

APPENDIX A

DNR FORM SM-8A – APPLICATION FOR RECLAMATION PERMIT

RECEIVED
June 11, 2024
Washington Geological Survey



**APPLICATION FOR
RECLAMATION PERMIT AND PLAN
(Form SM-8A)**

Check appropriate box(es): new permit revision of existing permit transfer of permit expansion

NOTE: Do not attempt to complete this form until you have carefully read "Instructions for Form SM-8A".

1. NAME OF APPLICANT/PERMIT HOLDER(S) Vaagen Brothers Lumber, Inc.			
2. MAILING ADDRESS 565 West 5th Avenue, Colville WA 99114			
3. Telephone 509-680-1773		Email Jeffwaterman1dub@outlook.com	
4. NAME OF MINE Major Road Mine			
5. Street address and milepost of surface mine 2940 Leslie Creek Road Chewelah, WA 99109			
6. Distance (miles) 8	7. Direction from North	8. Nearest community Chewelah	
9. COUNTY Stevens No attachments will be accepted. Legal Description of permit area:			
1/4	Section	Township	Range
NW	12	33 N	40 E
10. Do you or any person, partnership, or corporation associated with you now hold, or have you held, a surface mining operating or reclamation permit? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no If you answered yes to the above, please list: #70-013126 Naff Pit			
11. Are all of these mines now in compliance with RCW 78.44, WAC 332-18, and conditions of the permits? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no pending expansion application review Have you ever had a surface mine operating or reclamation permit revoked? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Have you ever had a reclamation security forfeited? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no If you answered yes to either of the above, give permit number(s):			

12. TOTAL ACREAGE OF PERMIT AREA APPLIED FOR: (Include all acreage to be permitted. See Form SM-6.) 42.8 acres	
13. Total disturbed acreage (Include all acreage to be disturbed by mining and reclamation during the life of the mine.) Total area to be disturbed: ~13 acres. Area to be disturbed in next 36 months: ~4 acres.	
14. Maximum vertical depth (thickness) mined below pre-mining topographic grade will be 100 feet.	
15. Lowest elevation of excavated mine will be 2,320 feet relative to mean sea level. Highest elevation of excavated mine will be 2,500 feet relative to mean sea level.	
16. Type of proposed or existing mine: <input checked="" type="checkbox"/> pit <input type="checkbox"/> quarry	
17. Material(s) to be mined: <input checked="" type="checkbox"/> sand and gravel <input checked="" type="checkbox"/> rock or stone <input type="checkbox"/> clay <input type="checkbox"/> metal <input type="checkbox"/> limestone <input type="checkbox"/> silica <input type="checkbox"/> other _____	
18. Deposit type: <input checked="" type="checkbox"/> glacial <input type="checkbox"/> river floodplain (alluvial) <input type="checkbox"/> river channel deposits <input type="checkbox"/> talus <input type="checkbox"/> bedrock <input type="checkbox"/> lode <input checked="" type="checkbox"/> other _weathered rock_	
19. Expected start date of mining: Fall 2024	20. Estimated number of years: ~15
21. Total quantity to be mined over life of mine (estimated): 433,000 <input type="checkbox"/> tons or <input checked="" type="checkbox"/> cu yds	22. Estimated annual production: 30,000 <input type="checkbox"/> tons or <input checked="" type="checkbox"/> cu yds
23. Subsequent land use: <input type="checkbox"/> industrial <input type="checkbox"/> commercial <input type="checkbox"/> residential <input type="checkbox"/> agricultural <input checked="" type="checkbox"/> forestry <input type="checkbox"/> wetlands and lakes <input type="checkbox"/> other County or Municipality Approval for Surface Mining (Form SM-6) attached? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	
24. Reclaimed elevation of floor of mine: 2,320 feet relative to mean sea level Reclaimed elevation is shown on cross sections? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	
25. SEPA Checklist required? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	
26. Application fee for a new reclamation permit is herewith attached? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	

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22. SEGMENTAL RECLAMATION	
Permit area has been divided into segments for mining and a mining schedule has been developed? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Permit area has been divided into segments for reclamation and a reclamation schedule has been developed? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
23. SITE PREPARATION	
23A. Saving Topsoil, Subsoil, and Overburden for Reclamation	
Thickness of topsoil is <u>~1</u> feet Thickness of subsoil is <u>~1 to 2</u> feet Depth to bedrock is <u>unknown</u> feet Total volume of topsoil is <u>~10,000</u> cubic yards Total volume of subsoil is <u>~20,000</u> cubic yards Volume of stored topsoil/subsoil is <u>~30,000</u> cubic yards and will require <u>~3</u> acres for storage.	
Storage areas are shown on maps and will be marked on the ground with permanent boundary markers? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Topsoil will be salvaged? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Topsoil and overburden will be moved to reclaim an adjacent depleted segment? If no, explain: Topsoil and overburden will be placed in perimeter berms to stage for later use in reclamation upon completion of mining. Concurrent reclamation will occur to the extent possible.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Before materials are moved, vegetation will be cleared and drainage planned for soil storage areas? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Soil storage areas will be stabilized with vegetation to prevent erosion if materials will be stored for more than one season? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
23B. Permit and Disturbed Area Boundaries	
Boundary of the permit area will be marked on the ground with permanent boundary markers? Explain boundary markers: T-posts	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
23C. Setbacks Screens and Buffers	
Are Screens required and are shown on maps?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
The reclamation setback for this site will be <u>minimum 50</u> feet wide. Increased, voluntary setbacks ranging from 280 to 500 feet will be observed from the limits of extraction to the east and west permit boundary, which are defined by existing, unimproved roadways.	
Is a permanent, undisturbed buffer planned for this site? If no, explain: No buffers required. Setbacks will be used for topsoil storage and access roads.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Setbacks and buffers are shown on maps and have been marked on the ground with permanent boundary markers? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
23D. Buffers to Protect Streams and Flood Plains	
Will the site include a stream or flood plain? If yes, see "Additional Requirements for Mines in Flood Plains" in "Instructions for SM-8A". If no, skip to 23E.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
A stream buffer of at least 200 feet has been marked on the ground with permanent boundary markers?	<input type="checkbox"/> yes <input type="checkbox"/> no
A buffer of at least 200 feet from the 100-year flood plain has been marked on the ground with permanent boundary markers? If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Copy of Shoreline Permit from local government or the Department of Ecology is attached?	<input type="checkbox"/> yes <input type="checkbox"/> no
Hydraulic Project Approval from the Department of Fish and Wildlife is attached?	<input type="checkbox"/> yes <input type="checkbox"/> no

