Operating equipment will be equipped with requisite mufflers and emission control exhaust systems to meet existing state and federal regulatory standards. Protocols for dust control, including use of a water truck to wet work surfaces and haul roads and use of fog nozzles on the crushing equipment, will be established for the site as part of the DOE Sand and Gravel General Permit and SWCAA air permit.

3. Water [\[help\]](#)

- a. Surface Water: [\[help\]](#)

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

McCloskey Creek, a perennial stream, runs at the base of the slope west of the proposed permit area. According to the National Wetland Inventory, a freshwater-forested shrub wetland occupies a portion of the valley containing McCloskey Creek west of the proposed permit area. Hamilton Creek, a perennial stream, and a small marsh along its channel are located northeast of the proposed permit boundary. A seasonal stream, Indian Mary Creek, runs east of the proposed permitted area. An unnamed seasonal stream's headwaters are mapped south of the proposed permit area. All mapped streams are more than 100 feet, and wetlands are more than 300 feet, from the proposed

limits of excavation for the project. McCloskey Creek is a tributary of the Washougal River, and the other streams are tributaries of the Columbia River.

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Not applicable

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No

b. Ground Water: [\[help\]](#)

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No groundwater will be withdrawn. Stormwater infiltration facilities will be designed to manage a 24-hour, 25-year storm event to infiltrate to groundwater.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No septic system is planned.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Stormwater from areas disturbed by mining activities will be directed to infiltration basins within the mine excavation perimeter and designed for a 24hr. – 25yr. storm event. Prior to disturbance of the site a detailed description of stormwater control measures

and BMPs to prevent potential erosion of soils from leaving the site will be included in the DNR Reclamation Permit and DOE Sand and Gravel General Permit.

2) Could waste materials enter ground or surface waters? If so, generally describe.

There will be no waste materials on site. Any potential sediment from runoff will be contained and/or prevented from leaving the disturbed areas of the site.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

The only source of runoff on site will be stormwater. Stormwater will be collected in infiltration basins on site designed for a 24hr. – 25yr. storm event. Prior to disturbance of the site a detailed description of stormwater control measures and best management practices (BMP's) to prevent potential erosion of soils from leaving the site will be included in the DNR Reclamation Permit and DOE Sand and Gravel General Permit.

4. **Plants** [\[help\]](#)

a. Check the types of vegetation found on the site:

- deciduous tree: alder, maple, aspen, other
- evergreen tree: fir, cedar, pine, other
- shrubs
- grass
- pasture
- crop or grain
- Orchards, vineyards or other permanent crops.
- wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- water plants: water lily, eelgrass, milfoil, other
- other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

The site was recently logged in accordance with approved forest practices. Remaining surface vegetation will be cleared in areas to be mined. The majority of surface vegetation consists of immature and recently replanted evergreen trees, underbrush and slash associated with recently logged areas, and lesser isolated stands of more mature timber.

c. List threatened and endangered species known to be on or near the site.

None are known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Reclaimed mining areas will be revegetated according to DNR reclamation standards and requirements for the prescribed subsequent use (commercial forestry).

e. List all noxious weeds and invasive species known to be on or near the site.

None are known.

5. Animals [\[help\]](#)

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: **hawk, heron, eagle, songbirds**, other:

mammals: **deer, bear, elk**, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site.

Currently, the Washington Department of Fish and Wildlife lists the site as a buffer zone for spotted owl habitat. The majority of the proposed mine site was recently logged, and remaining trees are relatively young and would not likely provide habitat for spotted owls. As such, few (if any) areas within the site constitute prime habitat for the spotted owl.

c. Is the site part of a migration route? If so, explain.

Pacific flyway (including all of Washington State)

d. Proposed measures to preserve or enhance wildlife, if any:

The site was recently logged in accordance with approved forest practices. Where practical, stands of relatively mature timber will be left undisturbed. Upon completion of mine segments, the area will be reclaimed in accordance with the reclamation plan (overseen by the DNR), topsoil re-distributed, and native species replanted in reclaimed areas. This will preserve and enhance wildlife by providing varied age classes of timber and edge effect for forage.

e. List any invasive animal species known to be on or near the site.

None are known.

6. Energy and Natural Resources [\[help\]](#)

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Petroleum products (diesel, gasoline) will power processing, excavation, and hauling equipment.

- b. Would your project affect the potential use of solar energy by adjacent properties?
If so, generally describe.

No

- c. What kinds of energy conservation features are included in the plans of this proposal?
List other proposed measures to reduce or control energy impacts, if any:

Not applicable

7. Environmental Health [\[help\]](#)

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal?
If so, describe.

Accidental fuel or oil spills are possible from mine operations, but a DOE-approved Pollution Prevention and Spill Control Plan (SCP) will be followed and revised as necessary throughout the life of the project according to the site's Sand and Gravel General Permit requirements. Explosives are utilized to fracture the in-situ stone by licensed blasting subcontractors. Strict regulations and protocols are followed during these controlled blasts.

- 1) Describe any known or possible contamination at the site from present or past uses.

None known.

- 2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None known.

- 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Fuel and lubricants will be used by mining equipment but will not be stored onsite. A mobile service truck will be used to service and fuel equipment. A detailed spill response plan will be integrated into the BMPs for the site in accordance with the DOE Sand and Gravel General Permit.

- 4) Describe special emergency services that might be required.

None are known

- 5) Proposed measures to reduce or control environmental health hazards, if any:

The SCP will remain in effect through project duration. BMPs will be employed on site to reduce the potential for accidental fuel or oil spills from occurring during equipment refueling. BMPs will also be used to quickly and completely clean up any spills consistent with the SCP and to remove any spill-contaminated materials to an approved disposal site.

b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None

- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Proposed hours of operation are 7:00 am to 4:30 pm. Noise will be generated by mine activities during operating hours, including material extraction, on site transportation by truck and conveyor, crushing, screening, and the loading out of trucks. Traffic noise from trucks entering and exiting the site will also contribute to project noise. Drilling and blasting of bedrock will generate noise on an infrequent basis on site. Employees may arrive approximately a half-hour before and stay for up to an hour after normal business hours to prepare for business and conduct closure and maintenance activities.

As part of permitting efforts for the site, a sound analysis was completed by BRC Acoustics. The study concluded that “sound levels...[will] meet State of Washington daytime and nighttime noise limits at all sound analysis locations.” Specific to traffic noise, the study found that “the calculated sound levels do not approach or exceed the Federal Highway Administration (FHWA) Abatement Criterion of 67 dBA at the sound analysis locations.” Further details are provided in the report, which is included as part of the larger submittal package for a Conditional Use Permit from Skamania County.

- 2) Proposed measures to reduce or control noise impacts, if any:

Requisite muffling devices will be maintained on all trucks and excavating equipment servicing the site. Blasting will be performed in accordance with state and federal regulations, which provide significant guidance for reducing and/or eliminating noise to nearby receptors. A minimum 50-foot vegetated buffer will be maintained along the entire perimeter of the project site.

8. Land and Shoreline Use [\[help\]](#)

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Current land use on the site is forestry. Areas adjacent to the site in nearly all directions are used for commercial forestry. An easement for BPA transmission lines and towers is located long a portion of the southern boundary. A few rural residences are located further southwest of the project area along Kellet Road. The Columbia River Gorge National Scenic Area is located south and east of the site.

Noise from the mine site and haul traffic to and from the site could affect the land use of adjacent properties. As part of this application, a Sound Analysis and Transportation Impact Study have been completed to quantify these impacts and evaluate if the projected impacts would be compliant with established standards. Both studies are presented as part of this application package. Based on the findings of those analyses, the proposed project will not have impacts that would exceed state or federal standards.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The site has been utilized as working forest land, where multiple rotations of commercial timber have been harvested. Mining is a permitted use with a County CUP. The site will be reclaimed and returned to commercial forest lands at the completion of mining, in accordance with the DNR reclamation plan for the site.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No

b. Describe any structures on the site.

None

d. Will any structures be demolished? If so, what?

No

e. What is the current zoning classification of the site?

West End Commercial Resource Lands 40 (WE-CRL40)

f. What is the current comprehensive plan designation of the site?

West End Subarea – Commercial Resource Lands

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Yes – per Skamania County Code (SCC) Section 19.07.010, DNR has mapped a small landslide in the west-central portion of the site, as well as the site being west of a large, deep seated landslide dating from pre-historic times. A Geotechnical Assessment has been provided evaluating the landslide hazards mapped at the site. Based on the findings in the Assessment, the proposed project will not have an adverse impact to the geologically hazardous areas identified at the site.

i. Approximately how many people would reside or work in the completed project?

No residents, potentially 5 to 10 workers

j. Approximately how many people would the completed project displace?

None

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not Applicable

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

At the completion of reclamation, the subsequent use will be re-established to commercial forestry.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Not Applicable.

9. Housing [\[help\]](#)

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Not Applicable

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Not Applicable

c. Proposed measures to reduce or control housing impacts, if any:

Not Applicable

10. Aesthetics [\[help\]](#)

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

A temporary scalehouse, office and scales will be placed onsite. These structures will generally not exceed 14 feet in height. Neutral color composite siding is the anticipated exterior of these temporary structures.

b. What views in the immediate vicinity would be altered or obstructed?

None. The current operations area is planned in a relative topographic low and will be visible only from the opposite side of the valley to the west, which is currently uninhabited and occupied by timberlands.

d. Proposed measures to reduce or control aesthetic impacts, if any:

None.

11. *Light and Glare* [\[help\]](#)

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Excavation and hauling will take place during daylight hours therefore lighting will not normally be required. During times of particularly high demand or for response to emergencies, lighting may be required for the operations area during night-time hours. These sources will be limited to machinery and the immediate surrounds of the scalehouse and shop. These light sources will be downward shielded to avoid glare and offsite light pollution.

- b. Could light or glare from the finished project be a safety hazard or interfere with views?

Daylight operations would preclude significant light pollution from the site. During infrequent nighttime activity in the operations area, light sources will be well shielded to avoid glare and light pollution.

- c. What existing off-site sources of light or glare may affect your proposal?

None

- d. Proposed measures to reduce or control light and glare impacts, if any:

Work hours will limit the need for lighting. When necessary, lighting will be directed at the work areas and shielded to avoid impacting areas outside the mine.

12. *Recreation* [\[help\]](#)

- a. What designated and informal recreational opportunities are in the immediate vicinity?

Hunting and fishing are likely available within a half-mile of the site.

- b. Would the proposed project displace any existing recreational uses? If so, describe.

No

- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

On-site activities will not affect existing recreational opportunities.

13. *Historic and cultural preservation* [\[help\]](#)

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

None are known.

- b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts,

or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

None are known. The site has experienced several rotations of commercial timber harvest.

- c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Visual observations of the recently logged ground surface and small timber pit currently located on the site were completed. No cultural resources were observed.

- d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

If during excavation or development of the site an area of potential archaeological significance is uncovered, all activity in the immediate area shall be halted. Skamania County and the Washington Department of Archaeology and Historic Preservation (DAHP) shall be notified of the finding.

14. Transportation [\[help\]](#)

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The attached traffic study reviewed primary site accesses via McCloskey Creek Road to Mabee Mines Road, which utilizes Salmon Falls Road to connect to State Highway 14. As part of the attached traffic study, the intersection of Mabee Mines Road and Salmon Falls Road, the intersection of Canyon Creek Road and Salmon Falls Road, and the Intersection of Salmon Falls Road and State Highway 14 were studied. Detailed traffic analysis on nearby roads and streets is provided in the attached Transportation Impact Study.

Traffic access from the site to the public street system has been coordinated with the Bonneville Power Authority (BPA) to use the access roadway for their transmission line easement south of the site including the portion referred to as Kellet Road. The roadway will be widened and improved to facilitate this access.

- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No. The Cape Horn Trail bus stop at the intersection of State Highway 14 and Salmon Falls Road is approximately 4.5 miles by road southwest from the project area and is served by the Gorge WET Bus system.

- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

None.

- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

Per the recommendations of the attached Transportation Impact Study, McCloskey Creek Road should be widened to a minimum consistent width of 22 feet. The BPA easement road will also be improved to achieve a similar width. Both are gravel roadways.

- e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

- e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Per the attached traffic study, up to 500 daily one-way vehicle trips are assumed, with a peak period volume of 100 trips per hour during AM and PM peak periods. The majority of traffic would be trucks. Traffic volumes, distribution and Level of Service was calculated using the 2016 Highway Capacity Manual (Transportation Research Board), and the 2011 Washington State Department of Transportation's Design Manual. Further details, methodology, and detailed findings and impacts are presented in the attached Transportation Impact Study.

- g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

Based on the conclusions of the attached Transportation Impact Study, traffic in and out of the mine site at peak use meets the Level of Service set forth by Skamania County.

- h. Proposed measures to reduce or control transportation impacts, if any:

None are proposed other than widening a segment of McCloskey Creek Road and improving the private BPA easement roadway.

15. Public Services [\[help\]](#)

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No

- b. Proposed measures to reduce or control direct impacts on public services, if any.

Not applicable.

16. Utilities [\[help\]](#)

- a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system,
other _____

No utilities are currently available at the site.

- f. Describe the utilities that are proposed for the project, the utility providing the service,
and the general construction activities on the site or in the immediate vicinity which might
be needed.

The project has no proposed utility needs.

C. Signature [\[HELP\]](#)

The above answers are true and complete to the best of my knowledge. I understand that the
lead agency is relying on them to make its decision.

Signature: _____



Name of signee B. J. STOREBAHL

Position and Agency/Organization MEMBER / J.L. STOREBAHL & SONS, INC.

Date Submitted: 08/13/21

APPENDIX B

**GEOTECHNICAL ASSESSMENT; SKAMANIA QUARRY; SKAMANIA COUNTY, WASHINGTON
PREPARED BY NV5
DATED AUGUST 17, 2021**

August 17, 2021

J.L. Storedahl and Sons, Inc.
 2233 Talley Way
 Kelso, WA 98626

Attention: Bo Storedahl

Geotechnical Assessment
 Skamania Quarry
 Skamania County, Washington
 Project: Storedahl-12-01

INTRODUCTION

NV5 is pleased to submit this report summarizing our geotechnical assessment of the proposed Skamania Quarry project located approximately 3.5 miles northwest of the community of Skamania off of McCloskey Creek Road in unincorporated Skamania County, Washington. The location of the proposed mine permit boundary is shown on Figure 1.

This report is intended to address Skamania County Code (SCC) Sections 19.07.030 and 19.07.040 for Geologically Hazardous Areas, which require a geotechnical assessment if a subject property contains or is within 100 feet of mapped landslides, scarps, and flanks as documented by the Washington State Department of Natural Resources (DNR) landslide inventory mapping of the area. The absence of additional geologic hazard areas on the site or in its vicinity, as defined by the above code sections, is also documented in this study. This report is intended to provide supporting documentation for J.L. Storedahl and Sons, Inc.'s Conditional Use Permit application with Skamania County for use of the subject property as an aggregate mine.

This report discusses the geologic hazards associated with the existing conditions at the project site and the potential effects to geologic hazards with respect to the proposed mining and reclamation activities. Current slope gradients at the site are shown in Figure 2. The slope gradients, elevation data, and contours presented on Figures 2 through 5 are based on analysis of light detection and ranging (LiDAR) elevation data available from DNR using Esri ArcMap 10.8 software. The geologic hazard areas presented on Figures 3 and 4 are based on data available from DNR's Washington Geologic Information Portal website (2021) as well as geologic hazard mapping completed by Mickelson et al. (2018).

SITE CONDITIONS

GEOLOGIC SETTING

The site is situated on the crest of a southwestern- to northeastern-oriented ridge, with McCloskey Creek running in the adjacent valley to the west. The Columbia River lies 2.25 miles south of the site. The highest elevations on site are found along the site's central axis and the lowest on its flanks, with elevations ranging from approximately 1,840 to 2,340 feet above mean sea level (MSL) across the site. Geologic mapping by Evarts and Fleck (2017) indicates that the site is primarily underlain by a sequence of basalt flows from the Columbia River Basalt Group, which in turn unconformably overlie the upper volcanic member of the Eagle Creek Formation.

The Eagle Creek Formation consists of weakly lithified volcanoclastic rocks and local interbedded lava flows deposited by activity and erosion of the ancestral Cascade Volcanic Arc. The upper volcanic member of the Eagle Creek Formation, as mapped on site, is composed of lithic pyroclastic flow and lahar deposits, along with other sedimentary and volcanoclastic deposits. It has been dated to be approximately 19.5 million years old.

