

**APPENDIX A**

**DNR FORM SM-8A – APPLICATION FOR RECLAMATION PERMIT**

**RECEIVED**  
**June 27, 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".**

<b>1. NAME OF APPLICANT/PERMIT HOLDER(S)</b> Versatile Industries, Inc.			
<b>2. MAILING ADDRESS</b> P.O. Box 275 Ione, WA 99139			
<b>3. Telephone</b> 509-442-2444 <b>Email</b> kory@viidirt.com			
<b>4. NAME OF MINE</b> Shadow Valley Quarry			
<b>5. Street address and milepost of surface mine</b> Milepost 318.7 on U.S. Route 2			
<b>6. Distance (miles)</b> ~6	<b>7. Direction from</b> Southwest	<b>8. Nearest community</b> Diamond Lake	
<b>9. COUNTY</b> Pend Oreille No attachments will be accepted. Legal Description of permit area:			
1/4	Section	Township	Range
SW	13	30N	43E
NW	24	30N	43E
<b>10.</b> 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: <b>70-013217, 70-012996</b>			
<b>11.</b> 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 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):			

<b>12. TOTAL ACREAGE OF PERMIT AREA APPLIED FOR:</b> (Include all acreage to be permitted. See Form SM-6.) <u>73.7</u> acres	
<b>13. Total disturbed acreage</b> (Include all acreage to be disturbed by mining and reclamation during the life of the mine.) Total area to be disturbed: <u>~53</u> acres. Area to be disturbed in next 36 months: <u>10</u> acres.	
<b>14. Maximum vertical depth</b> (thickness) mined below pre-mining topographic grade will be <u>380</u> feet.	
<b>15. Lowest elevation</b> of excavated mine will be <u>2,360</u> feet relative to mean sea level. Highest elevation of excavated mine will be <u>2,830</u> feet relative to mean sea level.	
<b>16. Type of proposed or existing mine:</b> <input type="checkbox"/> pit <input checked="" type="checkbox"/> quarry	
<b>17. Material(s) to be mined:</b> <input 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 _____	
<b>18. Deposit type:</b> <input type="checkbox"/> glacial <input type="checkbox"/> river floodplain (alluvial) <input type="checkbox"/> river channel deposits <input type="checkbox"/> talus <input checked="" type="checkbox"/> bedrock <input type="checkbox"/> lode <input type="checkbox"/> other _____	
<b>19. Expected start date of mining:</b> <b>Summer 2024</b>	<b>20. Estimated number of years:</b> <b>~90 years</b>
<b>21. Total quantity to be mined over life of mine (estimated):</b> <b>~9 million (including topsoil, OB, and product)</b> <input type="checkbox"/> tons or <input checked="" type="checkbox"/> cu yds	<b>22. Estimated annual production:</b> <b>100,000</b> <input type="checkbox"/> tons or <input checked="" type="checkbox"/> cu yds
<b>23. Subsequent land use:</b> <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? <b>Approval pending</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	
<b>24. Reclaimed elevation of floor of mine:</b> <u>2,360</u> feet relative to mean sea level Reclaimed elevation is shown on cross sections? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	
<b>25. SEPA Checklist required?</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	
<b>26. Application fee for a new reclamation permit is herewith attached?</b> <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	