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23E. Conservation Buffers	
Are there any conservation buffers?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If no, skip to 23F	
Conservation buffers will be established for the following purpose(s): <i>(Check all that apply)</i> <input type="checkbox"/> unstable slopes <input type="checkbox"/> wildlife habitat <input type="checkbox"/> water quality <input type="checkbox"/> other Describe the nature and configuration of the conservation buffer(s):	
Conservation buffers are shown on maps and have been marked on the ground with permanent boundary markers?	<input type="checkbox"/> yes <input type="checkbox"/> no
23F. Ground Water	
High water table depth is _____ feet <input type="checkbox"/> relative to mean sea level, <input type="checkbox"/> below original surface, or <input checked="" type="checkbox"/> unknown. Low water table depth is _____ feet <input type="checkbox"/> relative to mean sea level, <input type="checkbox"/> below original surface, or <input checked="" type="checkbox"/> unknown. Annual fluctuation of water table is from _____ feet on _____ to _____ feet on _____. Unknown; refer to Hydrogeology section in Narrative.	
Are well logs attached? Four attached	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
The shallowest aquifer is <input type="checkbox"/> confined <input checked="" type="checkbox"/> unconfined	
The site will be mined: <input type="checkbox"/> wet <input checked="" type="checkbox"/> dry <input type="checkbox"/> both Describe mining method: side-hill cut	
The site is in a: <input type="checkbox"/> critical aquifer recharge area <input type="checkbox"/> sole source aquifer <input type="checkbox"/> public water supply watershed <input type="checkbox"/> wellhead protection area <input type="checkbox"/> special protection area <input type="checkbox"/> designated aquifer protection area <i>If checked above, see "Additional Requirements for Mines in Hydrologically Sensitive Areas" in "Instructions for SM-8A".</i>	
Ground water study attached?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If no, explain: Groundwater occurs at deeper depth than proposed mining based on well log review.	
23G. Archeology	
Are archeological/cultural resource sites present?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If yes, describe how you will protect these resources:	
24. MINING PRACTICES TO FACILITATE RECLAMATION	
24A. Soil Replacement	
Topsoil and (or) subsoil will be restored?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If "no", explain:	
Subsoil will be replaced to an approximate depth of <u>1</u> feet on the pit floor and a depth of <u>1</u> feet on slopes. Topsoil will be replaced to an approximate depth of <u>1</u> feet on the pit floor and a depth of <u>1</u> feet on slopes.	
If topsoil is in short supply, it will be strategically placed in depressions and low areas in adequate thickness to conserve moisture and promote revegetation?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If no, explain:	
Topsoil will be moved when conditions are not overly wet or dry?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If no, explain:	
Topsoil will be restored to promote effective revegetation and to stabilize slopes and mine floor?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If "no", explain:	
Topsoil will be replaced with equipment that will minimize compaction, or it will be plowed, disked, or ripped following placement?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If no, explain:	
Topsoil will be immediately stabilized with grasses and legumes to prevent loss by erosion, slumping, or crusting?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If no, explain:	

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Segmental topsoil removal and replacement is shown on maps? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Topsoil will be imported? If yes, describe source. Estimated volume is _____ cubic yards.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Synthetic topsoil made from compost, biosolids, or other amendments will be used and (or) made on site to supplement existing topsoil?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Materials such as till, loess, and (or) silt are available on site that could be used to supplement topsoil for reclamation. If yes, explain: If loess or other fines are encountered, they can be stored and used for supplemental rooting medium for reclamation.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Silt from settling ponds or a filter press will be used for reclamation?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Settling pond clay slurries will be pumped or hauled to other segments for reclamation? If yes, explain:	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
24B. Removal of Vegetation	
Vegetation will be removed sequentially from areas to be mined to prevent unnecessary erosion? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Small trees and other transplantable vegetation will be salvaged for use in revegetating other segments? If yes, give details. If no, explain: Mine extraction will progressively traverse the site in 2 small segments without a place to transplant trees until near the end of mining.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Wood and other organic debris will be: <input type="checkbox"/> recycled <input checked="" type="checkbox"/> removed from site <input checked="" type="checkbox"/> chipped <input checked="" type="checkbox"/> burned <input type="checkbox"/> buried <input type="checkbox"/> used to synthesize topsoil or mulch <input type="checkbox"/> other (<i>explain</i>)	
Solid waste disposal, burning, and land use permits are attached?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Some coarse wood (logs, stumps) and other large debris will be salvaged for fish and wildlife habitats? If yes, give details. If no, explain: Coarse wood can be moved to other portions of the relevant parcel to enhance existing wildlife habitat and could be moved back onto the reclaimed site.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
24C. Stormwater and Erosion control for Reclamation	
Pit floor will slope at gentle angles toward highwall, sediment retention pond, or proper drainage? If yes, give details. If no, explain: Final slopes will direct drainage to the mine floor and designated areas for infiltration.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Revegetation, sheeting, and (or) matting will be used to protect areas susceptible to erosion? If yes, give details. If no, explain: Revegetation, or mulch as needed, will be used to mitigate erosion.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Water control systems used during segmental reclamation will:	
Divert clean water around pit?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Trap sediment-laden runoff before it enters a stream?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Be established to prevent erosion of setbacks and neighboring properties?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Be removed or reclaimed?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If any answers are no, explain:	