Basalt flows of the Grand Ronde Basalt and the Wampus Basalt cap the stratigraphy at the site, both being members of the Columbia River Basalt Group, which is a voluminous sequence of flood basalts originating in vent complexes centered on present-day southeastern Washington and northeastern Oregon. These basalt flows are typically blocky to columnar in texture and are well exposed along the Columbia River Gorge. These flows are approximately 15 million years old.

Several phases of subsurface drilling were conducted at the site to evaluate aggregate resource potential in 2016 and 2018, including 53 borings on the site to maximum depths in excess of 140 feet below ground surface (BGS). Drilling indicated basalts of the Columbia River Basalt Group extend to at least the maximum depths explored in the northern and southern portions of the site, consistent with the geologic mapping of Evarts and Fleck (2017).

Evarts and Fleck (2017) also map a structural horst bisecting the site from east to west across the central portion of the project area. The older Eagle Creek Formation is upthrown against the younger Columbia River Basalt Group to the north and south.

SURFACE CONDITIONS AND FIELD OBSERVATIONS

An engineering geologist from our office conducted a field reconnaissance on April 1, 2021 to observe the existing site characteristics. Slope gradients derived from LiDAR analysis of existing slopes are presented on Figure 2.

The proposed mine project area has historically been used for forestry, with several prior rounds of harvest, replanting, and regrowth occurring on the property. Currently, the majority of the site has been clear-cut, with the last harvest occurring in phases between 2013 and the present. Clear-cut areas were subsequently replanted. Saplings and juvenile trees now occupy most of the site surface, along with large slash piles and debris from logging. A band of mature timber bisects the northern third of the site, and this was being actively harvested during our reconnaissance. Areas on the periphery of the parcels and adjacent to drainages were left

unharvested by recent logging operations. A small bedrock excavation exists in the south-central portion of the site and has been historically used as a timber pit, providing aggregate for logging roads and staging areas in the vicinity. The excavation exposes hard, fresh to slightly weathered basalt belonging to the Columbia River Basalt Group covered by only a few feet of weathered rock and topsoil.

Much of the slopes along the eastern and western flanks of the northern ridge are 40 percent or greater, with the central and southern portions of the site generally showing slopes of 25 percent or less. Based on our observations of exposed soil and road cuts across the site, topsoil was observed to be approximately 2 feet thick, with subsoil of approximately 2 to 4 feet thick.

A small landslide is mapped by DNR on the western edge of the site, as shown on Figures 3 and 4. Our field observations confirmed the presence of the slide, and its mapped extent is generally accurate. The interpreted scarp and slide mass have been smoothed over by erosion, suggesting it is an ancient feature. We did not observe ground cracking or other indications of recent slide movement. Outcrop exposed by prior timber disturbance near the toe of the slide mass, as well as material excavated by animal burrows in the scarp and slide mass, consisted of tephra, volcanoclastic material, and large blocks of andesite. Based on the geologic mapping by Evarts and Fleck (2017) and their unit descriptions, we believe the slide is located near the northern edge of the structural horst that crosses the site, mapped as the upper member of the Eagle Creek Formation. A small water seep was observed at the toe of the slide.

GROUNDWATER

Based on our review of water well logs available from the Washington State Department of Ecology (DOE), the closest recorded wells to the site were drilled as water sources for residences along McCloskey Creek Road, Kellet Road, and Mabee Mines Road approximately 1.5 miles southwest of the proposed site. Surface elevations of these wells range between 1,450 and 1,650 feet MSL, and static water levels are recorded within a range of 20 to 480 feet BGS, with most static water levels ranging between 20 and 50 feet BGS. Current plans call for mining to a maximum depth of 2,050 feet MSL, which is significantly higher than water levels observed in adjacent wells and the surface groundwater elevation in McCloskey Creek, west of the site. No consistent, permanent groundwater table was encountered in the subsurface borings drilled at the site. Based on this information and the site's location on a relatively isolated topographic high, we do not consider local groundwater to be a contributing factor to geologic hazards at the proposed site.

Perched water is likely to be encountered in geologic zones of reduced permeability during the wet season, where rainwater can infiltrate and temporarily mound atop less permeable units. The seep observed at the far toe of the landslide during our surface reconnaissance is typical of this phenomenon, and some of the borings encountered isolated water levels at varying depths. We interpret these features to represent locally perched water and not a contiguous aquifer or site-wide water level.

SURFACE WATER

Surface runoff on site is currently split between McCloskey Creek to the west and several streams located northeast, east, and south of the site. Proposed mine stormwater plans call for the collection of runoff from all disturbed areas to be directed inward to infiltrate in the floor of the mine. Current plans place a 200-foot or greater buffer zone between the proposed permit boundary and nearby water bodies and wetlands in the vicinity (Figures 2 through 4), and even greater distance from proposed surface disturbance. The seep mapped at the base of the DNR-mapped slide is greater than 500 feet from the edge of proposed mining disturbance on site.

GEOLOGICALLY HAZARDOUS AREAS

Geologically hazardous areas identified in SCC 19.07.010 include erosion hazard areas, landslide hazard areas, seismic hazard areas, and volcanic hazard areas. SCC 19.07.040 further outlines specific criteria for landslide hazard reporting and evaluation. This report has been prepared to address these criteria and discuss each of the regulated hazards.

EROSION HAZARD AREAS

According to SCC 19.07.010(A), erosion hazard areas correspond to areas identified by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) as having “severe” or “very severe” erosion susceptibility. According to USDA NRCS, three soils are mapped on site: Skoly stony loam, 2 to 15 percent slopes; Skoly stony loam, 30 to 65 percent slopes; and Mountzion clay loam, 2 to 15 percent slopes. These soils are characterized as having only “slight” (Skoly) to “moderate” (Mountzion) potential for erosion hazard. As such, these soils do not have “severe” or “very severe” erosion susceptibility.

The proposed mining will disturb fine-grained soil in the project area and potentially make it susceptible to erosion. In accordance with standard mining practices and requirements from DNR, all topsoil within the mined area will be stored in stockpiles and vegetated to stabilize the piles from erosion. Removal of vegetation and topsoil will occur in discrete phases in advance of segmental mining of the site, and re-distribution and re-vegetation of topsoil will occur as portions of the mine are exhausted, with the intent of returning affected areas back to use as timber lands. Recommendations for stabilizing temporary soil stockpiles are provided below.

LANDSLIDE HAZARD AREAS

Landslide hazard areas are defined under SCC 19.02, with additional applicable standards defined in SCC 19.07.010. DNR (2021) mapping and our field observations indicate a small, shallow landslide is located on the western edge of the proposed site, as shown in Figures 3 and 4. At distances greater than 100 feet east of the proposed site, the head scarp of a much larger, deep-seated failure is well defined and mapped by multiple sources (DNR, 2021; Evarts and Fleck, 2017) as part of a massive landslide complex associated with erosion along the Columbia River. Other landslide features were not noted in our field observations, nor in mapping completed by DNR. We discuss these landslide hazards in the “Conclusions and Recommendations” section.

SEISMIC HAZARD AREAS

Seismic hazard areas are defined under SCC 19.02 as areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, soil liquefaction, debris flows, or lahars. SCC Section 19.07.010(C)1 additionally qualifies seismic hazard areas based on seismic design category maps created by DNR. Based on the Site Class Map of Skamania County, Washington (Palmer et al., 2004), the site is mapped as Site Class B, which does not indicate a severe risk for ground shaking amplification, slope failure, or settlement. The mapped hazard for liquefaction is classified as “not applicable” due to the presence of shallow bedrock. No active faults are mapped by the U.S. Geological Survey (USGS) (2017) within the site area; fault rupture is not considered a hazard for the site.

VOLCANIC HAZARD AREAS

Volcanic hazard areas regulated under SCC 19.07 include near-volcano hazards and lahar zones as mapped by USGS. Based on USGS hazard mapping presented on DNR’s (2021) Geologic Information Portal website, the site is not mapped in either zone.

CONCLUSIONS AND RECOMMENDATIONS

Based on our research and site observations, it is our opinion that the proposed mine project will not have a significant impact on the geologic hazard areas identified on site and in the vicinity. The massive landslide complex to the east associated with the Columbia River is significantly far from the proposed project, which will remove material through mining from areas upslope of the headscarp and thus reduce driving forces that might affect landslide stability. The smaller landslide hazard mapped by DNR at the site can be effectively mitigated by employing the mine plan presented on Figures 3 through 5 and implementing the recommendations summarized below.

ON-SITE LANDSLIDE

We interpret the small landslide mapped on the western edge of the site to be an ancient feature that does not show indications of recent displacement. We recommend the proposed mine project avoid the headscarp area of this feature and not place materials near the headscarp, which could add weight and possibly cause retrogression of the scarp.

The proposed mine plan presented on Figures 2 through 5 follows our recommendations. A minimum 50-foot setback has been incorporated into the plan between the top of the small landslide headscarp to the proposed limits of the mine excavation and operations area to prevent mine activity from affecting the scarp. Additionally, grading of the operations area and mining in the northern portion of the site near this feature will be conducted by removing material, thus reducing potential driving forces for possible additional sliding.

SLOPE RECOMMENDATIONS

Based on our observations of exposed basalt in the current timber pit and from extensive drilling of the site, benched highwalls in basalt bedrock are likely to be competent and stable over the life cycle of the mine. Final slopes for the proposed mine should be completed at gradients of 2H:1V as shown on Figures 4 and 5.

A temporary overburden and topsoil stockpile is proposed for the eastern-central sloped area shown on Figures 2 through 5. Vegetation should be cleared and topsoil removed from the area and separately stockpiled before the overburden soil is placed. Where the temporary stockpile will be placed over existing slopes greater than 15 percent, the ground surface should be graded into a benched geometry to avoid slide-plane development below the fill. Slopes for the temporary overburden and topsoil stockpile should be constructed at a gradient of 3H:1V or flatter, which is shown on Figure 5. This gradient is equivalent to the natural slope below the proposed fill location.

Final reclaimed slopes may receive overburden backfill to lessen slope gradients and promote revegetation of the final slopes, depending on the amount of overburden soil encountered and distributed around the site during mining. Final slopes that receive overburden backfill should vary between 2H:1V and 3H:1V. Reclamation fill slopes should be placed in lifts using bulldozers or other heavy equipment and track compacted into place to a firm, unyielding condition. Lifts should generally not exceed 2 feet in thickness. If the fill material has significant fines, it should be placed during dry weather or when not excessively above optimum moisture content.

STORMWATER MANAGEMENT

Stormwater from the mine disturbance area should be routed away from the top of steep slopes to avoid decreasing slope stability. Surface water drainage from the proposed topsoil storage and operations area should be routed to the northern mine excavation to the greatest extent possible and then to the mine floor. Stormwater in extraction areas should be directed to the interior of the mined excavation and then to the floor for infiltration. Figure 4 shows the final site topography at the completion of mining in accordance with these recommendations.

Best management practices (BMPs) should be implemented to reduce or control erosion before the site is disturbed. Stormwater plans will be required as part of the DNR Surface Mine Reclamation Permit and the DOE Sand and Gravel General Permit for the mine, which will identify stormwater control measures and BMPs to control stormwater and prevent soil from leaving the site by erosion.

STABILIZING SOIL STOCKPILES

Temporary stockpiles of topsoil and overburden soil intended to be left in place for more than one week should be stabilized to prevent soil loss and erosion. Stockpiles can be seeded with erosion control grass mixture or mulched with weed-free straw or compost. Seeding should take place as soon as practical following stockpile placement.

PRESERVE VEGETATION

The proposed mine plan includes clear limits for mining disturbance to preserve undisturbed vegetated buffers outside of the mining. Vegetation should be preserved on slopes outside the mine area to stabilize soil from erosion and to comply with existing reclamation requirements.

LIMITATIONS

We have prepared this report for use by J.L. Stordahl and Sons and members of the design and construction teams for the proposed mining and reclamation of the site, and for obtaining land

use approval for same. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to areas other than the subject property.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in this report for consideration in design.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time the report was prepared. No warranty, express or implied, should be understood.

◆ ◆ ◆

Please call if you have questions concerning this report or if we can provide additional services.

Sincerely,

NV5



John C. Hook
Technical Specialist/Geologist



Erick J. Staley, L.E.G.
Principal Engineering Geologist



Erick J. Staley



Signed 08/17/2021

JCH:EJS:sn

Attachments

One copy submitted (via email only)

Document ID: Storedahl-12-01-081721-geolr-geohaz.docx

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FIGURES

T 2 N

6			1
31			36

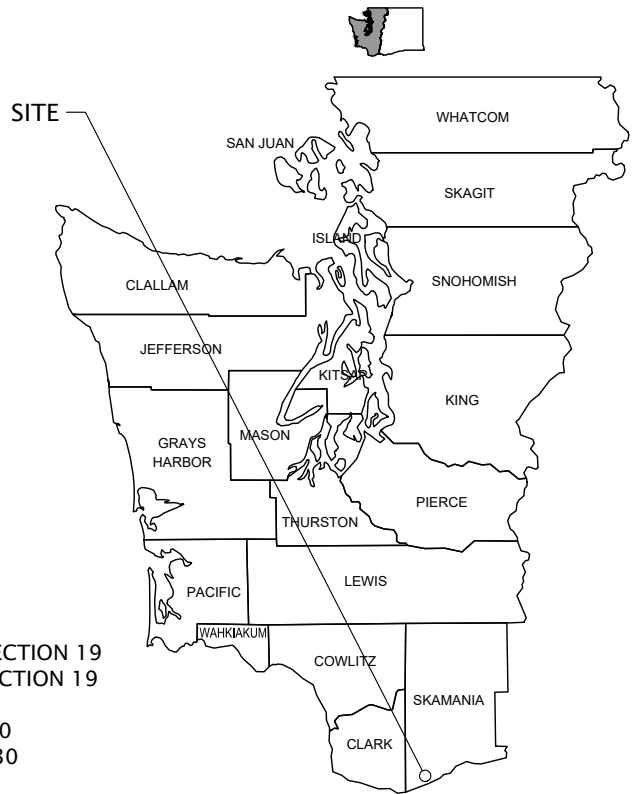
R 6 E

SITE COORDINATES:

LATITUDE: 45° 38' 24" N

LONGITUDE: 122° 6' 43" W

WESTERN WASHINGTON



DIRECTIONS TO SITE

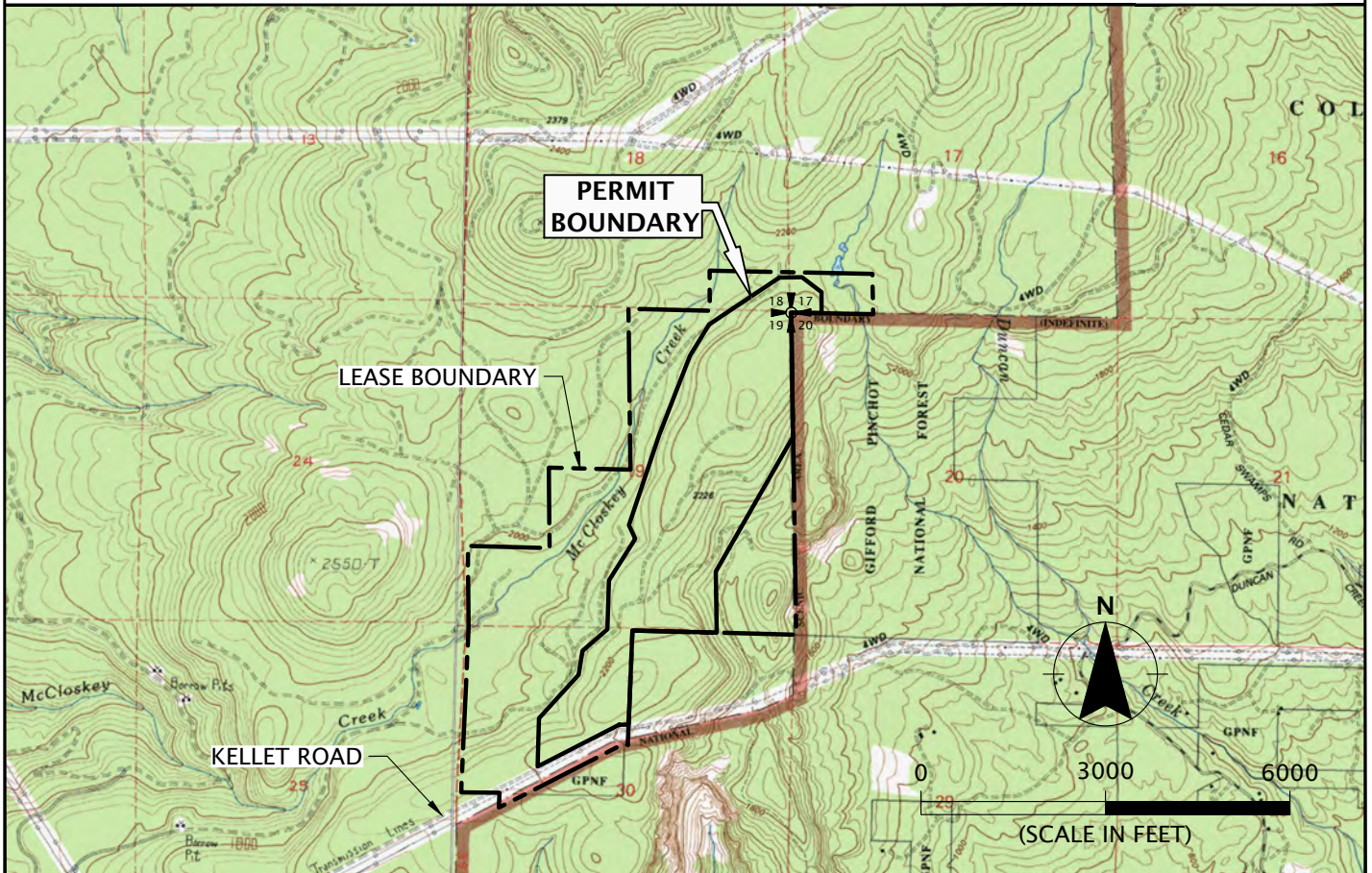
SKAMANIA QUARRY IS LOCATED NORTHEAST OF WASHOUGAL, WA. FROM WASHOUGAL, DRIVE EASTBOUND ON HIGHWAY 14 FOR APPROXIMATELY 8 MILES. TURN LEFT (NORTH) ONTO SALMON FALLS ROAD. DRIVE NORTHBOUND FOR ROUGHLY 1 MILE, THEN TURN RIGHT (EAST) ONTO MABEE MINES ROAD. FOLLOW MABEE MINES ROAD FOR APPROXIMATELY 2 MILES, THEN TURN RIGHT ONTO KELLET ROAD. FOLLOW KELLET ROAD FOR APPROXIMATELY 1.75 MILES. SKAMANIA QUARRY IS LOCATED ON THE LEFT (NORTHERN) SIDE OF KELLET ROAD.

LEGAL DESCRIPTION

THE PERMIT BOUNDARY IS LOCATED IN PORTIONS OF THE FOLLOWING QUARTER-QUARTER SECTIONS:

- SW QUARTER OF THE SW QUARTER OF SECTION 17
- SE QUARTER OF THE SE QUARTER OF SECTION 18
- NW, NE, SE, AND SW QUARTERS OF THE NE QUARTER OF SECTION 19
- NW, NE, SE, AND SW QUARTERS OF THE SE QUARTER OF SECTION 19
- SE QUARTER OF THE SW QUARTER OF SECTION 19
- NE AND SE QUARTERS OF THE NW QUARTER OF SECTION 30
- NW AND SW QUARTERS OF THE NE QUARTER OF SECTION 30

NOTE: USGS TOPOGRAPHIC QUADRANGLE MAP REPRODUCED USING MAPTECH TERRAIN NAVIGATOR PRO®.



STOREDAHL & SONS, INC.

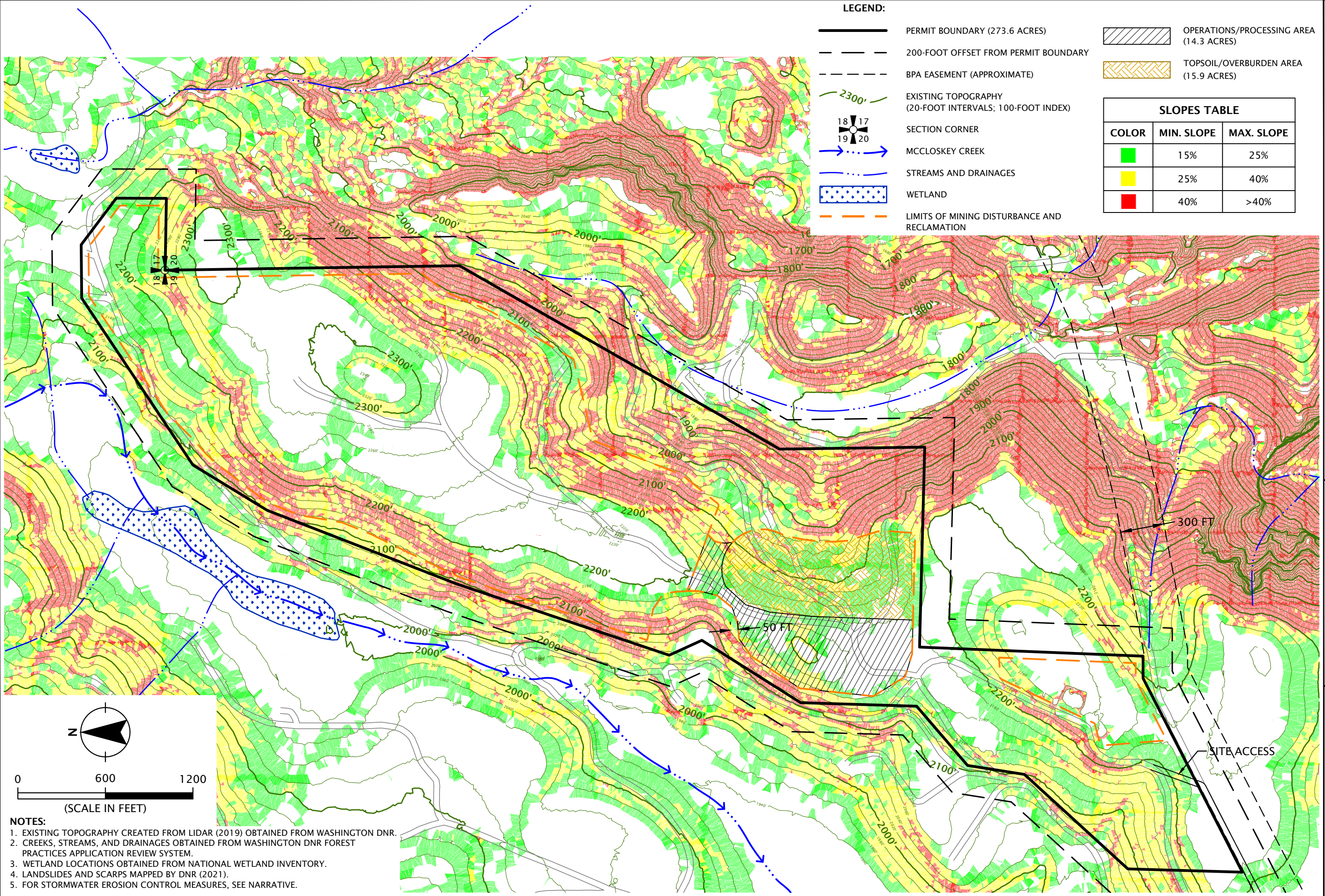
VICINITY MAP
SKAMANIA QUARRY

STOREDAHL-12-01
AUGUST 2021

SKAMANIA COUNTY, WA
SECS. 17, 18, 19 & 30, TOWNSHIP 2N, RANGE 6E, W.M.

FIGURE 1

Printed By: mmiller | Print Date: 8/17/2021 10:17:23 AM
 File Name: J:\S-Z\Storedahl\Storedahl-12-01_Sp07.dwg | Layout: FIGURE 2

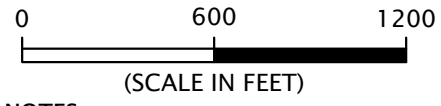
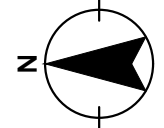


LEGEND:

- PERMIT BOUNDARY (273.6 ACRES)
- 200-FOOT OFFSET FROM PERMIT BOUNDARY
- BPA EASEMENT (APPROXIMATE)
- EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX)
- SECTION CORNER
- MCCLOSKEY CREEK
- STREAMS AND DRAINAGES
- WETLAND
- LIMITS OF MINING DISTURBANCE AND RECLAMATION
- OPERATIONS/PROCESSING AREA (14.3 ACRES)
- TOPSOIL/OVERBURDEN AREA (15.9 ACRES)

SLOPES TABLE

COLOR	MIN. SLOPE	MAX. SLOPE
	15%	25%
	25%	40%
	40%	>40%



- NOTES:**
- EXISTING TOPOGRAPHY CREATED FROM LIDAR (2019) OBTAINED FROM WASHINGTON DNR.
 - CREEKS, STREAMS, AND DRAINAGES OBTAINED FROM WASHINGTON DNR FOREST PRACTICES APPLICATION REVIEW SYSTEM.
 - WETLAND LOCATIONS OBTAINED FROM NATIONAL WETLAND INVENTORY.
 - LANDSLIDES AND SCARPS MAPPED BY DNR (2021).
 - FOR STORMWATER EROSION CONTROL MEASURES, SEE NARRATIVE.

EXISTING CONDITIONS - SLOPE GRADIENT MAP

SKAMANIA QUARRY

SKAMANIA COUNTY, WA

SECS. 17, 18, 19 & 30, TOWNSHIP 2N, RANGE 6E, W.M.

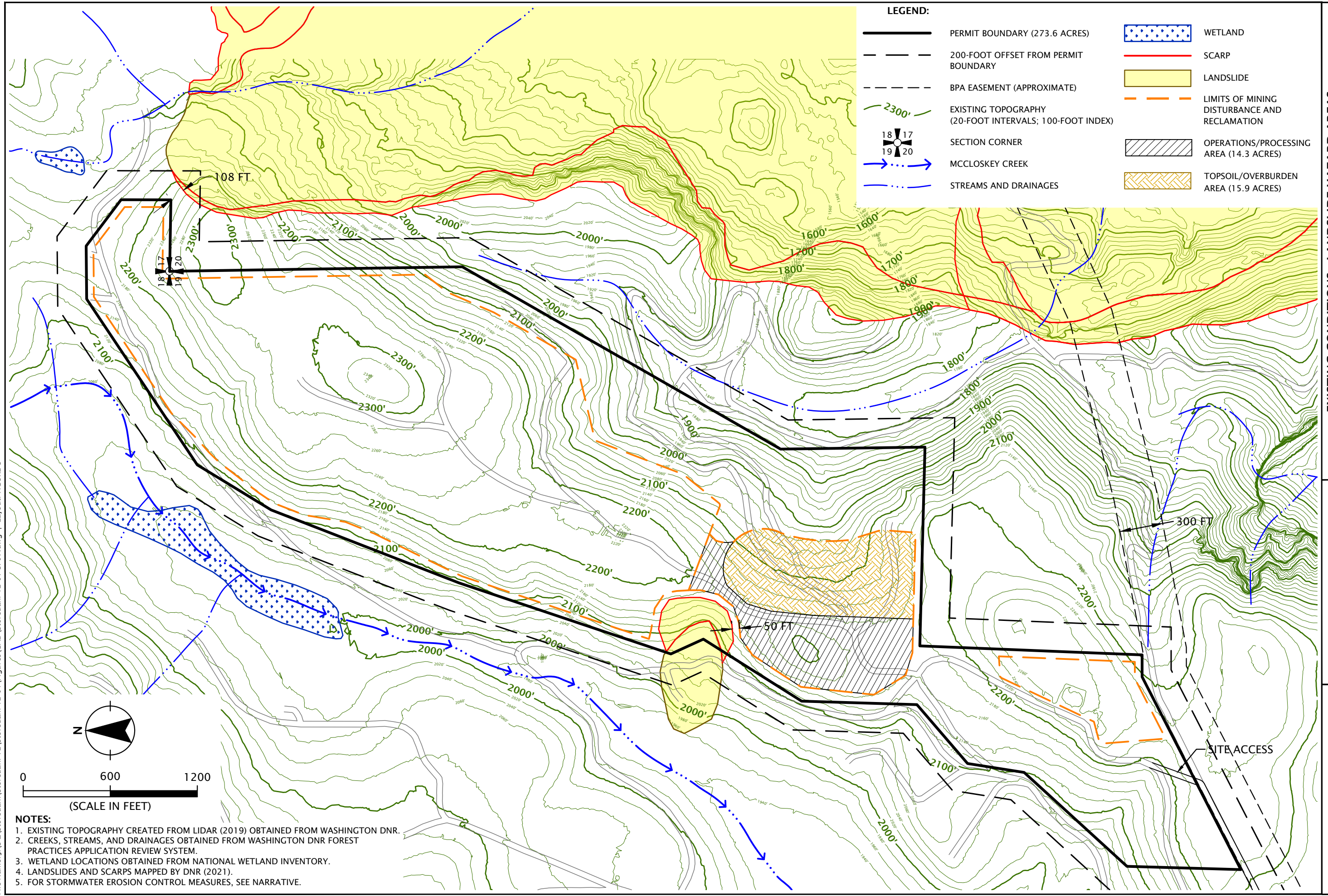
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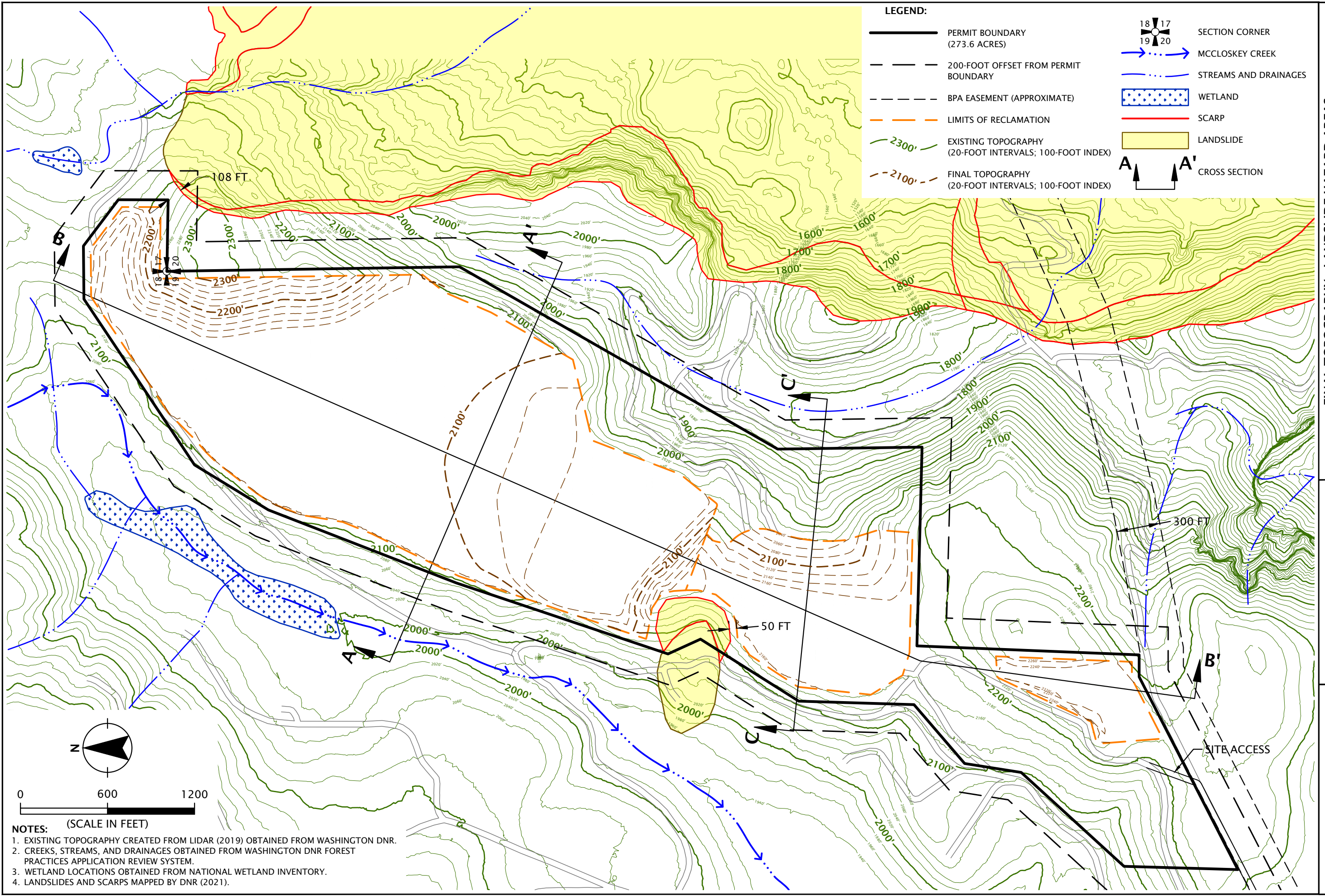
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AUGUST 2021