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<b>22. SEGMENTAL RECLAMATION</b>		
Permit area has been divided into segments for mining and a mining schedule has been developed?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
If no, explain:		
Permit area has been divided into segments for reclamation and a reclamation schedule has been developed?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
If no, explain:		
<b>23. SITE PREPARATION</b>		
<b>23A. Saving Topsoil, Subsoil, and Overburden for Reclamation</b>		
Thickness of topsoil is <u>0 to 0.8</u> feet	Thickness of subsoil is <u>~0</u> feet	Depth to bedrock is <u>0 to 0.8</u> feet
Total volume of topsoil is <u>21,000</u> cubic yards	Total volume of subsoil is <u>included with topsoil</u> cubic yards	
Volume of stored topsoil/subsoil is <u>21,000</u> cubic yards and will require <u>~2</u> acres for storage.		
Storage areas are shown on maps and will be marked on the ground with permanent boundary markers?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
Topsoil will be salvaged?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
If no, explain:		
Topsoil and overburden will be moved to reclaim an adjacent depleted segment?	<input type="checkbox"/>	yes <input checked="" type="checkbox"/> no
If no, explain: <b>Mine segments are vertically oriented. Topsoil and overburden will be placed in perimeter berms to stage for later use in reclamation as benched slopes achieve final grade and at completion of mining.</b>		
Before materials are moved, vegetation will be cleared and drainage planned for soil storage areas?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
If no, explain:		
Soil storage areas will be stabilized with vegetation to prevent erosion if materials will be stored for more than one season?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
If no, explain:		
<b>23B. Permit and Disturbed Area Boundaries</b>		
Boundary of the permit area will be marked on the ground with permanent boundary markers?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
Explain boundary markers: <b>Metal T-posts and perimeter fences.</b>		
<b>23C. Setbacks Screens and Buffers</b>		
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>30</u> feet wide.		
Is a permanent, undisturbed buffer planned for this site?	<input type="checkbox"/>	yes <input checked="" type="checkbox"/> no
If no, explain: <b>No buffers required. Setbacks will be used for topsoil storage and access.</b>		
Setbacks and buffers are shown on maps and have been marked on the ground with permanent boundary markers?	<input checked="" type="checkbox"/>	yes <input type="checkbox"/> no
If no, explain:		
<b>23D. Buffers to Protect Streams and Flood Plains</b>		
Will the site include a stream or flood plain?	<input type="checkbox"/>	yes <input checked="" type="checkbox"/> no
If yes, see "Additional Requirements for Mines in Flood Plains" in "Instructions for SM-8A". If no, skip to 23E.		
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?	<input type="checkbox"/>	yes <input type="checkbox"/> no
If no, explain:		
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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<b>23E. Conservation Buffers</b>	
Are there any conservation buffers?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
<b>If no, skip to 23F</b>	
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
<b>23F. Ground Water</b>	
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 <b>unknown</b> feet on _____ to _____ feet on _____.	
Are well logs attached? <b>No wells are located in the area that are representative of the site. Well logs from the surrounding area are attached.</b>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
The shallowest aquifer is <input type="checkbox"/> confined <input type="checkbox"/> unconfined <b>Unknown</b>	
The site will be mined: <input type="checkbox"/> wet <input checked="" type="checkbox"/> dry <input type="checkbox"/> both Describe mining method: <b>Bedrock will be mined by drilling and blasting in benches.</b>	
The site is in a: <b>N/A</b> <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
<b>If no, explain: Mining will occur on an isolated bedrock hill, and groundwater is not anticipated to be encountered by the proposed extraction. Water wells in the vicinity are either located greater than 1,000 feet from the site or are located west and north of US Route 2 and are likely recharged by the hills further west and north. Available well logs from the Dept of Ecology for the surrounding area report water-bearing zones or soft, fractured bedrock that is likely water-bearing from approximately 2,142 to 2,407 feet msl north of US Route 2 and the site; 2,346 feet msl east of the site; and 2,216 feet msl south of the site. Nearby well logs are attached (Appendix D).</b>	
<b>23G. Archeology</b>	
Are archeological/cultural resource sites present?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If yes, describe how you will protect these resources:	
<b>24. MINING PRACTICES TO FACILITATE RECLAMATION</b>	
<b>24A. Soil Replacement</b>	
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 * feet on the pit floor and a depth of * feet on slopes. <b>(*included with topsoil)</b> Topsoil will be replaced to an approximate depth of ** feet on the pit floor and a depth of ** feet on slopes <b>**Onsite topsoil will be in short supply and will be replaced in mounds. Refer to the Topsoil Plan in Section 4.1.</b>	
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:	