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Stormwater system design will be capable of carrying the peak flow of the 25-year, 24-hour precipitation event? (Data are available at the National Oceanic And Atmospheric Administration (NOAA)) If yes, are calculations attached? If yes, give details. If no, explain: Stormwater from above the extraction area will be diverted by the topsoil berm downslope around the mine disturbance to infiltrate southeast of the mine. The overall disturbed area will only be about 2x the final floor area, requiring only about 0.2 inches/hour infiltration rate, which is very low for the rocky soils on site. There is also an infiltration area on a vegetated slope south of the operations area within the permit boundary to infiltrate stormwater. The combined infiltration area is significantly in excess of what is required for a 25-year, 24-hour storm.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Natural and other drainage channels will be kept free of equipment, wastes, stockpiles, and overburden? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
25. RECLAMATION TOPOGRAPHY	
25A. Final Slopes	
Final slopes will be created using the cut-and-fill method? Explain procedure to be used: Some fill will be placed for the operations area at the south part of the mine and will remain after completion of mining. The fill slope will be graded at 3H:1V or flatter.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Slopes will be created by mining to the final slope using the cut method? Explain procedure to be used: Final cut slopes will be excavated with a slope gradient at 2H:1V.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Slopes will vary in steepness? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Slopes will have a sinuous appearance in both profile and plan view? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Large rectilinear (that is, right angle, or straight, planar) areas will be eliminated? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Where reasonable, tracks of the final equipment pass will be preserved and oriented to trap moisture, soil, and seeds, and to inhibit erosion? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
25B. Slope Requirements for Pits and Overburden/Waste Rock Dumps (non-saleable products)	
<i>If the mine is a quarry or in hard rock, skip to Quarry section (25C).</i>	
Slopes will vary between 2 and 3 feet horizontal to 1 foot vertical or flatter, except in limited areas where steeper slopes are necessary to create sinuous topography and control drainage? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
For pits, slopes will not exceed 2 feet horizontal to 1 foot vertical except as necessary to blend with adjacent natural slopes? Give details: Final cut slopes will be excavated with a slope gradient at 2H:1V. The final fill slope for the reclaimed operations area will be at 3H:1V.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Review "Additional Requirements for Mines with Steep or Potentially Unstable Slopes" in "Instructions for SM-8A".	
Slope stability analysis required? If yes, attach analysis.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no

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25C. Slope Requirements for Quarries and Hardrock Metal Mines	
<i>If mine is a pit in unconsolidated materials covered by Section 25B, go to Section 25D</i>	
Check the appropriate box(es)	<u>NOTE:</u> If hard bedrock is encountered, the following project details will be incorporated into the mine plan.
<input checked="" type="checkbox"/> Slopes will not exceed 2 feet horizontal to 1 foot vertical.	
<input type="checkbox"/> Slopes steeper than 1 foot horizontal to 1 foot vertical are an acceptable subsequent land use as confirmed on Form SM-6.	
<input type="checkbox"/> Hazardous slopes or cliffs are indigenous to the immediate area and already present a potential threat to human life. Photo and maps attached to document presence of cliffs.	
<input type="checkbox"/> Geologic or topographic characteristics of the site preclude slopes being reclaimed at a flatter angle and are an acceptable subsequent land use as confirmed on Form SM-6.	
Review "Additional Requirements for Mines with Steep or Potentially Unstable Slopes" in "Instructions for SM-8A".	
Slope stability analysis required? If yes, attach analysis.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Measures will be taken to limit access to the top and bottom of hazardous slopes? Describe measures, or if no, explain: Blasting is not anticipated but may occur only for a limited depth at the bottom of the excavation and will be cut using shallow benches at about 20-30 vertical feet.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Selective blasting will be used to remove benches and walls and to create chutes, buttresses, spurs, scree slopes, and rough cliff faces that appear natural? Blasting plan attached?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If no, explain: Blasting is not anticipated at this time. If mining encounters hard bedrock requiring blasting, selective blasting of the final cut will be implemented to result in slopes at 2H:1V or less steep.	
Reclamation blasting will be used to reduce the entire highwall to a scree or rubble slope less than 2 feet horizontal to 1 foot vertical? Blasting plan is attached?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
If no, explain: Most (or all) of the final slopes will not require blasting. Any blasted bedrock will be reduced to a scree or rubble slope at 2H:1V or less steep.	
Access to benches will be maintained for reclamation blasting? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Small portions of benches will be left to provide habitat for raptors and other cliff-dwelling birds?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
25D. Backfilling	
The site will require backfilling? If no, skip to 25E. Maximum depth of backfilling is __ feet.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Backfill will be <input type="checkbox"/> onsite materials <input type="checkbox"/> imported materials <input type="checkbox"/> both Provide a written screening method that ensures importation of acceptable soil for reclamation.	<input type="checkbox"/> yes <input type="checkbox"/> no
Backfilling plan is attached? If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Backfill stockpiles are shown on maps and will be marked on the ground with markers?	<input type="checkbox"/> yes <input type="checkbox"/> no
All grading/backfilling will be done with non-noxious, non-combustible, and relatively incompactible solids? If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Backfill will require compaction? If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Will you be backfilling to create slopes? Is slope stability analysis attached? If no, explain.	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no