FIGURE 2

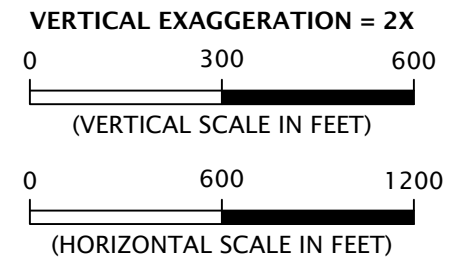
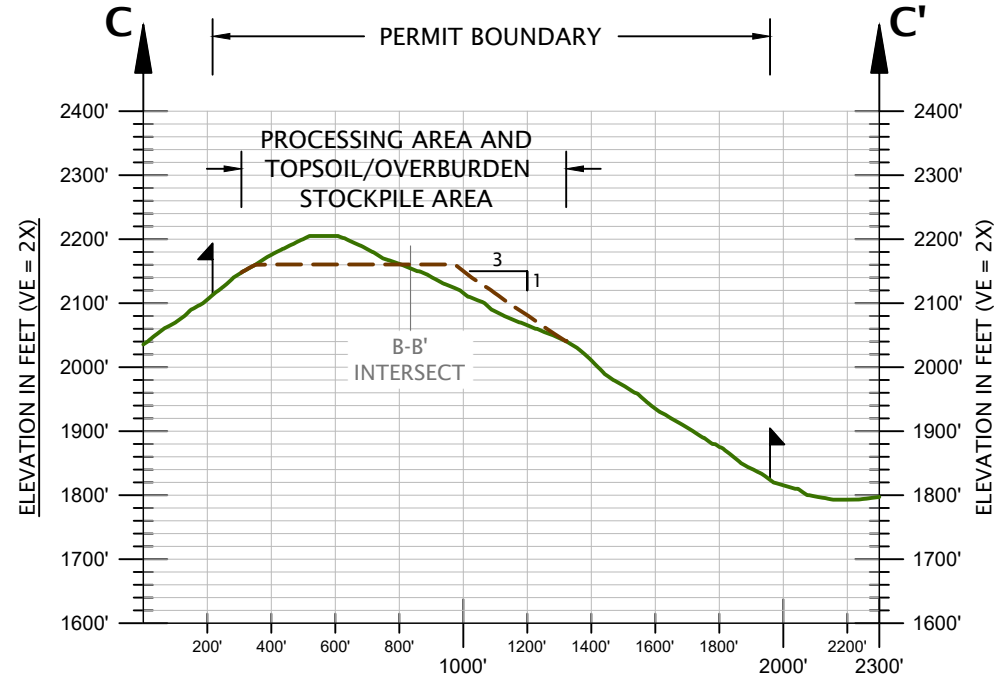
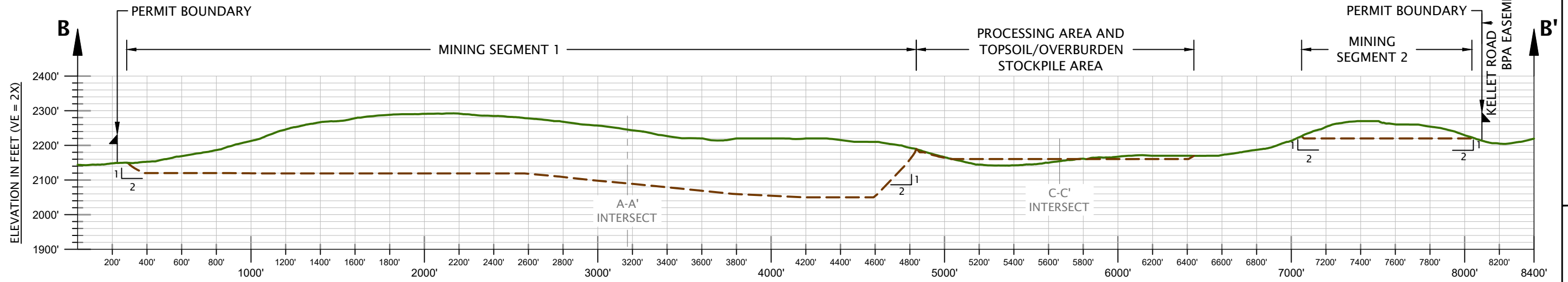
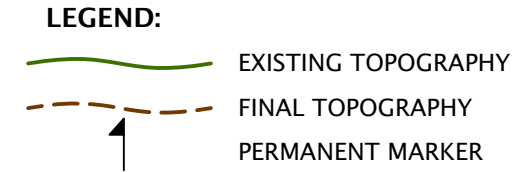
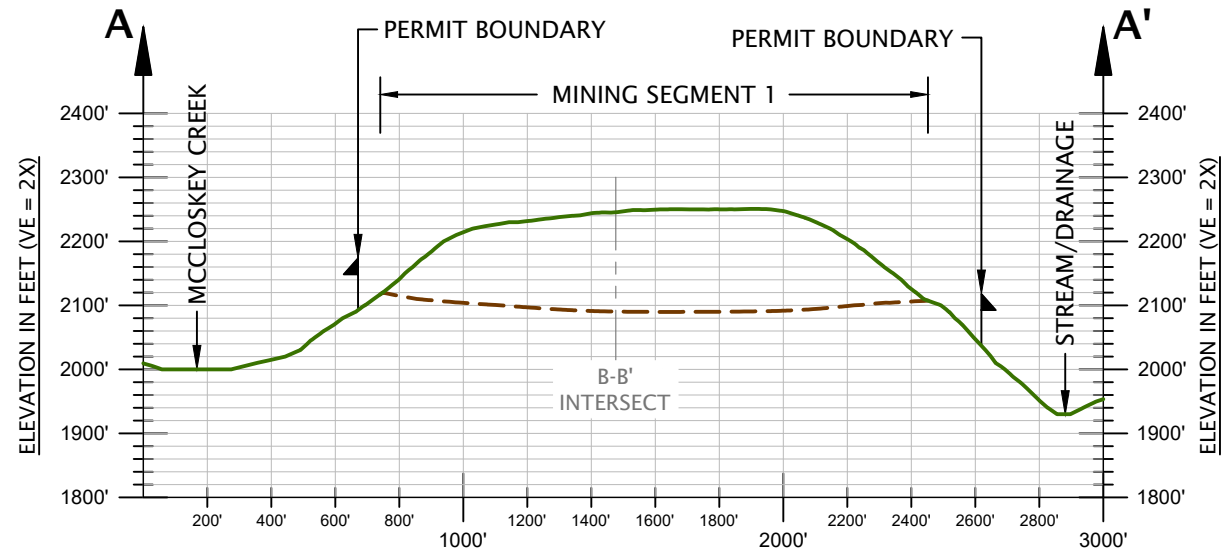




FINAL TOPOGRAPHY - LANDSLIDE HAZARD AREAS
 SKAMANIA QUARRY

STOREDAHL & SONS, INC.
 STOREDAHL-12-01
 AUGUST 2021





APPENDIX C

**SKAMANIA QUARRY; TRANSPORTATION IMPACT STUDY
PREPARED BY DKS
DATED FEBRUARY 19, 2020**

SKAMANIA QUARRY

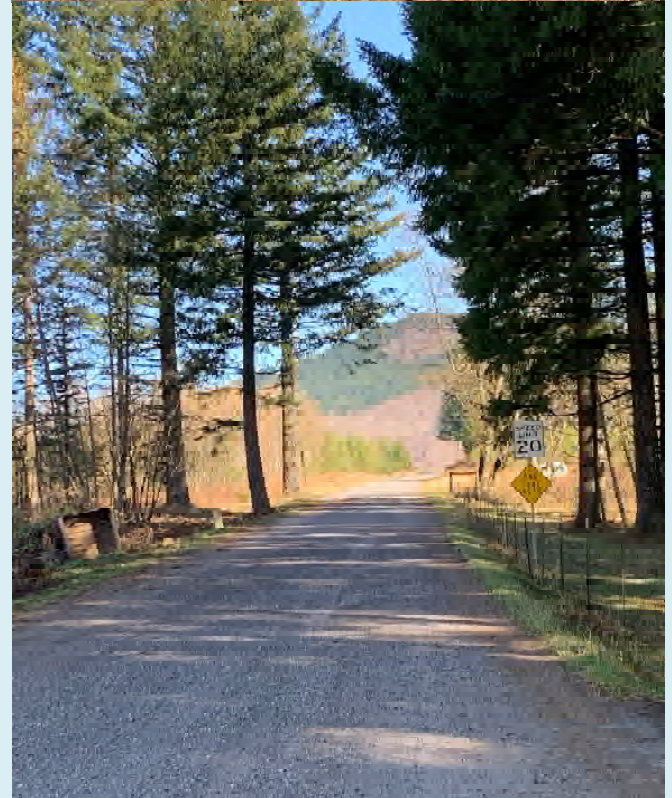
TRANSPORTATION IMPACT STUDY

Prepared for:
J.L. Storedahl and Sons, Inc.

Prepared by:



FEBRUARY 19, 2020





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BACKGROUND

A new rock quarry is being proposed in Skamania County, Washington. The report presents the transportation impact analysis and findings associated with the proposed development. The analysis investigated potential operational and safety impacts along Salmon Falls Road just north of Highway 14. The quarry would be located near the end of Mabee Mines Road, to the northeast. The impact analysis included an evaluation of study intersection operations for the year 2022 without and with the proposed project. The identified project impacts and recommended mitigations are presented in the following sections.

EXISTING CONDITIONS

The existing conditions section has been compiled to include an evaluation of the study area and descriptions of the study area roadway network, traffic volumes and operations. Collision data at study area intersections has also been summarized for the prior five years of full data.

Study Area Roadway Network

The roadway network analyzed included roads under the jurisdiction of Skamania County and Washington State Department of Transportation (WSDOT). Figure 1 shows the roadway network in the study area and the locations of the study intersections. A field visit was conducted on Tuesday November 5, 2019 to inventory roadway characteristics, pavement markings, traffic control type and observe peak period vehicle operations and safety. The study intersections included:

- Salmon Falls Road/ Highway 14
- Salmon Falls Road/ Canyon Creek Road/ Ryan-Tavelli Road
- Salmon Falls Road/ Mabee Mines Road

Three roadway sections were also analyzed for roadway conditions and measurements. These segments and their study lengths are:

- McCloskey Road - Proposed site access to Mabee Mines Road (0.7 miles)
- Mabee Mines Road - McCloskey Road to Salmon Falls Road (2.2 miles)
- Salmon Falls Road - Mabee Mines Road to Highway 14 (0.8 miles)



Figure 1: Study Area

Pedestrian Facilities

Pedestrians were counted with the study intersection turn movement data collected October 22, 2019 and no pedestrian activity was observed throughout the study area. There were no pedestrian facilities (such as sidewalks, ramps) at any of the study intersections during the morning or evening peak hours.

Bicycle Facilities

Bicycle facilities in the form of bike lanes or wide shoulders are not provided at any of the study intersections. Bicyclists were counted in the study intersection turn movement data collected October 22, 2019. No bicyclists were observed to ride through the study intersections during the morning or evening peak hours.



Roadway Facilities

Roadway Cross Sections

Cross sections were measured in the field for each study roadway segment. The roadway measurement represents the width of the paved roadway (not including gravel or dirt shoulder area). McCloskey Road, which is a single lane road, was measured to be between 16 to 20 feet, a width that was inconsistent along the length of the roadway.

From the field visit, it appeared that a 12-foot wide travel lane in each direction was present for the entire length of the Mabee Mines Road and Salmon Falls Road study segments. A 12-foot lane provides desirable clearances between large commercial vehicles traveling in opposite directions on straight two-lane, two-way rural highways when either high traffic volumes or high percentages of trucks are expected.¹

Shoulders

Along the three study roadway segments, no shoulders were present, except for Mabee Mines Road, which occasionally had a small compacted gravel shoulder.

Signing

Roadway signing along the study segments consisted of regulatory signs, warning signs, and guide signs. The majority of regulatory signs observed were STOP signs and SPEED signs, as well as signs indicating limited sight distance. McCloskey Road is signed to indicate that it is a single lane road. All signing appeared to be in good condition.

Pavement Markings

Pavement markings in good condition were observed along the length of the study roadway segments. The edge of pavement lines (fog lines) were present and clearly visible on both sides of the roadways. Centerline pavement markings and sign inventory can be seen in Figure 2. The centerline markings appeared to be correctly applied based on the roadway's horizontal and vertical curves. Figures 3 and 4 shows an example of the pavement markings within the study area.

¹ *Geometric Design of Highways and Streets*, Fifth Edition, Chapter 4 Cross Section Elements, page 311, American Association of State Highway and Transportation Officials (AASHTO), Washington, D.C., 2004.

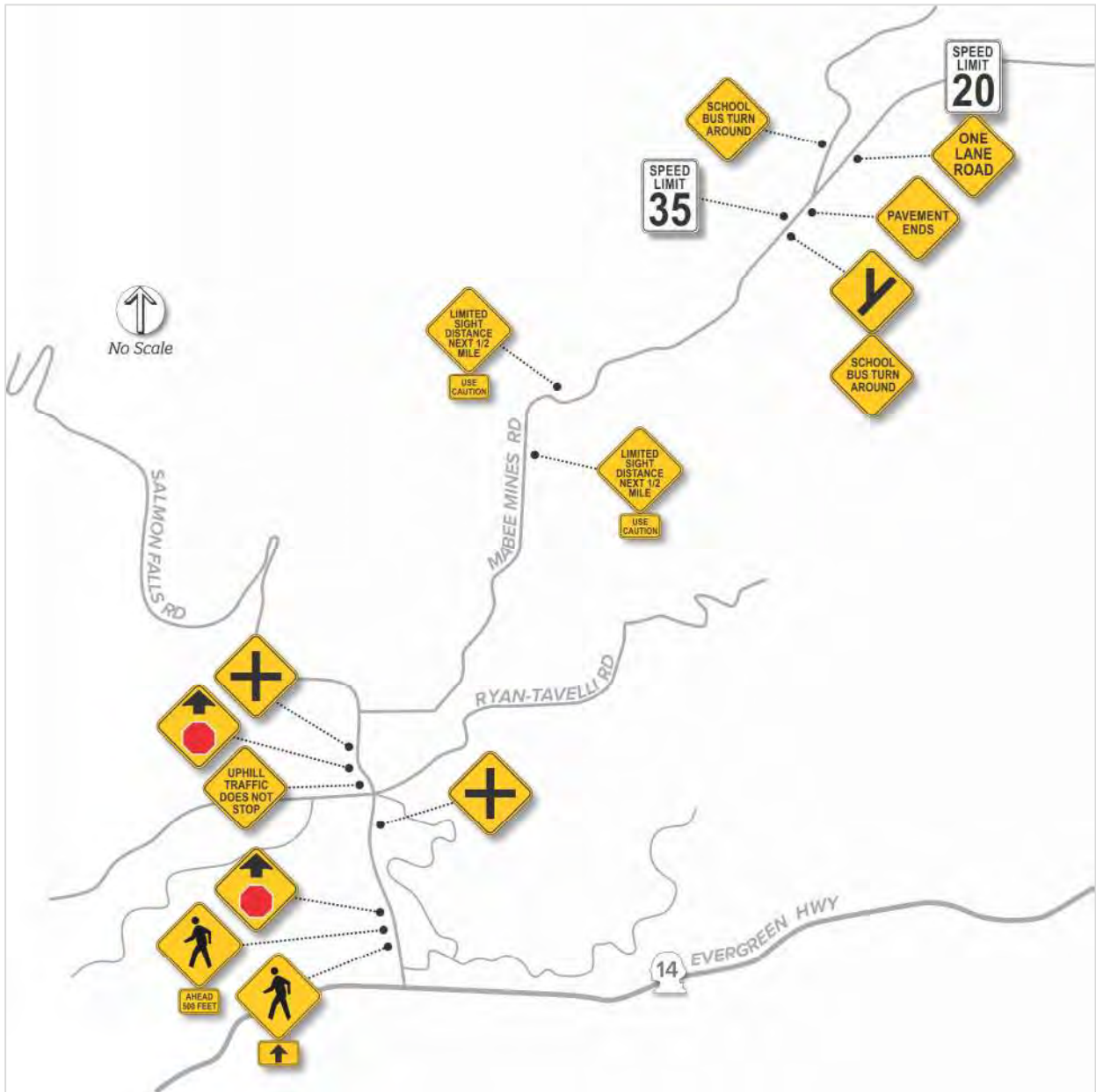


Figure 2: Sign Inventory and Centerline Pavement Markings



Figure 3: Example of Pavement Markings



Figure 4: Example of Pavement Markings

Pavement Conditions

The general pavement conditions along the corridor were noted as part of the field work performed. The existing pavement condition along Mabee Mines Road and Salmon Falls Road was in good condition. The pavement was generally smooth, with limited signs of surface distress. McCloskey Road was a compacted gravel one-lane road, as shown in Figure 5.