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Topsoil will be replaced with equipment that will minimize compaction, or it will be plowed, disked, or ripped following placement? If no, explain:	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Topsoil will be immediately stabilized with grasses and legumes to prevent loss by erosion, slumping, or crusting? If no, explain: <b>Establishing a grass cover is counterproductive to reforestation goals. No grasses will be seeded due to the competitive nature between grass and young tree seedlings. Clean, weed-free straw or mulch derived from tree debris will be installed over soil mounds.</b>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
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 checked="" type="checkbox"/> yes <input 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:	<input type="checkbox"/> yes <input checked="" 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
<b>24B. Removal of Vegetation</b>	
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: <b>High quality seedling stock will be utilized to reforest the site.</b>	<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 checked="" 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: <b>Stumps and logs can be placed on reclaimed areas for habitat when available.</b>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>24C. Stormwater and Erosion control for Reclamation</b>	
Pit floor will slope at gentle angles toward highwall, sediment retention pond, or proper drainage? If yes, give details. If no, explain: <b>Mine floor will direct stormwater to infiltration areas.</b>	<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: <b>Areas susceptible to erosion and replaced soil mounds will be mulched with clean, weed-free straw and/or mulch derived from tree debris.</b>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no

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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 type="checkbox"/> yes <input checked="" type="checkbox"/> no
If any answers are no, explain: <b>Some water control structures, such as water bars on reclaimed roadways, will remain to promote stabilizing the site from erosion. Infiltration in the floor will also continue after reclamation.</b>	
Stormwater system design will be capable of carrying the peak flow of the 25-year, 24-hour precipitation event? <i>(Data are available at the National Oceanic And Atmospheric Administration (NOAA))</i>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
If yes, are calculations attached?	
If yes, give details. If no, explain: <b>The mine floor will receive and contain all stormwater generated within the disturbance boundary of the mine, infiltrating into fractured bedrock. Bedrock permeability in the final floor infiltration basin will be tested and enhanced as needed with select blasting to achieve the required infiltration capacity.</b>	
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
<b>25. RECLAMATION TOPOGRAPHY</b>	
<b>25A. Final Slopes</b>	
Final slopes will be created using the cut-and-fill method? Explain procedure to be used:	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Slopes will be created by mining to the final slope using the cut method? Explain procedure to be used: <b>Final cut slopes will be excavated using the cut-bench method with a net slope gradient at 2H:1V with bench dimensions ranging from 30 to 40 feet vertical and 60 to 80 feet horizontal.</b>	<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
<b>25B. Slope Requirements for Pits and Overburden/Waste Rock Dumps (non-saleable products)</b>	
<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 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:	<input type="checkbox"/> yes <input type="checkbox"/> no
<b>Review "Additional Requirements for Mines with Steep or Potentially Unstable Slopes" in "Instructions for SM-8A".</b>	
Slope stability analysis required? If yes, attach analysis.	<input type="checkbox"/> yes <input type="checkbox"/> no

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<b>25C. Slope Requirements for Quarries and Hardrock Metal Mines</b>	
<i>If mine is a pit in unconsolidated materials covered by Section 25B, go to Section 25D</i>	
Check the appropriate box(es)	
<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 checked="" 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.	
<b>Review "Additional Requirements for Mines with Steep or Potentially Unstable Slopes" in "Instructions for SM-8A".</b>	
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: <b>Soil berms and posted warning signs will be located upslope of the final mined slopes.</b>	<input checked="" type="checkbox"/> yes <input 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? If no, explain: <b>Selective reclamation blasting may be used for final slope creation but is not planned at this time.</b>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input checked="" type="checkbox"/> no
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? If no, explain:	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
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 checked="" type="checkbox"/> yes <input type="checkbox"/> no
<b>25D. Backfilling</b>	
The site will require backfilling? <b>If no, skip to 25E.</b> 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
<b>25E. Mine Floors</b>	
Flat areas will be formed into gently rolling mounds? If yes, give details. If no, explain: <b>Quarry floor will have gently undulating grades where possible.</b>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no