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25E. Mine Floors	
Flat areas will be formed into gently rolling mounds? If yes, give details. If no, explain: Mine floor will receive topsoil with gently undulating grades.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Mine floor will be gently graded into sinuous drainage channels to preclude sheetwash erosion during intense precipitation? If yes, give details. If no, explain: The mine floor will have a shallow, sinuous drainage channels to divert drainage across the floor for infiltration.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Mine floor and other compacted areas will be bulldozed, plowed, ripped, or blasted to foster revegetation? If yes, give details. If no, explain: Mine floor/compacted areas will be ripped prior to topsoil placement.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
25F. Lakes, Ponds, and Wetlands	
Is water currently present in the area or will the mining penetrate the water table? <i>If no, go to Section 25G.</i>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Reclaimed areas below the permanent low water table in soil, sand, gravel, and other unconsolidated material will have a slope no steeper than 1.5 feet horizontal to 1 foot vertical? If yes, give details. If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
If not already present, soils, silts, and clay-bearing material will be placed below water level to enhance revegetation? If yes, give details. If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Some parts of pond and lake banks will be shaped so that a person can escape from the water?	<input type="checkbox"/> yes <input type="checkbox"/> no
Armored spillways or other measures to prevent undesirable overflow or seepage will be provided to stabilize bodies of water and adjacent slopes? If yes, give details. If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Wildlife habitat will be developed, incorporating such measures as: Sinuous and irregular shorelines? Varied water depths? Shallow areas less than 18 inches deep? Islands and peninsulas? Give details:	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
Ponds or basins will: Be located in stable areas? Have sufficient volume for expected runoff? Have an emergency overflow spillway? Spillways and outfalls will be protected (for example, rock armor) to prevent failure and erosion? If any answers are no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
Proper measures will be taken to prevent seepage from water impoundments that could cause flooding outside the permitted area or adversely affect the stability of impoundment dams or adjacent slopes? If yes, give details. If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Written approval from other agencies with jurisdiction to regulate impoundment of water is attached? If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
25G. Final Drainage Configuration	
Drainages will be constructed on each reclaimed segment to control surface water, erosion, and siltation? Result in essentially natural conditions of volume, velocity, and turbidity? Clean runoff is directed to a safe outlet? If yes, give details. If no, explain: Stormwater will be contained and directed by the final mine excavation to the mine floor for infiltration.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Are these shown on maps?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no

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26. SITE CLEANUP AND PREPARATION FOR REVEGETATION	
26A. Dealing with Hazardous Materials	
Hazardous materials are present at the mine site? <i>If no, go to Section 26B</i>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
The final ground surface drains away from any hazardous natural materials? If yes, give details. If no, explain:	<input type="checkbox"/> yes <input type="checkbox"/> no
Plan for handling hazardous mineral wastes indigenous to the site is attached? If no, written approval from all appropriate solid waste regulatory agencies attached?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
26B. Removal of Debris	
All debris (garbage, 'bone piles', treated wood, old mining equipment, etc.) will be removed from the mine site? All sheds, scale houses, and other structures will be removed from the site? If either answer is yes, give details. If no, explain: All debris will be removed from the site. Ancillary structures may remain if deemed useful for future forestry use (e.g., equipment storage).	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
27. REVEGETATION	
The mine site is in: <input checked="" type="checkbox"/> eastern Washington <input type="checkbox"/> western Washington	Revegetation area is: <input type="checkbox"/> wet <input checked="" type="checkbox"/> dry <input type="checkbox"/> both
The average precipitation is 21 inches per year.	
Revegetation will start during the first proper growing season (fall for grasses and legumes, fall or late winter for trees and shrubs) following restoration of mine segments? If yes, give details. If no, explain: Refer to Revegetation Plan in the Narrative.	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
The site will not be revegetated because: <input type="checkbox"/> It is a rural area with a rainfall exceeding 30 inches annually and erosion will not be a problem (requires approval of DNR). <input type="checkbox"/> Revegetation is inappropriate for the approved subsequent use of this surface mine. Explain:	
27A. Recommended Pioneer Species	
In the Sections below, check the species that will be planted at your mine site: <i>* indicates nitrogen-fixing species</i>	
Western Washington Dry Areas	
<input type="checkbox"/> alfalfa* <input type="checkbox"/> lupine* <input type="checkbox"/> clover* <input type="checkbox"/> orchard grass	<input type="checkbox"/> cereal rye <input type="checkbox"/> perennial rye <input type="checkbox"/> colonial bent grass <input type="checkbox"/> ponderosa pine
<input type="checkbox"/> creeping red fescue <input type="checkbox"/> red alder* <input type="checkbox"/> Douglas fir <input type="checkbox"/> shore pine	<input type="checkbox"/> ground cover <input type="checkbox"/> shrubs <input type="checkbox"/> other
Western Washington Wet Areas	
<input type="checkbox"/> birdsfoot trefoil <input type="checkbox"/> sedges <input type="checkbox"/> cedar <input type="checkbox"/> tubers	<input type="checkbox"/> cottonwood <input type="checkbox"/> wetland grasses <input type="checkbox"/> creeping red fescue <input type="checkbox"/> willow
<input type="checkbox"/> red alder* <input type="checkbox"/> other	
Eastern Washington Dry Areas	
<input type="checkbox"/> alder* <input type="checkbox"/> grasses <input type="checkbox"/> alfalfa* <input type="checkbox"/> juniper	<input type="checkbox"/> black locust <input type="checkbox"/> lodgepole pine <input type="checkbox"/> clover <input type="checkbox"/> lupine*
<input type="checkbox"/> deciduous trees <input checked="" type="checkbox"/> ponderosa pine <input type="checkbox"/> shrubs <input type="checkbox"/> deep-rooted ground cover	<input type="checkbox"/> diverse evergreens <input checked="" type="checkbox"/> other Douglas fir, western larch
Eastern Washington Wet Areas	
<input type="checkbox"/> alder* <input type="checkbox"/> cottonwood <input type="checkbox"/> poplar <input type="checkbox"/> sedges	<input type="checkbox"/> serviceberry <input type="checkbox"/> tubers <input type="checkbox"/> willow
<input type="checkbox"/> other	