Figure 5: McCloskey Road



Sight Distance

Stopping sight distance and intersection sight distance were evaluated along the study roadway segments. Stopping sight distance is the space needed for a vehicle travelling at or near the design speed to stop before reaching a stationary object in its path. Intersection sight distance is the space needed for a driver accessing the major roadway from a minor roadway to make a left turn onto the major roadway and accelerate without unduly slowing oncoming traffic.

The sight distance evaluation was based on AASHTO sight distance requirements.² The evaluation identified a potential vertical sight distance issue at the intersection of Salmon Falls Road and Canyon Creek Road-Ryan Tavelli Road. There was an upward grade in the northbound direction. However, all approaches are stop sign controlled except for the northbound approach. No other sight distance issues were identified.

Motor Vehicle Volumes

Weekday motor vehicle turn movement counts³ were collected at the study intersections in October 2019. The raw count data was adjusted to represent seasonal high volumes for use in the operational analysis. The seasonal factor applied was calculated using available data from the closest WSDOT permanent traffic recording stations on SR 14 (at mile post 17.70). The seasonal adjustment factor for counts conducted in October is 1.00.⁴ This factor was applied to the SR 14 and Salmon Falls Road intersection counts.

No seasonal factor was applied to the remaining study intersections. The study intersections under County jurisdiction and were conducted in October when traffic volumes were estimated to be seasonally stable with little variation due to weather or recreation users. Figure 6 shows the motor vehicle turn movement volumes for the study area intersections with season adjustments (as applicable).

² AASHTO – *Geometric Design Highways and Streets*, 6th edition, 2011.

³ Traffic counts were conducted by Quality Counts on Tuesday, October 22, 2019 during the morning (6:00 to 8:00 a.m.) and evening (4:00 to 6:00 p.m.) peak periods.

⁴ 2016 Annual Traffic Report, Washington State Department of Transportation.

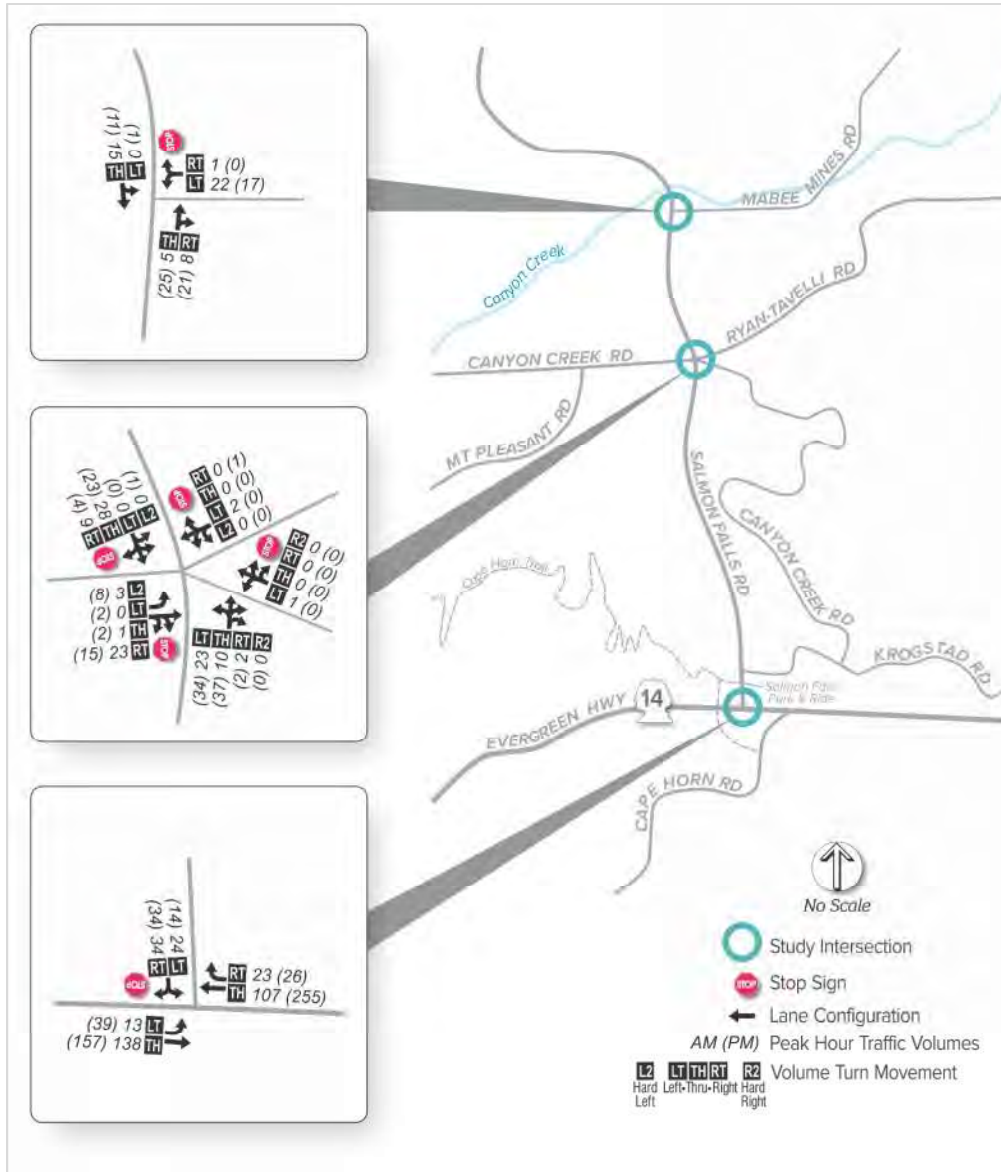


Figure 6: Existing Year 2019 Vehicle Volumes

Truck Volumes

Truck volumes entering the study intersections were recorded as part of the motor vehicle counts conducted on October 22, 2019. Figure 7 shows the total entering volume of trucks. The highest volume of vehicles and trucks was recorded at the intersection of SR 14 and Salmon Falls Road. The lowest volume of vehicles and trucks was recorded at the intersection of Salmon Falls Road, Canyon Creek Road and Ryan-Tavelli Road.

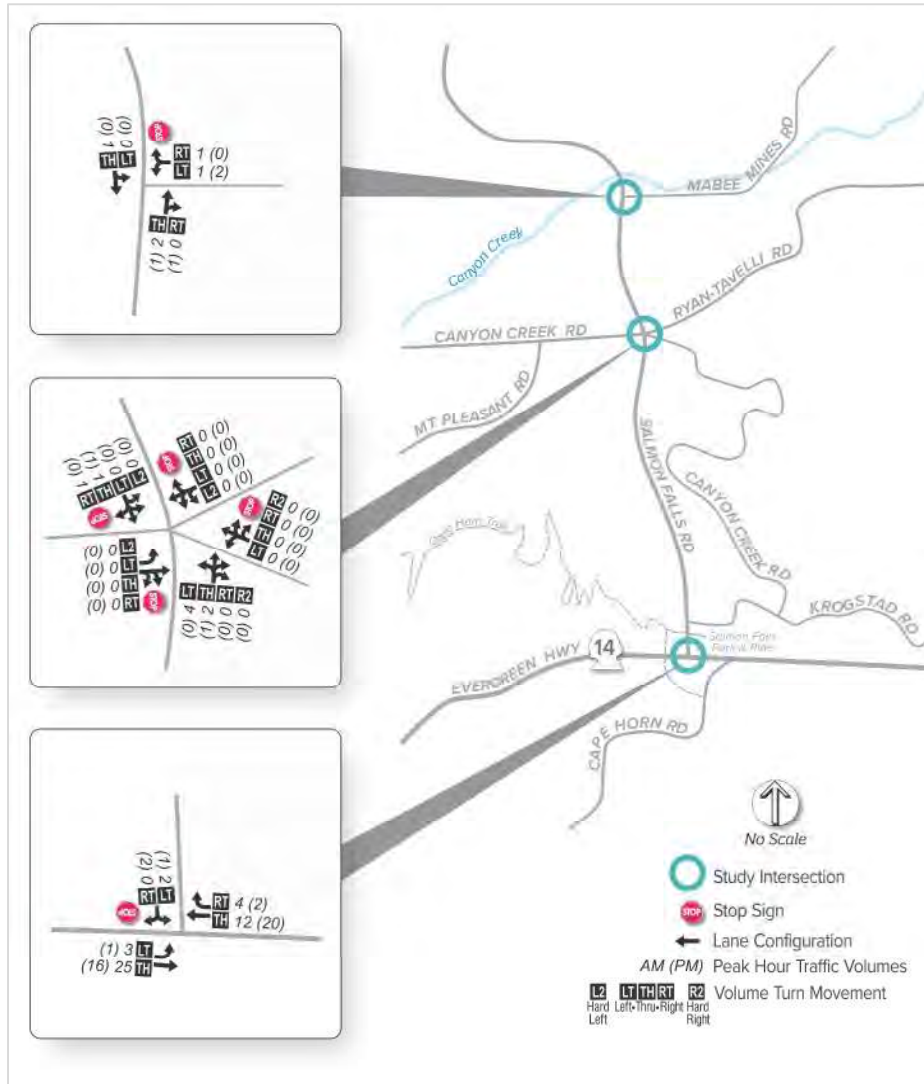


Figure 7: Existing Heavy Vehicle Volumes



Study Intersection Operational Analysis

An operational analysis of existing conditions was performed for the study intersections using the vehicle volumes developed for the morning and evening peak hours. This analysis includes a rating of the intersection’s performance based on average motor vehicle delay, a level of service (LOS), and a ratio of the volume of vehicles to the capacity of the intersection. Existing LOS was calculated using Synchro 10 software, which follows the *Highway Capacity Manual* (HCM) 6 methodology⁵.

An intersection’s LOS is similar to a “report card” rating, based on average vehicle delay. LOS A, B, and C indicate conditions where vehicles can move freely. Level of service D, E and F are progressively worse. Skamania County uses WSDOT level of service standards for determining the operating adequacy of both signalized and unsignalized intersections. The standard is LOS C in rural areas.⁶

It is important to understand that LOS for unsignalized intersections is computed differently and based on different criteria than signalized intersections. Whereas signalized intersection analysis provides an overall assessment of intersection or approach operating conditions, unsignalized intersection analysis provides LOS for individual movements at an intersection. At many unsignalized intersections, the majority of through moving vehicles on the major street travel through without any delay. The LOS designation of an unsignalized intersection is the LOS of the major street followed by the LOS of the minor street.

Volume to capacity ratio (v/c) is similar to LOS but is a ratio of the volume of vehicles traveling through an intersection to its calculated capacity. The v/c ratio is also an indicator of the amount of intersection capacity being used by traffic demand. A v/c ratio of 0.70 indicates that 70% of the intersection capacity is currently being used.

Table 1 shows the existing intersection performance (delay, LOS, and volume-to-capacity ratio) measures for the morning and evening peak hours. Under the existing conditions, intersection performance standards have been met at all the locations. Traffic count data and the HCM results are included in the Appendix.

Table 1: Existing Intersection Operations

Intersection	Morning Peak Hour			Evening Peak Hour			Agency Standard	Intersection Control
	Delay	LOS	V/C	Delay	LOS	V/C		
Evergreen Hwy (SR 14) and Salmon Falls Rd	7.8/9.9	A/A	0.01/0.08	8.0/11.0	A/B	0.03/0.08	C	Unsignalized 1-way stop
Salmon Falls Rd and Mabee Mines Rd	0.0/8.8	A/A	0.00/0.03	7.3/9.0	A/A	0.00/0.02	C	Unsignalized 1-way stop
Salmon Falls Rd, Canyon Creek Rd, and Ryan-Tavelli Rd	7.4/9.4	A/A	0.02/0.05	7.3/9.6	A/A	0.02/0.03	C	Unsignalized 4-way stop (NB Salmon Falls Rd does not stop)

Delay = Average delay per vehicle

LOS = Level of Service

Signalized (X) = Average LOS for intersection

Unsignalized (X/X) = Major Street/Minor Street

v/c = volume to capacity ratio

Agency Standard applied to mainline and minor street approaches

⁵ 2016 *Highway Capacity Manual*, Transportation Research Board, Washington, D.C. 2016.

⁶ *Design Manual*, Washington State Department of Transportation, Olympia, WA, 2011



Study Intersection Collision Analysis

A collision analysis was conducted for the study intersections. Collision data for the study intersections was obtained from WSDOT for the period from 2014 through 2019. The collision data and 2019 traffic counts were used to calculate the collision rates at the study intersections. Table 2 summarizes the collisions experienced at each study intersection, and the resulting collision rate in the number of collisions per million vehicles entering the intersection.

Within the study area, none of the study intersections had a collision rate higher than 1.0. Therefore, there is no indication of a safety problem at the study intersections.

Table 2: Collision Data Summary by Intersection (2014 through 2019)

Intersection	PDO	Injury	Fatal	Total	Collision Rate
Salmon Falls Rd @Canyon Creek Rd/Ryan Tavelli Rd	1	0	0	0	0.365
Canyon Creek Rd (west leg) @Salmon Creek Rd	0	0	0	0	0
Ryan Tavelli Rd (east leg) @Salmon Creek Rd	0	0	0	0	0
Salmon Falls Rd @ Mabee Mines Rd	0	0	0	0	0
Salmon Falls Rd @SR 14	0	0	0	0	0
SR 14 @Salmon Falls Rd	1	1	0	0	0.166

Note: Collision Rate is expressed in Collisions per Million Entering Vehicles

PDO = A collision that resulted in Property Damage Only

Injury = A collision that resulted in an injury

Fatal = A collision that resulted in a fatality



FUTURE 2022 CONDITIONS ANALYSIS

The future year 2022 conditions analysis includes a description of the reasonably funded projects assumed to be in place in the future, estimate of trip generation, trip distribution and study intersection operational analysis for the Baseline and Proposed Project Conditions scenarios.

There were no identified funded transportation projects within the study area.

2022 Baseline Conditions Analysis

Future volume forecasts for the Baseline Conditions were developed using a growth rate of one percent per year. Figure 8 shows the future 2022 Baseline Condition volumes at the study intersections with this applied growth rate.

Truck volumes for the future scenarios were developed similarly to the motor vehicle volumes. Figure 9 shows the truck volumes for the future 2022 Baseline Conditions.