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Mine floor will be gently graded into sinuous drainage channels to preclude sheetwash erosion during intense precipitation?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If yes, give details. If no, explain: <b>Gently graded drainage swales will be located at the bottom of final slopes to capture and direct stormwater east to an infiltration basin at the back of the final mine floor. Refer to the Final Topographic Map on Figure 6.</b>	
Mine floor and other compacted areas will be bulldozed, plowed, ripped, or blasted to foster revegetation?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If yes, give details. If no, explain: <b>Mine floor and other compacted areas will be ripped prior to topsoil placement.</b>	
<b>25F. Lakes, Ponds, and Wetlands</b>	
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?	<input type="checkbox"/> yes <input type="checkbox"/> no
Varied water depths?	<input type="checkbox"/> yes <input type="checkbox"/> no
Shallow areas less than 18 inches deep?	<input type="checkbox"/> yes <input type="checkbox"/> no
Islands and peninsulas?	<input type="checkbox"/> yes <input type="checkbox"/> no
Give details:	
Ponds or basins will:	
Be located in stable areas?	<input type="checkbox"/> yes <input type="checkbox"/> no
Have sufficient volume for expected runoff?	<input type="checkbox"/> yes <input type="checkbox"/> no
Have an emergency overflow spillway?	<input type="checkbox"/> yes <input type="checkbox"/> no
Spillways and outfalls will be protected (for example, rock armor) to prevent failure and erosion?	<input type="checkbox"/> yes <input type="checkbox"/> no
If any answers are no, explain:	
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
<b>25G. Final Drainage Configuration</b>	
Drainages will be constructed on each reclaimed segment to control surface water, erosion, and siltation?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Result in essentially natural conditions of volume, velocity, and turbidity?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Clean runoff is directed to a safe outlet? If yes, give details. If no, explain: <b>All drainage will be contained within the incised mine floor and infiltrated.</b>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Are these shown on maps?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no



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<b>26. SITE CLEANUP AND PREPARATION FOR REVEGETATION</b>	
<b>26A. Dealing with Hazardous Materials</b>	
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
<b>26B. Removal of Debris</b>	
All debris (garbage, 'bone piles', treated wood, old mining equipment, etc.) will be removed from the mine site?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input checked="" type="checkbox"/> yes <input type="checkbox"/> no
All sheds, scale houses, and other structures will be removed from the site? If either answer is yes, give details. If no, explain: <b>All debris will be removed from the site. Any structures brought to the site will be temporary in nature and removed at the completion of mining.</b>	
<b>27. REVEGETATION</b>	
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 <b>24 inches</b> 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?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
If yes, give details. If no, explain: <b>Refer to Section 6.0 Revegetation Plan for details.</b>	
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:	
<b>27A. Recommended Pioneer Species</b>	
In the Sections below, check the species that will be planted at your mine site: <i>* indicates nitrogen-fixing species</i>	
<b>Western Washington Dry Areas</b>	
<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
<b>Western Washington Wet Areas</b>	
<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	
<b>Eastern Washington Dry Areas</b>	
<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 <b>Douglas fir</b>
<b>Eastern Washington Wet Areas</b>	
<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	

# APPLICATION FOR RECLAMATION PERMIT AND PLAN

Give planting details (stems/acres of trees and shrubs, see [Forest Practices manual](#); lbs/acre of grass, legume, or forb mixture):

**Refer to Section 6.0 Revegetation Plan for details.**

Describe weed control plan:

**Deleterious vegetation and invasive species will be controlled mechanically or with herbicide.**

## 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 Topsoil Plan and Revegetation Plan in the Narrative.**

Trees and shrubs will be planted in topsoil or in subsoil amended with generous amounts of organic matter?  yes  no

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, other than for erosion control.**

Mulch will be piled around the base of trees and shrubs?  yes  no

High quality stock will be used?  yes  no

Trees and shrubs will be planted while they are dormant?  yes  no

Stock will be properly handled, kept cool and moist, and planted as soon as possible?  yes  no

Seeds will be covered with topsoil or mulch no deeper than one-half inch?  yes  no

If any answers are no, explain: **Seeding grass is not recommended; mulch will be used instead.**

## 28. FINAL CHECKLIST

All required maps are attached? (See *"Instructions for SM-8A" for detailed requirements.*)  yes  no

All required cross sections are attached? (See *"Instructions for SM-8A" for detailed requirements.*)  yes  no

Geologic map attached (if required)? (See *"Instructions for SM-8A" for detailed requirements.*)  yes  no