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Give planting details (stems/acres of trees and shrubs, see Forest Practices manual ; lbs/acre of grass, legume, or forb mixture): Refer to Revegetation Plan in the Narrative	
Describe weed control plan: Will implement BMPs in consultation with Stevens County Weed Board.	
27B. Planting Techniques	
Revegetation at this site will require:	
Ripping and tilling?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Blasting to create permeability?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Mulching?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Irrigation?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Fertilization?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Importation of clay- or humus-bearing soils?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Other soil conditioners or amendments?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Give details: Refer to Revegetation Plan in the Narrative.	
Trees and shrubs will be planted in topsoil or in subsoil amended with generous amounts of organic matter? If yes, give details. If no, explain: Native species for the region will be planted in replaced topsoil from the site and will not require organic-matter amendment.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Mulch will be piled around the base of trees and shrubs?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
High quality stock will be used?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Trees and shrubs will be planted while they are dormant?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Stock will be properly handled, kept cool and moist, and planted as soon as possible?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Seeds will be covered with topsoil or mulch no deeper than one-half inch?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If any answers are no, explain: Not required, and mulch can promote rodent girdling of tree saplings.	
28. FINAL CHECKLIST	
All required maps are attached? (<i>See "Instructions for SM-8A" for detailed requirements.</i>)	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
All required cross sections are attached? (<i>See "Instructions for SM-8A" for detailed requirements.</i>)	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Geologic map attached (if required)? (<i>See "Instructions for SM-8A" for detailed requirements.</i>)	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
All documents submitted have the date, the name and address of the permit holder, and the application number?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Have you completed the SM-6 and has it been signed by the local jurisdiction?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Have you provided the SEPA checklist?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Have you provided a copy of the SEPA determination (DNS, MDNS, or DS)? DNR to conduct SEPA review.	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Have you attached photographs (as needed)?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Are additional supplemental studies included?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If yes, check the appropriate box(es) below:	
<input type="checkbox"/> Archeological <input type="checkbox"/> Geohydrologic <input type="checkbox"/> Backfill <input type="checkbox"/> Slope stability	
<input type="checkbox"/> Topsoil <input type="checkbox"/> Flood plain <input type="checkbox"/> Conservational <input type="checkbox"/> Vegetation	
<input type="checkbox"/> Other	
Other permits required? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	
If yes, check the appropriate box(es) below:	
<input type="checkbox"/> Shoreline Permit <input type="checkbox"/> Water Discharge Permit <input type="checkbox"/> Solid Waste Permit	
<input type="checkbox"/> Air Quality Permit <input checked="" type="checkbox"/> NPDS or General Discharge Permit <input type="checkbox"/> Hydraulic Project Approval	
<input type="checkbox"/> Special or Conditional Use Permit <input type="checkbox"/> Other	

APPLICATION FOR RECLAMATION PERMIT AND PLAN

IDENTIFICATION OF LANDOWNER(S)

Identify names and addresses of all landowners. Provide written evidence of landowner approval of the extraction of minerals by surface mining methods and of the reclamation plan and/or provide the signature of all landowners below. If landownership has been severed between surface and mineral rights ownership, identify all affected mineral rights owner(s) and provide their approval. (*Attach signed copies of this page if more than one.*)

Print Name(s): Vaagen Brothers Lumber, Inc.

Address(es): 565 West 5th Avenue
Colville WA 99114

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APPLICANT ACKNOWLEDGMENT

By signing this application, the applicant acknowledges the following:

- **Application's Information True.** The applicant verifies that all information on this application and reclamation plan is true.
- **Reclamation Plan Contents.** The applicant's reclamation plan consists of this document (SM-8A), SM-6, associated maps, cross sections, reclamation narrative, and other attachments. The department's approval of this application would reflect approval of the applicant's reclamation plan.
- **Applicant/Permit Holder Must Comply.** If the department approves this application, the applicant shall be the permit holder and shall be responsible for compliance with Chapter 78.44 RCW, Chapter 332-18 WAC, the terms and conditions of the permit, and the approved reclamation plan and attachments. *The permit holder shall comply with the permit and may not significantly deviate from the reclamation plan without prior written approval by the department for the proposed change.* Revised permits or modified plans might be necessary following significant deviations.
- **Applicant/Permit Holder Consents to Inspection.** All permitted surface mines are subject to regular inspection. See RCW78.44.161 and WAC 332-18-050. The applicant verifies that it has authority to consent to department inspections on behalf of itself and the landowner(s). *Applicant authorizes the department to enter and inspect any property covered by this application during any day or time determined necessary by the department to ensure compliance with the Surface Mining Act, Surface Mining Rules, the Reclamation Permit, and the Reclamation Plan.*

APPLICANT

Signature of surface mine permit applicant or applicant's company representative

Name and Title of Company Representative
(Please print)

Date signed

Kurtis Vaagen

Kurtis Vaagen Vice President

6-6-24

LANDOWNER(S)

As landowner, I *Kurtis Vaagen* 6-6-24 (name) authorize the applicant to extract minerals from my land using surface mining methods and I approve this reclamation plan.

Signature:

Kurtis Vaagen

Date signed:

6-6-24

FOR DEPARTMENTAL USE ONLY

Date accepted

Accepted by:

Title:

Reclamation Permit No.