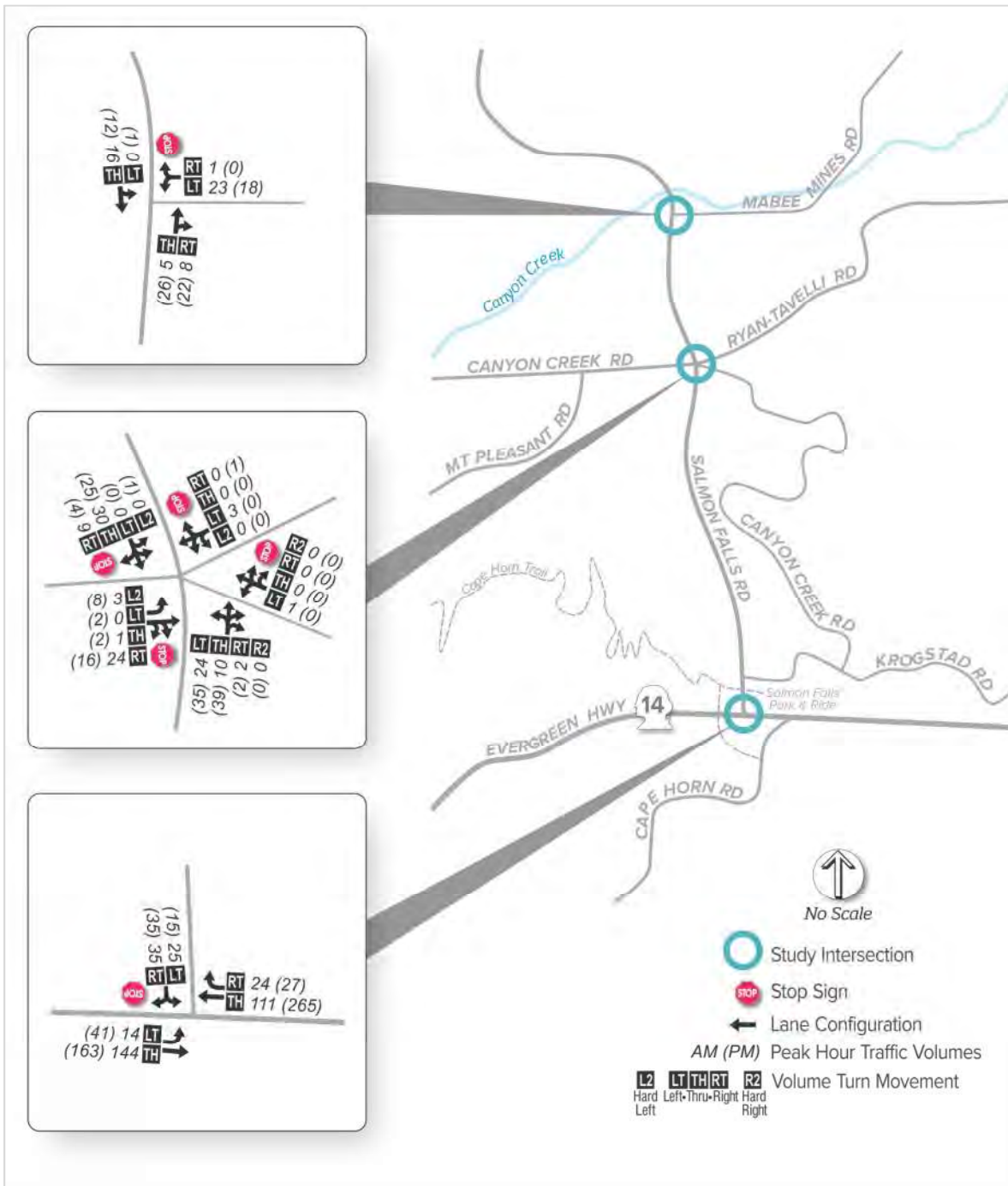


Figure 8: 2022 Baseline Vehicle Volumes

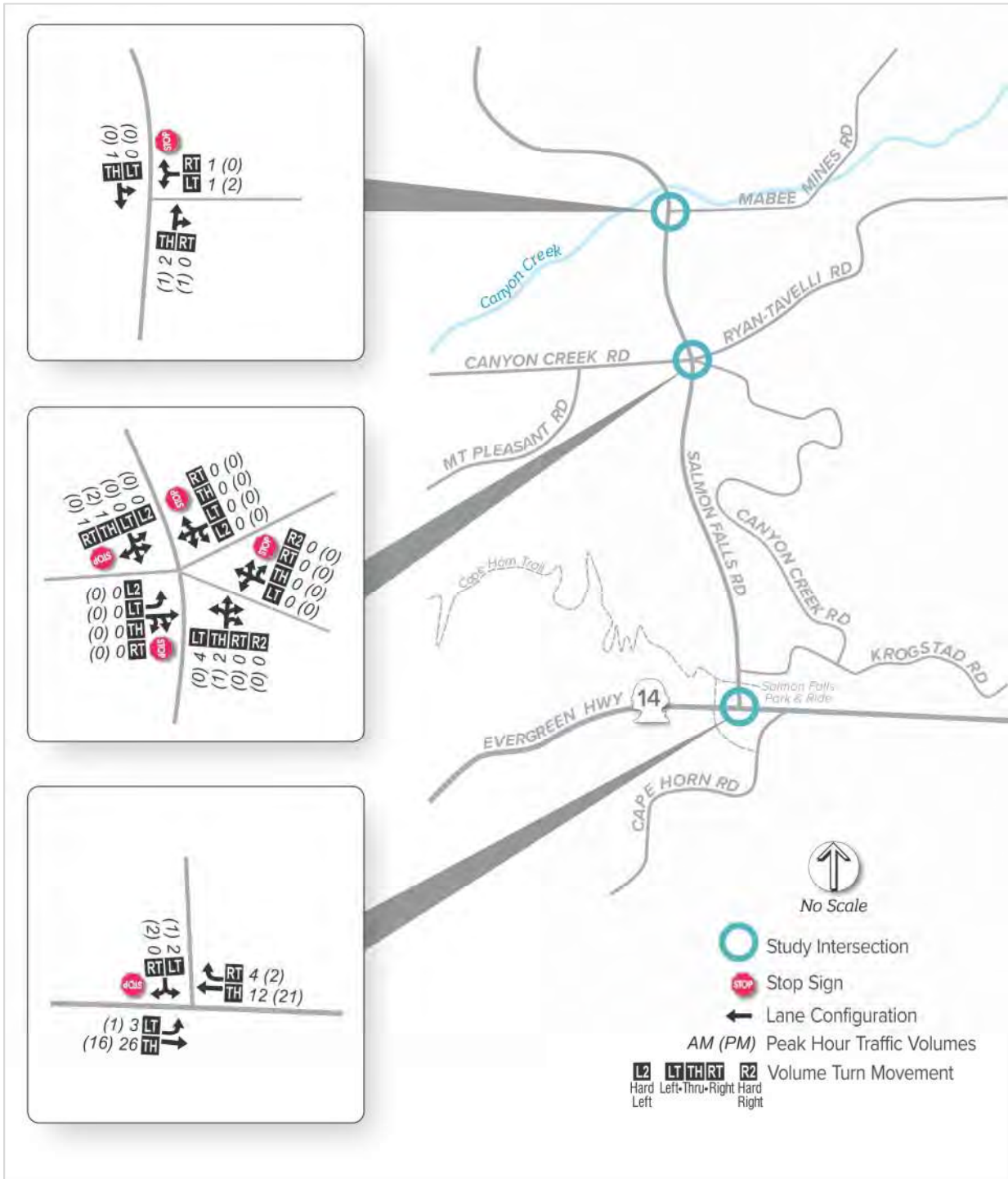


Figure 9: 2022 Baseline Heavy Vehicle Volumes



2022 Baseline Conditions - Operations Analysis

An operational analysis was performed for the study intersections using the future 2022 Baseline Condition volumes developed for the morning and evening peak hours. This analysis includes a rating of the intersection’s performance based on average motor vehicle delay, a level of service (LOS) and a ratio of the volume of vehicles to the capacity of the intersection.

Table 3 shows the future 2022 Baseline Condition intersection performance (delay, LOS, and volume-to-capacity ratio) measures for the morning and evening peak hours. Under the future 2022 Baseline Conditions, intersection performance standards have been met at all the locations. The HCM results are included in the Appendix. Under future Baseline Conditions, intersection performance standards have been met at all the locations.

Table 3: 2022 Baseline Conditions Intersection Operations

Intersection	Morning Peak Hour			Evening Peak Hour			Agency Standard	Intersection Control
	Delay	LOS	V/C	Delay	LOS	V/C		
Evergreen Hwy (SR 14) and Salmon Falls Rd	7.8/10.0	A/B	0.01/0.09	8.0/11.2	A/B	0.04/0.08	C	Unsignalized 1-way stop
Salmon Falls Rd and Mabee Mines Rd	0.0/8.8	A/A	0.00/0.03	7.3/9.0	A/A	0.00/0.02	C	Unsignalized 1-way stop
Salmon Falls Rd, Canyon Creek Rd, and Ryan-Tavelli Rd	7.4/9.5	A/A	0.02/0.05	7.3/9.6	A/A	0.02/0.03	C	Unsignalized 4-way stop (NB Salmon Falls Rd traffic does not stop)

Delay = Average delay per vehicle
 LOS = Level of Service
 Signalized (X) = Average LOS for intersection
 Unsignalized (X/X) = Major Street/Minor Street
 v/c = volume to capacity ratio
 Agency Standard applied to mainline and minor street approaches

2022 Baseline + Project Conditions Analysis

The proposed project would develop a new rock quarry near the end of Mabee Mines Road. Trip generation and distribution patterns were developed for the Proposed Project Conditions based of coordination with the project team. The quarry is expected to operate with up to 250 daily round trips (250 trips into the site and 250 trips leaving the site) during peak season and economic conditions. General hours of operation would be from 7 AM to 4:30 PM. Employees traveling in their personal vehicle would arrive to the site around 6:30 AM to prepare for a 7:00 AM start and leave by 5 PM. A few employees would perform maintenance services until 5:30 PM. Employees traveling in dump trucks would arrive around 7:00 AM and leave around 4:30 PM.

The estimated 500 daily total vehicle trips were separated into the AM and PM peak hours for the study intersection impact analysis. It was assumed 20 percent of the daily trips would occur during the AM peak hour and 20 percent would occur during the PM peak hour. This results in 100 (50 in/50 out) AM peak hour trips and 100 (50 in/50 out) PM peak hour trips. In the AM peak hour, employees arrive to the site in their passenger vehicle, and then exit the site in a gravel trucks to deliver material. In the PM peak hour, the reverse travel pattern occurs.

It was estimated that projects trips would access Highway 14 at Salmon Falls Road, with 80 percent of trips heading to or from the west and 20 percent of trips heading to or from the east. The trip distribution is shown in Figure 10.

The new project trips were added to the Baseline Conditions to create volumes for the 2022 Baseline + Project Conditions (Figure 11). Truck volumes were developed similarly to the motor vehicle volumes. Figure 12 shows the heavy truck volumes for the 2022 Baseline + Project Conditions.