All documents submitted have the date, the name and address of the permit holder, and the application number?  yes  no

Have you completed the SM-6 and has it been signed by the local jurisdiction? **County approval pending through this application review.**  yes  no

Have you provided the SEPA checklist?  yes  no

Have you provided a copy of the SEPA determination (DNS, MDNS, or DS)?  yes  no

Have you attached photographs (as needed)?  yes  no

Are additional supplemental studies included?  yes  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?  yes  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): **Versatile Oldtown LLC**

Address(es): **P.O. Box 275  
Ione, WA 99139**

**RECEIVED**  
**June 27, 2024**  
**Washington Geological Survey**

## APPLICANT ACKNOWLEDGEMENT

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), 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 RCW 78.44.161 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)

**Kory Hedrick  
Vice President**

Date signed

**3/14/2024**

### LANDOWNER(S)

As landowner, I Kory Hedrick (name) authorize the applicant to extract minerals from my land using surface mining methods and I approve this reclamation plan.

Signature: 

Date signed: **3/14/2024**

### FOR DEPARTMENTAL USE ONLY

Date accepted

Accepted by:

Title:

Reclamation Permit No.

# 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): **Mark Smith**

Address(es): **318902 U.S. Route 2  
Newport, WA 99156-9328**

**RECEIVED**  
**June 27, 2024**  
**Washington Geological Survey**

## APPLICANT ACKNOWLEDGEMENT

**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), 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 RCW 78.44.161 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)

**Kory Hedrick  
Vice President**

Date signed

*3/14/2024*

### LANDOWNER(S)

As landowner, I Mark Smith (name) authorize the applicant to extract minerals from my land using surface mining methods and I approve this reclamation plan.

Signature:

*Mark Smith*

Date signed:

*4-14-24*

### 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**

**RECEIVED**  
**March 15, 2024**  
**Washington Geological Survey**





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

NAME OF COMPANY OR INDIVIDUAL APPLICANT(S) Same as name of the exploration permit holder. (Type or print in ink.)  <b>Versatile Industries, Inc.</b>		TOTAL ACREAGE AND DEPTH OF PERMIT AREA (Include all acreage to be disturbed by mining, setbacks, and buffers, and associated activities during the life of the mine.) (See SM-8A.) Total area permitted will be <u>73.7</u> acres Maximum vertical depth below pre-mining topographic grade is <u>380</u> feet Maximum depth of excavated mine floor is <u>2,360</u> feet relative to mean sea level					
MAILING ADDRESS  <b>P.O. Box 275 Ione, WA 99139</b>  Telephone <b>509-442-2444</b>		COUNTY <u>Pend Oreille</u>  No attachments will be accepted. Legal description of permit area.					
		1/4	1/4	Section	Township	Range	
		SW	SW	13	30N	43E	
		SE	SW	13	30N	43E	
		NW	NW	24	30N	43E	
Proposed subsequent use of site upon completion of reclamation  <b>Commercial forestry</b>							
<p><b>RECEIVED</b> <b>March 15, 2024</b> <b>Washington Geological Survey</b></p>							
Signature of company representative or individual applicant(s)  		Name and title of company representative (please print)  <b>Kory Hedrick Vice President</b>		Date signed  <b>3/15/2024</b>			
<b>TO BE COMPLETED BY THE APPROPRIATE COUNTY OR MUNICIPALITY:</b>							
Please answer the following questions 'yes' or 'no':						Yes	No
1. Has the proposed surface mine been approved under local zoning and land-use regulations?						<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is the proposed subsequent use of the land after reclamation consistent with the local land-use plan/designation?						<input checked="" type="checkbox"/>	<input type="checkbox"/>
When complete, return this form to the Department of Natural Resources. <b>*A CONDITIONAL USE PERMIT WILL ALLOW THE USE.</b>							
Name of planning director or administrative official (please print)  <b>GREG SNOW</b>			Address  <b>PO BOX 5066 NEWPORT, WA 99156</b>				
Signature  							
Title (please print)  <b>COMMUNITY DEVELOPMENT DIRECTOR</b>							
Telephone  <b>509 447 4821</b>		Date  <b>03/14/24</b>		FOR DEPARTMENT USE ONLY:		DNR Reclamation Permit No.  <b>70-013302</b>	

**SURFACE MINE RECLAMATION PERMIT APPLICATION**

**SHADOW VALLEY QUARRY**

**Applicant:**

Versatile Industries, Inc.