APPENDIX B

DNR FORM SM-6 – COUNTY OR MUNICIPALITY APPROVAL FOR SURFACE MINING

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**COUNTY OR MUNICIPALITY
APPROVAL FOR
SURFACE MINING
(Form SM-6)**

NAME OF COMPANY OR INDIVIDUAL APPLICANT(S) <small>Same as name of the exploration permit holder. (Type or print in ink)</small> <p style="text-align: center;">Vaagen Brothers Lumber, Inc.</p>		TOTAL ACREAGE AND DEPTH OF PERMIT AREA <small>(Include all acreage to be disturbed by mining, setbacks, and buffers, and associated activities during the life of the mine.) (See SM-8A)</small> Total area permitted will be <u>42.8</u> acres Maximum vertical depth below pre-mining topographic grade is <u>100</u> feet Maximum depth of excavated mine floor is <u>2,320</u> feet relative to mean sea level																											
MAILING ADDRESS <p style="text-align: center;">565 West 5th Avenue Colville, WA 99114</p> Telephone 509-680-1773		COUNTY <u>Stevens</u> <small>No attachments will be accepted. Legal description of permit area.</small> <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>1/4</th> <th>1/4</th> <th>Section</th> <th>Township</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>SE</td> <td>NW</td> <td>12</td> <td>33N</td> <td>40E</td> </tr> <tr> <td>NE</td> <td>NW</td> <td>12</td> <td>33N</td> <td>40E</td> </tr> <tr> <td>NW</td> <td>NW</td> <td>12</td> <td>33N</td> <td>40E</td> </tr> <tr> <td>SW</td> <td>NW</td> <td>12</td> <td>33N</td> <td>40E</td> </tr> </tbody> </table>			1/4	1/4	Section	Township	Range	SE	NW	12	33N	40E	NE	NW	12	33N	40E	NW	NW	12	33N	40E	SW	NW	12	33N	40E
1/4	1/4	Section	Township	Range																									
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NE	NW	12	33N	40E																									
NW	NW	12	33N	40E																									
SW	NW	12	33N	40E																									
Proposed subsequent use of site upon completion of reclamation <p style="text-align: center;">Forestry</p> <div style="text-align: right; color: blue; font-weight: bold; font-size: 1.2em;"> <p>RECEIVED</p> <p>June 11, 2024</p> <p>Washington Geological Survey</p> </div>																													
Signature of company representative or individual applicant(s) 		Name and title of company representative (please print) <p style="text-align: center;">Kurtis Vaagen Vice President</p>		Date signed <p style="text-align: center;">6-6-24</p>																									
TO BE COMPLETED BY THE APPROPRIATE COUNTY OR MUNICIPALITY:																													
Please answer the following questions 'yes' or 'no'. 1. Has the proposed surface mine been approved under local zoning and land-use regulations? 2. Is the proposed subsequent use of the land after reclamation consistent with the local land-use plan/designation?				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: 0.8em;">Yes</th> <th style="font-size: 0.8em;">No</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table>	Yes	No	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			
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When complete, return this form to the Department of Natural Resources.																													
Name of planning director or administrative official (please print) <p style="text-align: center;">EVELYN TICHACEK</p>		Address <p style="text-align: center;">260 S. Oak St Courthouse Annex Colville, WA 99114</p>																											
Signature 		Title (please print) <p style="text-align: center;">Planner</p>																											
Telephone <p style="text-align: center;">509-684-2401</p>	Date <p style="text-align: center;">6-10-2024</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; font-weight: bold; font-size: 0.8em;">FOR DEPARTMENT USE ONLY:</td> <td style="width: 50%; text-align: center;">DNR Reclamation Permit No. <p style="font-size: 1.2em;">70-013303</p></td> </tr> </table>			FOR DEPARTMENT USE ONLY:	DNR Reclamation Permit No. <p style="font-size: 1.2em;">70-013303</p>																							
FOR DEPARTMENT USE ONLY:	DNR Reclamation Permit No. <p style="font-size: 1.2em;">70-013303</p>																												

SURFACE MINE RECLAMATION PERMIT APPLICATION

MAJOR ROAD MINE

Permit Holder:

Vaagen Brothers Lumber, Inc.

Operator:

Vaagen Brothers Lumber, Inc.

Mailing Address:

565 West 5th Avenue
Colville WA 99114

Physical Location:

2940 Leslie Creek Road
Chewelah WA 99109
Stevens County

Facility Contact:

Jeff Waterman
(509) 680-1773

May 31, 2024

Washington State Department of Natural Resources
Washington Geological Survey

Prepared by:



17600 Pacific Highway, Unit 357
Marylhurst, Oregon 97036

Project: 012.02.01

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1.0 INTRODUCTION

On behalf of Vaagen Brothers Lumber, Inc. (Vaagen), Fulcrum GeoResources LLC (Fulcrum) has prepared this surface mine reclamation permit application for the DNR Washington Geological Survey Surface Mine Reclamation Program intended to satisfy DNR requirements pursuant to Chapter 78.44 Revised Code of Washington. This reclamation permit application includes this narrative, Figures 1 through 6, and the following appendices:

- Appendix A – DNR form SM-8A, Application for Reclamation Permit
- Appendix B – DNR form SM-6, County or Municipality Approval for Surface Mining
- Appendix C – SEPA Environmental Checklist
- Appendix D – Well Logs

Acronyms and abbreviations used herein are defined in Section 9.0 of this document.

2.0 SITE DESCRIPTION

2.1 SITE LOCATION

The Major Road Mine is located at 2940 Leslie Creek Road in tax parcel 2622401 approximately 8 miles north of Chewelah in Stevens County, Washington. The site located in all four quarters of the NW ¼ of Section 12, Township 33 North, Range 40 East of the Willamette Meridian (Figures 1 and 2).

2.2 BACKGROUND

The site is located on the southwest flank of a ridge projecting into a wide valley occupied by three streams: North Fork Chewelah Creek, the main stem flowing southwest through the valley; Bayley Creek, a tributary occupying the valley upstream to the north; and Leslie Creek, a smaller tributary that joins Bayley Creek just before its confluence with North Fork Chewelah Creek. Site elevations range from about 2,250 to 2,700 feet MSL (Figure 3). Slope gradients within the permit area are generally moderate with the steepest slope at about 65 percent in the northeast corner. The steepest slope within the limits of extraction (LOE) is about 30 percent. The site is well vegetated with conifer trees and brush. Past logging activities have resulted in several graded access roads on the site (Figure 3). Two such access roads define the east and west permit boundaries.