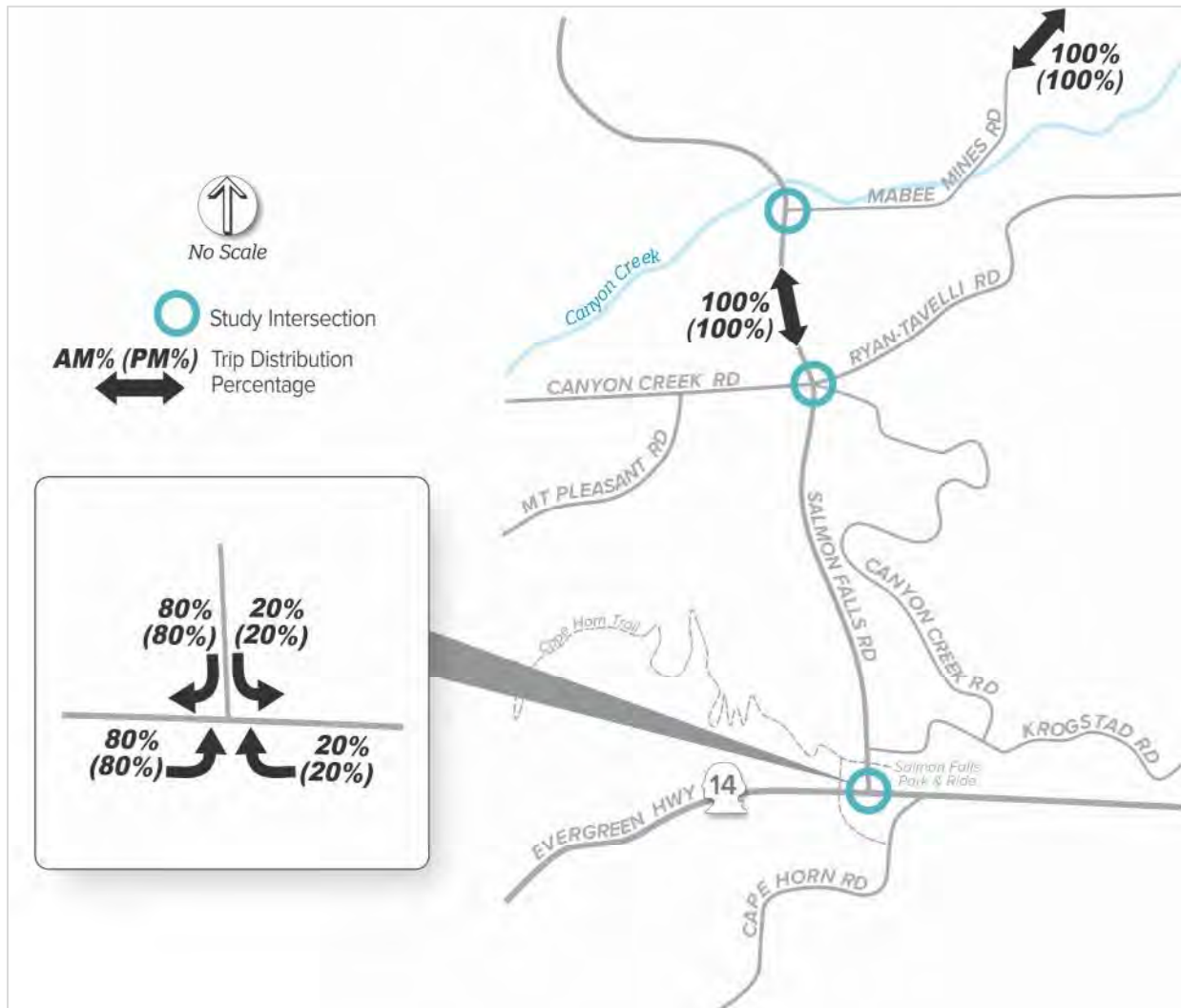


Figure 10: Trip Distribution

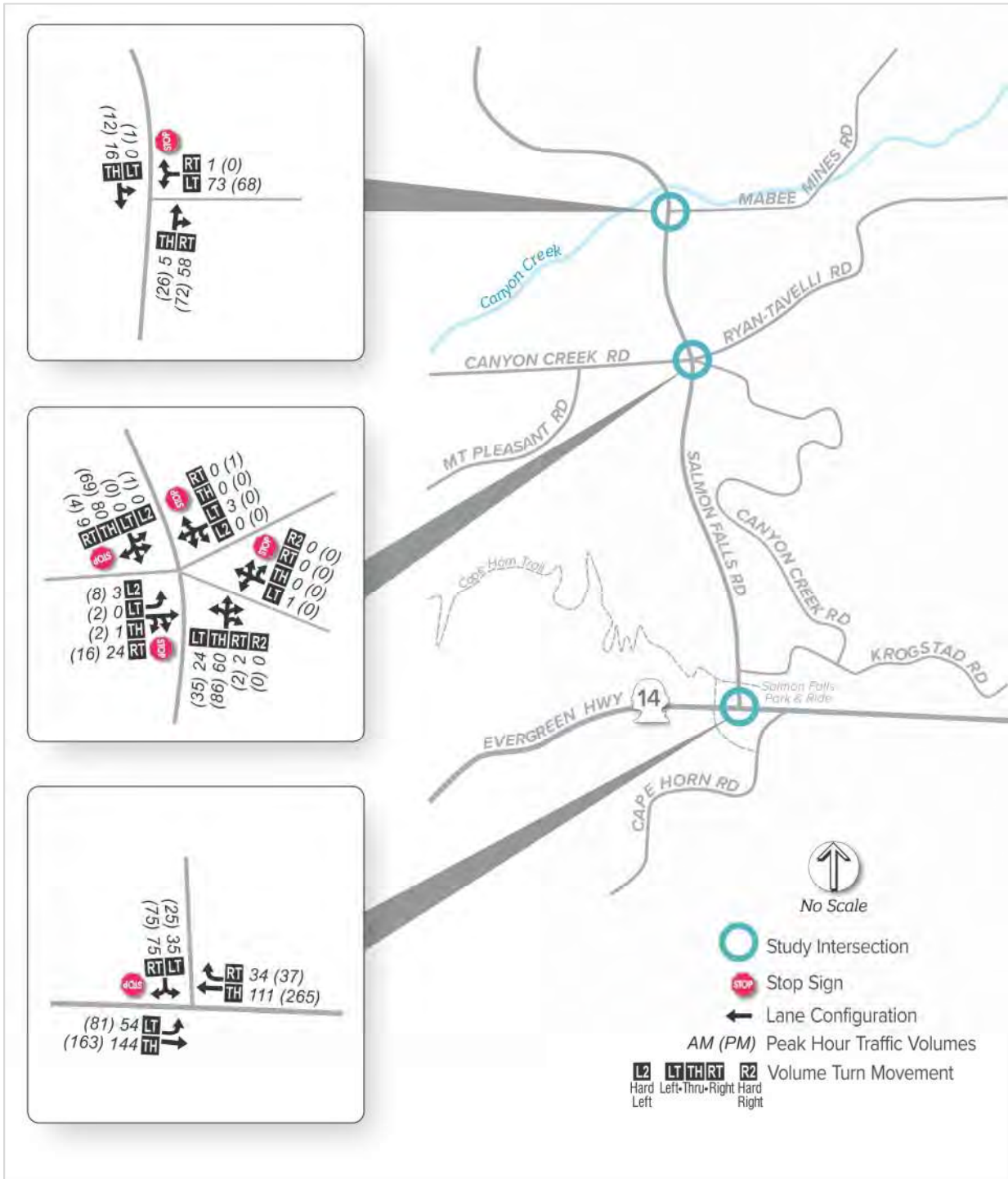


Figure 11: 2022 Baseline + Project Volumes

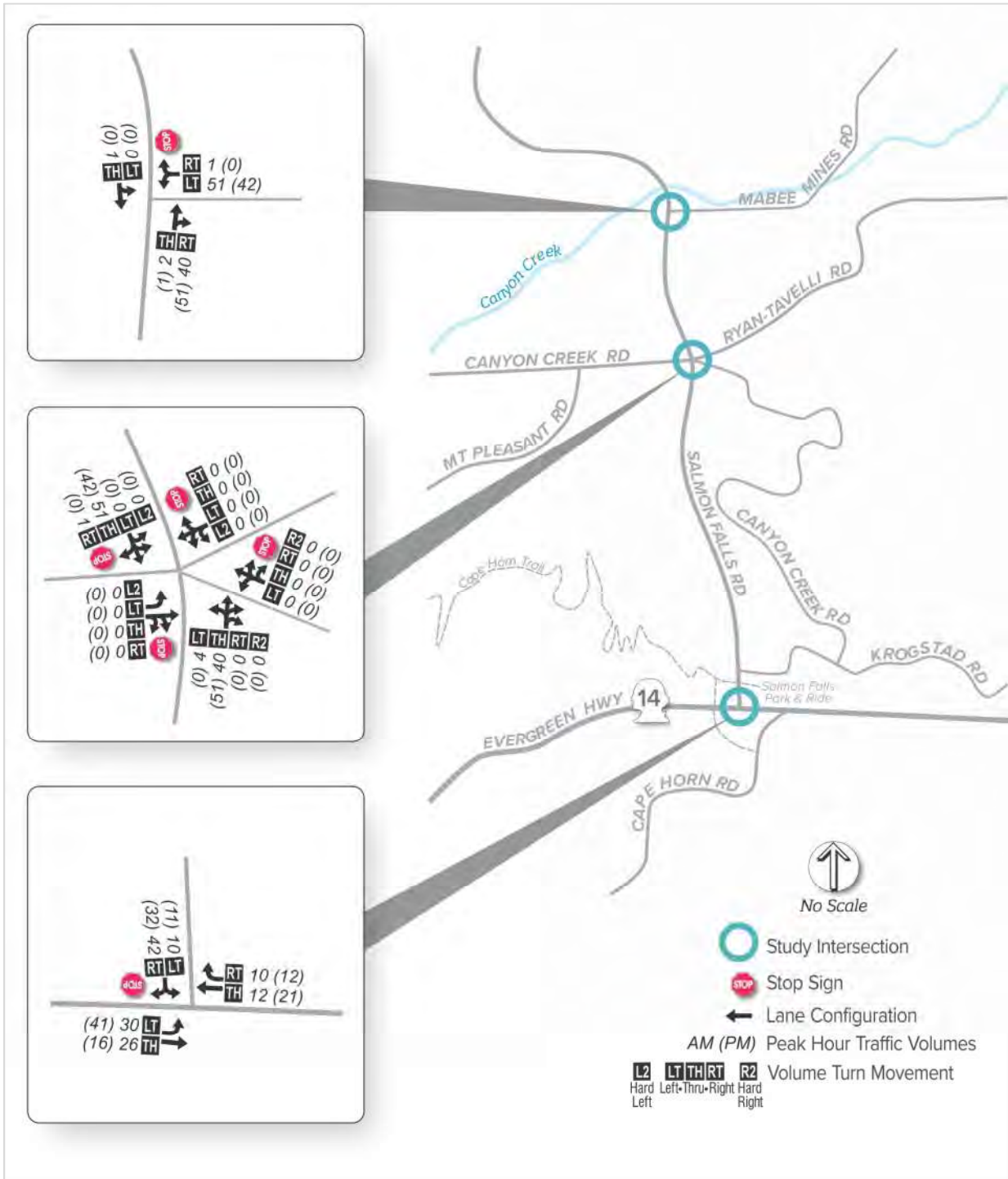


Figure 12: 2022 Baseline + Project Heavy Vehicle Volumes



2022 Baseline + Project Conditions - Operations Analysis

An operational analysis was performed for the study intersections for the 2022 Baseline + Project Conditions for the morning and evening peak hours. Table 4 shows the intersection performance measures (delay, LOS, and volume-to-capacity ratio). Under the future 2022 Baseline + Project Conditions, intersection performance standards have been met at all the locations. The HCM results are included in the Appendix.

Table 4: 2022 Baseline + Project Conditions Intersection Operations

Intersection	Morning Peak Hour			Evening Peak Hour			Agency Standard	Intersection Control
	Delay	LOS	V/C	Delay	LOS	V/C		
Evergreen Hwy (SR 14) and Salmon Falls Rd	8.6/11.3	A/B	0.06/0.18	8.9/13.2	A/B	0.09/0.19	C	Unsignalized 1-way stop
Salmon Falls Rd and Mabee Mines Rd	0.0/10.2	A/B	0.00/0.12	7.4/10.2	A/B	0.00/0.11	C	Unsignalized 1-way stop
Salmon Falls Rd, Canyon Creek Rd, and Ryan-Tavelli Rd	11.1/7.4	A/B	0.02/0.14	7.3/11.3	A/B	0.02/0.13	C	Unsignalized 4-way stop (NB Salmon Falls Rd traffic does not stop)

Delay = Average delay per vehicle
 LOS = Level of Service
 Signalized (X) = Average LOS for intersection
 Unsignalized (X/X) = Major Street/Minor Street
 v/c = volume to capacity ratio
 Agency Standard applied to mainline and minor street approaches

PROJECT SUMMARY

The proposed rock quarry project is anticipated to result in the following impacts:

Trip Generation and Intersection Operations

- The proposed project is estimated to generate 500 daily trips (250 in/250 out) including 100 (50 in/50 out) AM peak hour trips and 100 (50 in/50 out) PM peak hour trips.
- All study intersections meet operating standards with the addition of site generated trips.

Roadway Segment Evaluation

- Salmon Falls Road and Mabee Mines Road will connect the project site to SR 14. Both facilities provide adequate pavement conditions and lane widths to accommodate heavy vehicles. Pavement markings (shoulder and lane striping) are in good condition.
- Roadway signs are provided to identify the limited sight distance segments of Mabee Mines Road.
- Roadway signs are provided to inform drivers “uphill traffic does not stop” at the Salmon Falls Road/Canyon Creek Road/Ryan-Tavelli Road intersection.
- McClosky Creek Road is a narrow roadway, measured to vary between 16 and 20 feet wide. Passenger vehicles require about 18 feet of pavement width to pass each other at low speeds. Large vehicles, such as gravel trucks, require a consistent 22 feet of roadway width to allow adequate space to safely pass each other at low speeds. The roadway should be widened to accommodate the proposed project.

APPENDIX D

**SOUND ANALYSIS FOR SKAMANIA QUARRY; SKAMANIA COUNTY, WASHINGTON
PREPARED BY BRC ACOUSTICS & AUDIOVISUAL DESIGN
DATED SEPTEMBER 9, 2020**

SOUND ANALYSIS

for

**SKAMANIA QUARRY
SKAMANIA COUNTY, WASHINGTON**

Submitted to:

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September 9, 2020

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1. INTRODUCTION

This report describes sound levels associated with proposed mining, aggregate processing, and transportation activities at the proposed Skamania Rock Quarry in Skamania County, Washington. The report presents noise-emission characteristics of the proposed noise sources, calculated sound levels due to mining and processing at the proposed quarry and aggregate transportation off site, and evaluation with respect to noise criteria.

2. PROJECT SITE AND SURROUNDING LAND USES

A vicinity map of the proposed Skamania Quarry, surrounding properties, and sound analysis locations are shown in Figure 2-1.

The site of the proposed Skamania Quarry is located in unincorporated Skamania County, Washington, northwest of the town of Skamania. The project site is on Skamania County Parcel 02060000400000. Properties to the east, north, and west, are unoccupied forest land.

The nearest residential properties are at least ¼ mile to the southwest and southeast of the site perimeter.

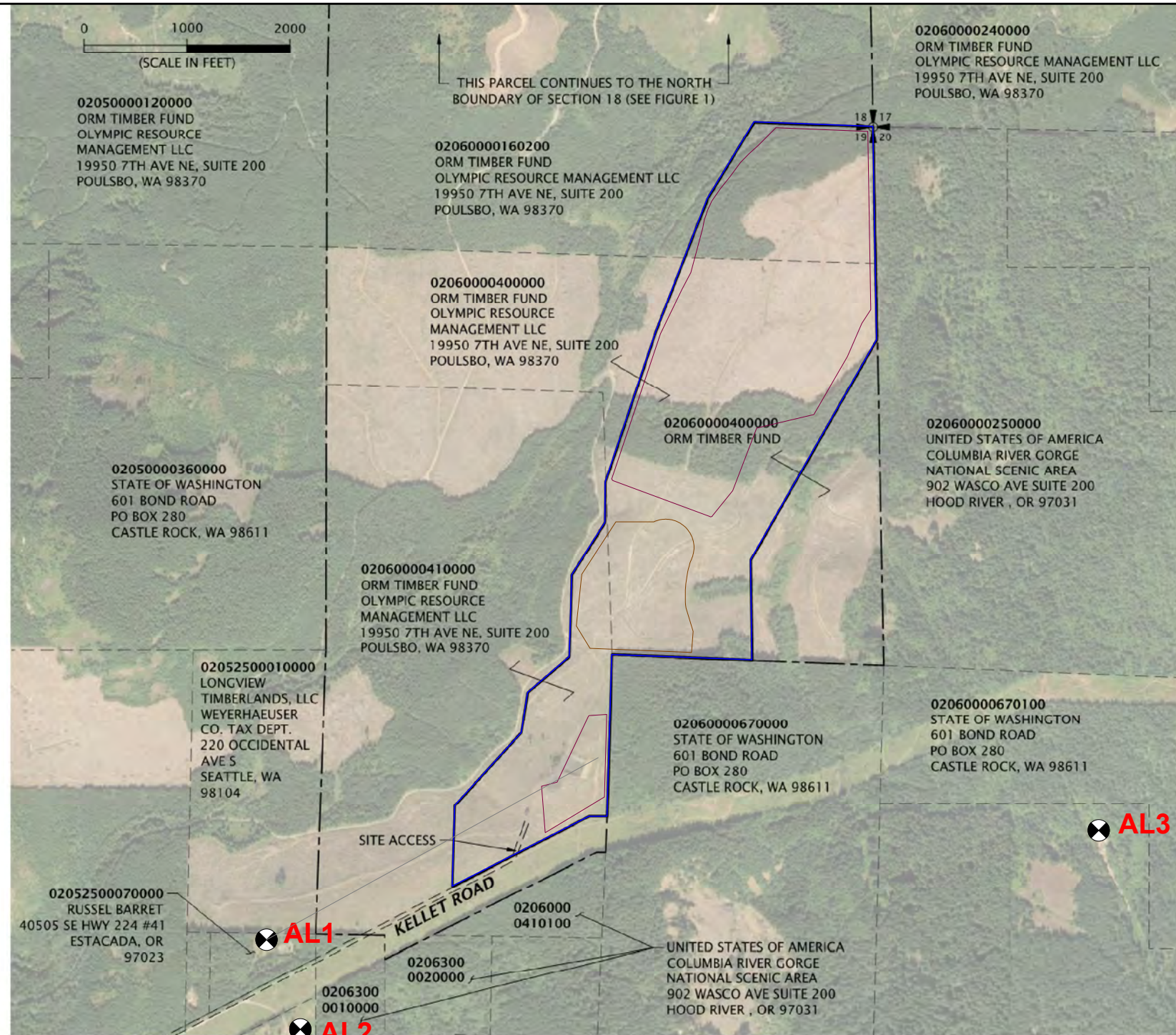
3. SOUND LEVEL DESCRIPTORS AND CRITERIA

3.1 Sound Level Descriptors

Sound is measured as sound level in units of decibels, dB. Environmental sound is often measured as A-weighted sound level in dBA. The A-weighting is a specific weighting filter in a sound level meter that corresponds to human hearing sensitivity at the various sound frequencies. People normally experience sound levels between about 30 and 90 dBA, depending on their activity. For example, a loud nearby vehicle, radio or power tool may produce 80 to 90 dBA, normal conversation is about 50 to 60 dBA, and a bedroom or quiet office is about 30 to 40 dBA.

Each 10-dB increase in sound level corresponds to a tenfold increase of sound energy, but is judged by a listener as only a doubling of loudness. The smallest changes in sound level considered clearly noticeable are about 3 to 5 dB.

Sound levels from two or more sources are combined using logarithms, not by adding the levels. When two levels are combined, the louder level predominates, and the combined level is the louder level plus 0 to 3 dBA. Some examples: 50 dBA combined with 50 dBA is 53 dBA; 50 dBA combined with 40 dBA results in 50.4 dBA, which is rounded off to 50 dBA since fractions of a dB are negligible from the point of view of human hearing.



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Figure 2-1

	Date	Name
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Skamania Quarry Sound Analysis

Project Site and Sound-Analysis Locations

BRC Acoustics & Audiovisual Design

Because sound levels fluctuate over time, several A-weighted sound level descriptors are used to characterize the sound over time. In this Analysis, the following descriptors are used:

- Leq** **Equivalent sound level, Leq**, is the most commonly used descriptor for measuring fluctuating sound. The Leq is the level of a constant sound that, over a given time period, contains the same amount of sound energy as the measured fluctuating sound.
- Lmax** **Maximum sound level, Lmax**, is the highest instantaneous sound level for a given sound source, event, or time period. Because the Lmax in a neighborhood will, unlike Leq, typically have large fluctuations from hour to hour and day to day, Lmax is seldom used to measure noise impact, except in cases where brief high-level sound is causing an impact such as sleep disturbance.

3.2 Skamania County Noise Regulations

Relevant Skamania County regulations are contained in Section 8.22 – *Noise Regulations* of the Skamania County Code (SCC). Permissible sound levels are based on the Environmental Designation for Noise Abatement (EDNA) of source and receiving properties.

The Skamania Quarry is considered Class C EDNA (“*lands involving economic activities of such a nature that higher noise levels ... are normally to be anticipated*”). Surrounding properties occupied by residences are considered Class A EDNA (“*Lands where human beings reside and sleep*”).

The primary limits for noise produced at Class C EDNA properties and received at EDNA Class A properties are modeled after State of Washington noise limits (WAC 173-60) and are contained in Table 3-1.