**Operator:**

Versatile Industries, Inc.

**Mailing Address:**

P.O. Box 275  
Ione, WA 99139

**Physical Location:**

Milepost 318.7 on U.S. Route 2  
Pend Oreille County

**Permitting Contact:**

Kory Hedricks  
(509) 442-2444

**March 15, 2024**

Washington State Department of Natural Resources  
Washington Geological Survey

**Prepared by:**



17600 Pacific Highway, Unit 357  
Marylhurst, Oregon 97036

Project: 027.02.01

**RECEIVED**  
**June 27, 2024**  
**Washington Geological Survey**

## **1.0 INTRODUCTION**

On behalf of Versatile Industries, Inc. (Versatile), Fulcrum GeoResources LLC 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 7, 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**

Shadow Valley Quarry is located approximately 15 miles southwest of Newport and 6 miles southwest of the community of Diamond Lake in Pend Oreille County, Washington. Access to the quarry is provided by a gravel access road east of U.S. Route 2 at approximately milepost 318.7. The mine permit area is located in tax parcels 2316 and 2487 (Figures 1 and 2) in the following quarter-quarter sections:

- SW and SE quarters of the SW quarter of Section 13, Township 30 North, Range 43 East
- NW quarter of the NW quarter of Section 24, Township 30 North, Range 43 East

### **2.2 BACKGROUND**

The site is located on the west and southwest flanks of an isolated hill near Rogers Pass east of U.S. Route 2 (Figure 1). Site elevations range from 2,310 to 2,830 feet MSL. Slope gradients generally range from 10 to 100 percent across most of the site except in the northeast corner, where a steep bluff descends north at gradients of 100 to 200 percent with some near-vertical rock exposures. The hill has sporadic coverage of thin soil, significant exposures of quartz monzonite bedrock, and is partially to mostly vegetated with trees, bushes, and grass. Past logging activities resulted in several graded access roads on the site (Figure 3).

Versatile plans to mine the site for crushed aggregate materials. The site is zoned Natural Resource Lands 20 (NR20), which allows mining as a conditional use in Pend Oreille County. The County requested that SEPA review of the mining project be transferred to DNR for the required surface mining reclamation permit. The County will rely on the resulting SEPA determination for their conditional approval of the project. A SEPA checklist is provided in Appendix C.



### **2.3 SUBSEQUENT USE**

At final reclamation, the quarry will be reclaimed for commercial forestry use as shown on the DNR Form SM-6 presented in Appendix B.

## **3.0 GEOLOGY AND HYDROGEOLOGY**

### **3.1 GEOLOGY**

The geology underlying the site consists of the Eocene Silver Point Quartz Monzonite (Miller, 1974; age-dated 46 to 51 million years old). The bedrock represents a granitic pluton that intruded the surrounding Precambrian metamorphic and igneous rock complex in the region. The nearest Precambrian metamorphic rocks are mapped in the valley floor about 1,000 feet south of the limits of excavation (Figure 3). The pluton extends for miles to the north, east, and west.

A thin mantle of soil has developed over portions of the site, but there are many natural exposures of rounded, platy, or blocky quartz monzonite formed by exfoliation typical of granitic rocks at the surface. Exfoliation cracks are well exposed as sub-horizontal, parallel partings in road cuts along U.S. Route 2. Primary rock joints are also readily visible in the road cuts, striking at multiple orientations and ranging in dip from 50 to 90 degrees. The vertical, unreinforced road cuts along the highway stand 20 to 40 feet tall without signs of recent block failure or significant rockfall. Well logs from Ecology's Well Report Viewer in the site vicinity report "granite" corresponding to the Silver Point Quartz Monzonite to depths at least 520 feet BGS. Well logs are included in Appendix D.