Vaagen plans to mine the site for aggregate materials to provide crushed rock and fill for road construction and maintenance on timber management roads. The resource consists of glacial drift, colluvium, and weathered quartzite bedrock. The site is zoned Rural Area (RA-10), which allows mining as an outright permitted use in Stevens County. As such, DNR will issue the first permit for the proposed mine project, requiring a SEPA environmental review. A SEPA checklist is provided in Appendix C.

2.3 SUBSEQUENT USE

The site is undeveloped and has been used for forestry. At final reclamation, the site will be returned to forestry use. Stevens County approved this subsequent use in the DNR Form SM-6, County or Municipality Approval for Surface Mining (Appendix B).

3.0 GEOLOGY AND HYDROGEOLOGY

3.1 GEOLOGY

DNR geologic mapping indicates the site vicinity is underlain by Cambrian and Proterozoic metasedimentary rocks folded and faulted by compressional tectonics (Lindsey, 1988). Bedrock ridges located east and west of Leslie Creek, including the eastern portion of the permit area, are mapped as the Addy Quartzite, a low-grade metamorphic rock derived from marine sandstones that dip to the west at 30 to 35 degrees. The Addy Quartzite likely underlies the entire site, buried by undifferentiated glacial deposits ("drift") and colluvium. Pleistocene glaciations ended about 15,000 years ago, resulting in accumulation of glacial drift along the lower ridges and valley floors around the region, overlain by younger alluvium deposited near current river channels. The proposed LOE are almost entirely mapped within glacial drift (Lindsey, 1988).

Vaagen excavated 13 test pits on the site and encountered gravelly soils with varying amounts of clay, silt, and sand to depths up to 14 feet BGS. Fulcrum visited the site after the test pits had been backfilled and observed some gravel cuttings still exposed at the surface. The gravel had some variability in lithology but was mostly composed of weathered red to brown, angular to subrounded quartzite, likely representing proximal glacial deposits and colluvium derived from the Addy Quartzite.

Well logs available from the Washington Department of Ecology indicate two wells that were drilled about 1,500 feet west of the permit boundary encountered 80 to 100 feet of glacial drift over bedrock (Rosselet and Rust wells in Appendix D). A well installed about 900 feet south of the permit boundary encountered 75 feet of sand and gravel, interpreted as valley alluvium and glacial deposits, over "soft" (i.e., weathered) quartzite (Clark well in Appendix D).

3.2 HYDROGEOLOGY

Surface streams and wetlands are not located within the proposed permit boundary based on review of aerial photos, DNR's FPAMT, and the U.S. Fish and Wildlife Service's National Wetlands Inventory. Leslie Creek (a fish-bearing stream according to FPAMT) is mapped offsite at least 200 feet west of the permit boundary and more than 500 feet west of the LOE (Figures 3 to 5). This creek flows south to the confluence with Bayley Creek (another fish-bearing stream per FPAMT) about 4,000 feet south of the permit boundary (Figure 1).

Four water wells were located within about a ½-mile of the site based on review of available well logs with locatable information. The Rosselet and Rust wells report water-bearing zones in bedrock at 145 and 220 feet BGS, respectively, with corresponding static water levels at 125 and 90 feet BGS, indicating some confinement of the bedrock aquifer. The other two wells were

developed in valley alluvium and underlying glacial deposits with static water levels between 30 to 55 feet BGS (Clark and Knauss wells in Appendix D). Groundwater underlying the site, which is located on a ridge flank similar to the Rosselet and Rust well locations, is anticipated to be within bedrock below the proposed depth of mining. The shallower water levels reported in the Clark and Knauss wells south of the site are representative of the valley floor, which do not reflect the interpreted characteristics of the sloped, upland mine site.

4.0 MINING AND RECLAMATION

The permit boundary for this site includes 42.8 acres, approximately 13 acres of which will be disturbed by mineral extraction and other mining disturbance. The reclamation sequence map is shown on Figure 4, and the final topography map is shown on Figure 5. Cross sections showing the existing and final slopes are presented on Figure 6. The maximum depth of mining is approximately 100 feet BGS to a final mine floor at 2,320 feet MSL. Glacial drift, colluvium, and weathered bedrock will be extracted for use as aggregate resource. Should hard, intact bedrock be encountered shallower than planned, extraction may be halted short of the proposed mining depth; or limited blasting of hard bedrock may be conducted using shallow benches at about 20 to 30 vertical feet. Mining is projected to occur over the next 15 years and will involve the removal of approximately 433,000 cubic yards of resource material, overburden, and topsoil.

Mining-related activities will consist of soil excavation and storage in perimeter berms and designated storage areas; resource excavation using conventional earthwork equipment (i.e., loaders and excavators); temporary stockpiling of material; crushing and screening of material into product stockpiles; and hauling to and from the processing area. Blasting is not anticipated; but if hard bedrock is encountered toward the end of mining, controlled blasting will be used to extract bedrock resource. Offsite haul traffic will use the existing gravel access road off of Major Road.

Overburden will be used as fill to create the operations, processing, and resource stockpiling area shown on Figure 4. Approximately 38,000 cubic yards of overburden will ultimately be placed, though the operations area will grow to this size over time as mining advances across the site. The filled area will be incorporated into the final contours of the reclaimed site. Overburden used as fill will be free of organics; placed in lifts using bulldozers or other heavy equipment; and track-compacted into place to a firm, unyielding condition. Lifts will generally not exceed 2 feet in thickness. If the fill material has significant fines, it will be placed during dry weather or when not excessively above optimum moisture content.

Mined slopes will be reclaimed and revegetated as they reach their final configuration in general accordance with the sequence presented on Figure 4. Final slopes will not exceed 2H:1V using a cut-slope method of mining. Figure 5 illustrates the final configuration of the reclaimed mine area upon completion of mining activities. Any blasted bedrock will be reduced to a scree or rubble slope at 2H:1V or less steep and blend into the overlying excavated slopes. Final mine slopes and the finished floor will be capped with topsoil and revegetated as described below.