TABLE 3-1 STATE OF WASHINGTON PERMITTED SOUND LEVELS FOR EDNA CLASS C NOISE SOURCES AND CLASS A RECEIVERS	
Time of Day	Limit on Continuous Sound Sources (dBA)
Daytime (7 a.m. to 10 p.m.)	60
Nighttime (10 p.m. to 7 a.m.)	50

In any one-hour period, the basic noise limits may be exceeded by 5 dBA for a total of 15 minutes or by 10 dBA for a total of 5 minutes or by 15 dBA for a total of 1.5 minutes. This represents a limit on the hourly Lmax (not to be exceed for more than 1.5 minutes per hour) of 75 dBA during the day and 65 dBA at night. This allowed exceedance applies, for example, to single pass-bys from trucks.

Skamania County Code 8.22.110.E exempts sounds created by blasting and/or mining operations from the noise limits if the operations occur during the daytime. The exemption for mining operations does not appear in WAC 173-60. Therefore, the noise limits listed in Table 3-1 are applied in this analysis.

The noise limits in Table 3-1 apply to mining and processing equipment at the site and to trucks operating within the project property. Noise from traffic on public roads is exempt from the noise limits of Table 3-1, according to SCC 8.22.130.G and WAC 476-60-050(4)(a). Relevant guidelines for project-related traffic noise on public roads are presented in the following section.

3.3 Federal Highway Administration (FHWA) and Washington State Department of Transportation (WSDOT) Criteria

Noise from project-related traffic on off-site public roads is exempt from Skamania County noise limits presented in Table 3-1. However, potential noise impacts from off-site aggregate trucks may be evaluated using criteria based on Title 23 of the Code of Federal Regulations Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, (23 CFR 772) and its interpretation by WSDOT.

The FHWA regulations define noise impacts as those levels that approach or exceed the Noise Abatement Criteria. The FHWA Noise Abatement Criterion is an exterior peak-hour Leq of 67 dBA for residential land use and 72 dBA for commercial land use. The peak-hour is defined as the highest hourly sound level in a typical 24-hour period.

The FHWA document also defines impacts as substantial increases over existing sound levels. The FHWA directs individual State Departments of Transportation (DOTs) to define the meaning of “approaching” the abatement criteria and to establish the amount of sound increase that represents a substantial increase.

The application of the FHWA document by the Washington State Department of Transportation *Traffic Noise Policy and Procedures* (2020). According to the WSDOT policy, a sound level is considered to approach the 67-dBA criterion if it is within 1 dBA of the criterion. The WSDOT policy defines a substantial increase as an increase of 10 dBA or more over existing sound levels.

FHWA and WSDOT criteria for residential receivers are applied to receiver locations at the same setback from the road as the residences.

Based on FHWA and WSDOT policies, project traffic sound will be considered an impact when either of the following occurs:

1. Predicted sound levels are 66 dBA or greater.
2. Predicted sound increases are equal to or greater than 10 dBA.

It should be noted that WSDOT requires a noise study for projects that require FHWA approval. These are Type 1 (qualifying highway projects, which entail changes to a roadway) and Type 2 (retrofit for the purpose of noise abatement) projects. Since the Skamania Quarry does not represent a roadway construction or improvement project and therefore does not require a traffic noise analysis, this study of traffic-noise impacts does not follow all the steps mandated for projects requiring FHWA approval. Specifically, the process of validating the noise model, which requires measuring sound levels while counting vehicle movements, has been omitted. In this analysis, the FHWA and WSDOT criteria are considered as recommendations.

4. PROPOSED OPERATIONS AND SOUND EMISSIONS

4.1 Proposed Operations

The description of proposed operations is based on the project Reclamation plans and cross-sections prepared by GeoDesign, Inc., dated February 2019. Proposed operations at the Skamania Quarry include material extraction, on-site transportation by truck and conveyor, crushing, screening, and load-out. Mineral extraction would be effected by drilling, blasting, and truck-loading. Loaders are used for truck load-out. Crushing and screening are conducted in the center-west portion of the site (west half of the area designated R-3 in Figure 4 of the project Reclamation Plan).

Along with the above listed activities, additional noise-generating activities ancillary to the operation of an active surface mine include stockpiling and equipment maintenance.

Rock and aggregate would be transported off site using a private access road from Kellet Road, entering the site from the south. According to the project Transportation Impact Study, site trip generation during the a.m. or p.m. peak hour could reach 100 one-way truck trips (50 round trips) per hour.

Proposed hours of operation are 7 a.m. to 4:30 p.m.

Minimum 30-foot wide native vegetative buffers would remain undisturbed along the entire perimeter of the project site.

4.2 Equipment Sound Emissions

Reference sound levels for proposed equipment were obtained from the BRC Acoustics database. Source sound levels normalized to a reference distance of 50 feet are shown in Table 4-1.

TABLE 4-1 REFERENCE SOUND LEVELS OF PROPOSED EQUIPMENT	
Source	Sound Level at 50 Feet Leq, dBA
Loader	78
Dump truck	78
Screen	83
Crusher	84
Crusher	82
Rock drill	84

5. CALCULATED SOUND LEVELS AND EVALUATION

5.1 Methodology for Sound Modeling

Sound-level calculations of proposed on-site activities were performed using the CadnaA program, which is based on International Standard ISO 9613 for the prediction of environmental noise. The model takes into account the sound power level, directivity, location, and height of the noise source, distance, ground cover and topography between the noise source and receiver, atmospheric conditions, and location and height of the receiver.

Table 5-1 lists the modeled scenarios and assumptions regarding location of equipment during proposed future activities.

**TABLE 5-1
 NOISE MODELING SCENARIOS FOR PROPOSED OPERATIONS**

Variant	Topographical Conditions	Scenario Description	Sound Source Locations
01	Segment M-1/R-1 at existing elevations;	Start of mining in Segment M-1 at existing elevations	Loader, truck, and rock drill at center of Segment M-1, elevation ~2300'
	Segment R-3 at existing elevations;	Start of processing and load-out operations in Segment R-3, existing elevations	<ul style="list-style-type: none"> Two crushers, screening plant, loader near center of Segment R-3, elevation ~2180' 100 one-way truck trips on the access road
	Segment M-2/R-2 at existing elevations	No activities in Segment M-2/R-2	None
02	Segment M-1/R-1 at final elevations (2060'-2120');	Conclusion of mining in Segment M-1/R-1 at final elevations	Loader, truck, and rock drill at south end of Segment M-1/R-1, elevation ~2060';
	Segment R-3 at existing elevations	Continuation of processing and load-out operations in Segment R-3, existing elevations	<ul style="list-style-type: none"> Two crushers, screening plant, loader near center of Segment R-3, elevation ~2180' 100 one-way truck trips on the access road
	Segment M-2/R-2 at existing elevations	No activities in Segment M-2/R-2	None
03	Segment M-1/R-1 at final elevations (2060'-2120');	No activities in Segment M-1/R-1	None
	Segment R-3 at final elevations (2060'-2160')	Continuation of processing and load-out operations in Segment R-3 at final elevations	<ul style="list-style-type: none"> Two crushers, screening plant, loader in Segment R-3, elevation ~2160' 100 one-way truck trips on the access road
	Segment M-2/R-2 at existing elevations	Start of mining in Segment M-2/R-2 at existing elevations	Loader, truck, and rock drill near center of Segment M-2/R-2, elevation ~2260'
04	Segment M-1/R-1 at final elevations (2060'-2120');	No activities in Segment M-1/R-1	None
	Segment R-3 at final elevations (2060'-2160')	Continuation of processing and load-out operations in Segment R-3 at final elevations	<ul style="list-style-type: none"> Two crushers, screening plant, loader in Segment R-3, elevation ~2160' 100 one-way truck trips on the access road
	Segment M-2/R-2 at final elevations (2220')	Conclusion of mining in Segment M-2/R-2 at final elevations	Loader, truck, and rock drill near center of Segment M-2/R-2, elevation ~2220'

5.2 Sound Analysis Locations

For the purpose of analyzing sound levels from proposed operations, three sound-analysis locations were selected to represent occupied properties and structures that may be affected by project sounds. The analysis locations are listed in Table 5-2 and shown in Figure 2-1.

Analysis Location	Description
AL1	Second-story window of residence on Parcel 020-525-0007-0000
AL2	First-story window of residence on Parcel 020-525-0008-0000
AL3	Second-story window of residence on Parcel 020-629-0004-0000

5.3 Calculated Sound Levels

Calculated Leq sound levels from proposed mining, processing, and on-site transportation operations are shown in Table 5-3. The table also shows applicable State of Washington noise limits.

5.4 Evaluation

As shown in Table 5-3, calculated Leq sound levels from proposed mining and processing activities at the Skamania Quarry meet State of Washington daytime and nighttime noise limits at all analysis locations.

**TABLE 5-3
 CALCULATED SOUND LEVELS (dBA)
 FROM PROPOSED OPERATIONS
 WITHOUT ADDITIONAL NOISE MITIGATION**

BRC Ref.	Scenario Description	Sound Levels at Analysis Locations		
		1	2	3
01	Leq during start of mining Segment M-1/R-1 and of processing in Segment R-3	39	37	37
	Leq from start of processing in Segment R-3	33	31	33
	Leq from continuing material hauling on access route, 100 one-way trips per hour	37	35	31
	Leq from start of mining Segment M-1/R-1	10	10	33
02	Leq during conclusion of mining Segment M-1/R-1 and continuation of processing	39	36	37
	Leq from continuing processing in Segment R-3	33	31	33
	Leq from continuing material hauling on access route, 100 one-way trips per hour	37	35	31
	Leq from conclusion of mining Segment M-1/R-1	28	10	34
03	Leq during continuation of processing and start of mining Segment M-2/R-2	42	39	37
	Leq from continuing processing in Segment R-3	34	32	31
	Leq from continuing material hauling on access route, 100 one-way trips per hour	37	35	25
	Leq from start of mining Segment M-2/R-2	39	35	35
04	Leq during continuation of processing and conclusion of Segment M-2/R-2	42	39	32
	Leq from continuing processing in Segment R-3	34	32	31
	Leq from continuing material hauling on access route, 100 one-way trips per hour	36	34	25
	Leq from conclusion of mining Segment M-2/R-2	39	35	24
State of Washington daytime noise limits for Leq		60	60	60
State of Washington nighttime noise limits for Leq		50	50	50

6. NOISE MITIGATION MEASURES

The proposed Skamania Quarry incorporates minimum 30-foot wide native vegetative buffers along the entire perimeter of the project site. This noise mitigation measure was taken into account in the results presented in Section 5.3.

As presented in Section 5.4, calculated sound levels from proposed mining, processing, and on-site transportation activities at the Skamania Quarry are expected to meet applicable State of Washington noise limits at surrounding properties. As a result of these findings, no additional noise mitigation measures are required for on-site activities.

7. PROJECT-RELATED TRAFFIC NOISE

Information regarding traffic generated by the project was obtained from the Transportation Impact Study prepared by DKS on February 19, 2020. Aggregate trucks traveling from Mabee Mines Road would access and exit the site from the west on Kellet Road and enter at the south of the quarry. Project traffic would travel on Salmon Falls Rd between Mabee Mines Rd and Evergreen Highway (SR-14).

The quarry is expected to generate up to 250 daily round trips (250 trips into the site and 250 trips leaving the site) during peak season and economic conditions. General hours of operation would be from 7 a.m. to 4:30 p.m. Employees traveling in their personal vehicles would arrive to the site around 6:30 a.m. to prepare for a 7:00 a.m. start and leave by 5 p.m. A few employees would perform maintenance services until 5:30 p.m. Employees traveling in dump trucks would arrive around 7:00 a.m. and leave around 4:30 p.m.

The Transportation Impact Study assumed that 20 percent of the 500 daily vehicle trips would occur during the a.m. peak hour and 20 percent would occur during the p.m. peak hour. This results in 100 (50 in/50 out) a.m. peak-hour trips and 100 (50 in/50 out) p.m. peak-hour trips. The a.m. and p.m. peak hours are considered 7 to 8 a.m. and 5 to 6 p.m., respectively. The a.m. peak trips would be all 50 trucks, while the p.m.-peak volume would consist of 40 truck and 10 passenger vehicle trips.

Sound produced by the trucks while on the quarry site is subject to the same criteria as the rest of the equipment operating at the quarry, and was included in the sound level calculations listed in Section 5 of this report. Sound from aggregate trucks on public roads is not subject to the State of Washington sound limits shown in Table 3-1. However, sound impacts from off-site project-related truck traffic may be evaluated with respect to the FHWA and WSDOT criteria discussed in Section 3.3.

To evaluate potential noise impacts from off-site truck traffic, three sound-analysis locations were added to the locations listed in Table 5.2. These residences, listed in Table 7-1 as Analysis

Locations T1 to T3, are not in the vicinity of the quarry but could be exposed to noise from off-site project traffic. Analysis Locations T1 to T3 were selected to represent residential property along the project truck route along Mabee Mines Road and Salmon Falls Road. The analysis locations were approximately 100 feet from the road centerlines, which is shown to be a typical residential setback on Skamania County GIS maps of the area.

Analysis Location	Description
T1	Residence at 592 Mabee Mines Road, between Salmon Falls Road and Quarry, Parcel 010-503-0001-0300
T2	Residence at 632 Salmon Falls Road, between Mabee Mines Road and Canyon Creek Rd., Parcel 010-503-3003-0000
T3	Residence at 481 Salmon Falls Road, between Canyon Creek Road and SR-14, Parcel 010-503-3011-0000

Calculations of traffic sound levels were conducted using the FHWA model for calculating traffic noise, TNM version 2.5. The calculations were conducted for the p.m. peak traffic hour of 5 to 6 p.m. The p.m. peak hour was selected because the percent increase in truck volumes over existing conditions on the roads was found to be slightly higher for the p.m. peak than the a.m. peak hour. Traffic was assumed to travel at the speed limit of 35 mph.

Results of the Traffic Sound Analysis are presented in Table 7-2.

Scenario Description	Sound Levels at Analysis Locations		
	T1	T2	T3
Year 2019 existing volume total/trucks	47	49	51
Year 2022 without project total/trucks	47	49	51
Year 2022 with project total/trucks	60	61	61
FHWA Noise Abatement Criterion	67	67	67

*Note: Sound levels shown in **Boldface** exceed the FHWA substantial-increase criterion of 10 dBA*

As shown in Table 7-2, the calculated p.m.-peak traffic sound levels with the project exceed the calculated sound levels for Year-2019 existing conditions or Year-2022 conditions without the project by up to 13 dBA at Location T1 and by up to 12 dBA at Location T2. Increases of 10

dBA or more are considered substantial by WSDOT criteria and are considered noise impacts according to FHWA criteria outlined in Section 3.3 of this report.

During the Year 2022 with the project, the calculated sound levels do not approach or exceed the FHWA Abatement Criterion of 67 dBA at the Sound Analysis Locations.

In a project requiring FHWA approval, the finding of a substantial noise increase would be followed by an evaluation of feasibility or reasonableness of constructing noise barriers on the affected road segments. The evaluation would consider factors such as the number of residences affected by the project or benefiting from noise-abatement barriers, amount of noise reduction achievable, and cost.

It should be reiterated that the FHWA Noise Abatement Criterion and the sound-increase criteria are used only as guidelines in this analysis. They are intended for road-building or road-improvement projects and are not a requirement for other, non-roadway projects.

8. SUMMARY AND CONCLUSIONS

The findings of the Sound Analysis are summarized as follows:

- Calculated Leq sound levels from proposed mining and processing activities at the Skamania Quarry meet State of Washington daytime and nighttime noise limits at all sound analysis locations.
- Calculated p.m.-peak traffic sound levels with the project exceed the calculated sound levels for Year-2019 existing conditions or Year-2022 conditions without the project by up to 13 dBA at Location T1 and by up to 12 dBA at Location T2. Increases of 10 dBA or more are considered substantial by WSDOT criteria and are considered noise impacts according to FHWA criteria. The FHWA Noise Abatement Criterion and the sound-increase criteria are used only as guidelines in this analysis. They are intended for road-building or road-improvement projects and are not a requirement for other, non-roadway projects.
- During the Year 2022 with the project, the calculated sound levels do not approach or exceed the FHWA Abatement Criterion of 67 dBA at the Sound Analysis Locations.

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