### **3.2 HYDROGEOLOGY**

Surface streams and wetlands are not located on the site. A fish-bearing stream is mapped on the other (west) side of U.S. Route 2 from the site and flows south parallel to the highway, according to the DNR FPAMT. Two discontinuous streams (identified as "unknown" by FPAMT) are mapped in drainages southeast of the site. They terminate after running less than 1,000 feet, apparently draining to an enclosed valley (Figures 3 to 6).

Water wells in the vicinity are either located greater than 1,000 feet from the site or are located west and north of U.S. Route 2 and are likely recharged by the hills further west and north. Available well logs from Ecology for the surrounding area (Appendix D) report water-bearing zones or soft, fractured bedrock that is likely water-bearing from approximately 2,142 to 2,407 feet MSL north of U.S. Route 2 and the site; 2,346 feet MSL east of the site; and 2,216 feet MSL south of the site. These elevations suggest the local water-bearing aquifer is located at least 10 feet below the proposed final mine floor of 2,360 feet MSL.

## **4.0 MINING AND RECLAMATION**

The permit boundary for this site includes 73.7 acres, approximately 53 acres of which will be disturbed by mineral extraction and other mining disturbance. The reclamation sequence map is shown on Figure 4. An interim topography map showing the completed mine segment M-1 is

provided on Figure 5. The final topography map is shown on Figure 6. Cross sections showing the existing, interim, and final slopes are presented on Figure 7. The maximum depth of mining is approximately 380 feet BGS. The final mine floor will be at 2,360 feet MSL and will be gently graded to drain into the mining disturbance toward the back (east) final slope. Mining is projected to occur over the next 90 years or more and will involve the removal of approximately 9,179,000 cubic yards of resource material, overburden, and topsoil.

Mining-related activities will consist of soil excavation and storage in designated storage areas; drilling and blasting to extract bedrock resource; loading and hauling pit run to the processing area; crushing, screening, and stockpiling in the processing area using a portable crusher; loading of rock products into commercial haul trucks; and occasional batching and loading of asphaltic concrete using of a portable asphalt plant and haul trucks brought to the site as needed for paving projects. Mining equipment will include excavators, front-end loaders, and dump trucks. Commercial access to the mine will be facilitated via an easement through the south project parcel (lot #2487 on Figure 2). The existing entrance off of the highway will be widened and resurfaced to accommodate haul traffic.

Mining will start approximately in the middle of the northern parcel at elevation 2,570 feet MSL (Figure 5). An interim processing and sales area will be located immediately south of the M-1 extraction area on the south parcel, which will be graded to create the operations pad with side slopes at a 3H:1V gradient. After completion of segment M-1, the mine will be advanced further down in elevation to a final floor of 2,360 feet MSL. When the mine floor is sufficiently large, processing and product stockpiling will be moved from the interim location to the mine floor. The location of processing, stockpiling, and sales will thereafter be relocated around the mine floor as needed during continued extraction, generally located in the western portion of the north parcel.

Mined slopes will be progressively reclaimed as they reach their final configuration in general accordance with the sequence presented on Figures 4 through 6. Sinuous post-mining slopes in the bedrock will not exceed 2H:1V using a cut-slope method of mining, with bench dimensions ranging from 30 to 40 feet vertical and 60 to 80 feet horizontal. Benches will remain to support reforestation of the mined slopes and to incorporate vertical rock exposures similar to those indigenous to the area for raptor and other avian habitat. Final mine slopes and the finished floor will receive topsoil and be revegetated as described below. Compacted areas will be ripped prior to topsoil placement.

#### **4.1 TOPSOIL PLAN**

The U.S. Department of Agriculture – Natural Resources Conservation Service’s Web Soil Survey maps the project area as being Rock outcrop-Moscow complex, 8 to 65 percent slopes. Rock outcrops compose more than 50 percent of the map unit. The Moscow soil unit description includes up to 10 inches of combined O and A soil horizons.

Observations on site and in road cuts indicate topsoil is mostly absent or thin where present to a maximum 10 inches thick. No significant subsoil was observed in these exposures other than a

partially decomposed weathering rind in the quartz monzonite. This rind could produce subsoil if more intensely weathered but would be discontinuous and localized. Topsoil, possible subsoil, and any encountered fine-grained deposits will be salvaged and stored in designated piles for later use in reclamation. An estimated 21,000 cubic yards of topsoil and other rooting medium may be available at the completion of mining assuming an in-situ average of 3 inches of topsoil.