4.1 TOPSOIL AND SUBSOIL PLAN

The U.S. Department of Agriculture – Natural Resources Conservation Service’s Web Soil Survey maps soils in the proposed permit area as Rock outcrop-Donovan complex, 30 to 65 percent in the northeast LOE; Aits loam, 25 to 40 percent over the rest of the LOE; and Aits loam, 15 to 25 percent southwest of the LOE. Typical soil profiles are as follows: Donovan soil (excluding rock outcrops) includes 8 inches of O and A horizons overlying 7 inches of B horizon; Aits loam includes 3 inches of O and A horizons overlying up to 57 inches of B horizons.

Topsoil observed in the test pits was approximately 12 inches thick over a subsoil ranging from about 12 to 24 inches thick. These thicknesses result in estimated volumes of 10,000 cubic yards of topsoil and up to 20,000 cubic yards of subsoil within the LOE, resulting in up to 30,000 cubic yards of growth medium available for site reclamation at the completion of mining.

Topsoil and subsoil will be stored in perimeter berms around the LOE (Figure 4) and in temporary stockpiles as needed over the course of mining. Final slopes and the mine floor will receive up to 12 inches of subsoil then 12 inches of topsoil to support reforestation of the site. Compacted areas will be ripped prior to subsoil and topsoil placement.

4.3 SETBACKS

A minimum 50-foot permanent setback is established and will be maintained around the permit boundary (Figures 3 through 6). Increased, voluntary setbacks ranging from 280 to 500 feet will be observed from the limits of extraction to the east and west permit boundaries, which are defined by existing, unimproved roadways (Figure 3). These voluntary increased setbacks will help mitigate potential noise and visual impacts to neighboring properties. Some topsoil and access roads may be located in the setbacks.

5.0 EROSION CONTROL

5.1 EXISTING STORMWATER

Currently, stormwater falls on the site and readily infiltrates into the underlying glacial deposits and colluvium. The absence of incised drainages eroded into the site slopes suggests stormwater rapidly infiltrates into the subsurface. Graded roads from past timber clearing also do not show signs of significant stormwater erosion. Any potential surface runoff down the slope would eventually infiltrate as the slope gradient diminishes down to the valley floor.

During mining, stormwater from above the extraction area will be diverted by the topsoil berm and a diversion ditch around the mine disturbance to infiltrate southeast of the mine. Mined slopes will direct stormwater from the disturbed area to the site interior for infiltration into the mine floor. Diversion ditches located below the fill slope will capture and direct runoff to an infiltration area.

5.3 POST-MINING STORMWATER

Post-mining stormwater will be contained within the permit boundary of the mine. The mine floor will have a shallow grade to allow for infiltration and divert drainage gradually to the south

toward moderate to gentle slopes below for additional infiltration. Stormwater volumes will be similar to what currently falls and infiltrates into the site subsurface.

6.0 REVEGETATION PLAN

The mine will be reforested for subsequent use as commercial forestry. A mix of western larch, Douglas fir, and ponderosa pine will be shovel or hoe planted for a total of 50 seedlings per acre. Douglas fir and ponderosa pine should account for 90 percent of the mix. A typical forest understory of woody stems and herbaceous species will re-establish naturally over time. Seedlings will be selected by seed zone (associated with elevation and location in the state). Proper handling and planting practices will be followed to assure the greatest potential for seedling survival.

Should noxious or invasive species propagate on site, they will be removed mechanically or by herbicide. The operator will consult with the Stevens County Weed Board during reclamation to develop weed control strategies.

7.0 REFERENCES

Lindsey, K.A., 1988. Geology of parts of the Upper Proterozoic to Lower Cambrian Three Sisters Formation, Gypsy Quartzite, and Addy Quartzite, Stevens and Pend Oreille Counties, northeastern Washington: DNR Division of Geology and Earth Resources, Open-File Report 88-3, 6 plates, scale 1:24,000.

U.S. Department of Agriculture, Natural Resources Conservation Service, n.d. Web Soil Survey: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

U.S. Fish and Wildlife Service, n.d. National Wetlands Inventory: <https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>.

U.S. Geological Survey, Geologic Hazards Science Center, n.d. U.S. Quaternary Faults: <https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf>.

Washington State Department of Ecology, n.d. Washington State Well Report Viewer: <https://appswr.ecology.wa.gov/wellconstruction/map/WCLSWebMap/default.aspx>.

Washington State Department of Natural Resources, n.d. Forest Practices Application Mapping Tool (FPAMT): <https://fpamt.dnr.wa.gov/2d-view#activity?-14866370,-12518225,5382613.6665532>

Washington State Department of Natural Resources, n.d. Washington Geologic Information Portal: <https://geologyportal.dnr.wa.gov/>.

8.0 LIMITATIONS

The services described in this narrative were provided consistent with generally accepted professional consulting principles and practices. Our narrative, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to areas other than the subject site. This narrative is prepared solely for the use of our client and may not be used or relied upon by a third party for any purpose. Any such use or reliance will be at such party's risk.

The opinions and recommendations contained in this narrative apply to conditions existing when services were performed. Fulcrum GeoResources LLC is not responsible for the impacts of changes in environmental standards, practices, or regulations after the date of this narrative. Fulcrum GeoResources LLC does not warrant the accuracy of information that was supplied by others as incorporated in this permit application.

Our interpretations of the mining and geologic conditions are based on discussions with the client, review of publicly available information, and exposures of soil and rock within the mine area. The accuracy of outside information is beyond our control.

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 this narrative was prepared. No warranty, express or implied, should be understood.

9.0 ACRONYMS AND ABBREVIATIONS

BGS	below ground surface
DNR	Washington State Department of Natural Resources
FPAMT	Forest Practices Application Mapping Tool
H:V	horizontal to vertical
LOE	limits of extraction
MSL	mean sea level
SEPA	Washington State Environmental Policy Act

Document ID: 012.02.01_2024-05-31_DNR permit.docx

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