Due to the natural scarcity of topsoil at the site and the anticipated lack of subsoil, fine-grained overburden, or other topsoil substitute, reclamation will require strategic placement of topsoil in mounds about 6 to 12 inches thick and about 10 feet in diameter on the mine floor and bench flats. The mounds will be covered with weed-free straw or mulch derived from tree debris to protect the replaced topsoil from erosion and help the soil retain moisture. This will preserve an adequate thickness of rooting medium for trees to revegetate the reclaimed mine, produce organic detritus, and create seed "islands" to naturally propagate more trees over time.

#### **4.2 SETBACKS AND BUFFERS**

A minimum 30-foot setback will be maintained interior to the permit boundary. Some disturbance such as for access roads or topsoil storage may occur in setback areas and will be reclaimed along with the rest of the completed mine site unless the access routes are necessary for post-mining site use.

### **5.0 EROSION CONTROL**

#### **5.1 EXISTING STORMWATER**

Currently, stormwater falls on the site and either infiltrates into soils and fractured bedrock or runs downhill, gradually concentrating in shallow drainages scoured into the bedrock surface. These drainages lead to the lower hill flanks to infiltrate into the lowland soils or to flow into the stormwater ditch along the east side of U.S. Route 2. The roadside ditch is discontinuous, and we did not observe culverts below two crossings from the highway onto the site. This suggests runoff accumulates and infiltrates along some portions the roadside ditch.

#### **5.2 INTERIM-STAGE STORMWATER**

While mining is focused on the uphill site during extraction of mine segment M-1, stormwater will be contained within the disturbed area and directed to designated basins in the interim mine floor for infiltration. The jointed bedrock will have infiltration capacity to manage design storm events, which can be augmented by select blasting of the infiltration basins and along drainage and infiltration swales to create additional permeability. Runoff from the interim processing area and access road will be controlled using ditches and check dams to collect runoff and diffusely discharge to vegetated areas within the site boundaries. Storage piles of topsoil reserved for reclamation will be seeded with an erosion control seed mix to stabilize the piles and prevent erosion.

#### **5.3 POST-MINING STORMWATER**

Post-mining stormwater will be contained on site by the final topography, which will direct stormwater to the mine floor to infiltrate into the jointed bedrock. The mine floor will have a

shallow grade to the east to divert drainage to the infiltration basin. Bedrock permeability in the final floor infiltration basin will be tested and enhanced as needed with select blasting to achieve the required infiltration.

## **6.0 REVEGETATION PLAN**

The mine will be reforested using a mix of Douglas fir and ponderosa pine. Bareroot or container trees will be supplied by a local nursery and from within the proper seed zone for this site. Bareroot 1+1 stock is preferred for reclaimed lands because it provides a good root-to-stem ratio. Two to four seedlings will be shovel or hoe planted into each replaced topsoil mound depending on the mound diameter. This will allow for some mortality while still establishing the desired seed "islands". A typical forest understory of organic debris, woody stems, and herbaceous species will re-establish naturally over time.

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

## **7.0 REFERENCES**

Miller, F.K., 1974. Preliminary geologic map of the Newport Number 3 quadrangle, Pend Oreille, Stevens and Spokane Counties, Washington: Washington Division of Geology and Earth Resources, Geologic Map GM- 9 [7 p., 1 sheet], scale 1:62,500.

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

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

Washington State Department of Natural Resources, n.d. Forest Practices Application Mapping Tool (FPAMT). Retrieved from <https://fpamt.dnr.wa.gov/2d-view#activity?-14866370,-12518225,5386282,6661863>.

Washington State Department of Natural Resources, n.d. Washington Geologic Information Portal. Retrieved from <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
Ecology	Washington Department of Ecology
FPAMT	Forest Practices Application Mapping Tool
H:V	horizontal to vertical
MSL	mean sea level
SEPA	Washington State Environmental Policy Act

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