



CRITICAL AREAS IMPACT ASSESSMENT

RANCH QUARRY
SOUTH PASS ROAD, WHATCOM COUNTY, WA

DECEMBER 2022

EXECUTIVE SUMMARY

Northwest Ecological Services, LLC (NES) was retained to complete an impact assessment for a gravel mine project known as the Ranch Quarry, in unincorporated Whatcom County, Washington. The following report describes the anticipated project effects on adjacent wetlands and habitat conservation areas. This report also outlines recommended compensatory mitigation measures to be employed in order to offset project impacts and retain watershed functions.

The proposed Ranch Quarry is approximately 80 acres and encompasses portions of five parcels (400518 466281, 400518 488379, 400518 479443, 400517 049475, 400517 18447). Access will be from South Pass Road via an existing logging road along the eastern extent of the mine. In addition to the mining operations, rock sorting and crushing activities will occur on site. There will be approximately three employees on site during mine operation. Approximately 25 trucks with mined material will be entering and exiting the site per day.

The expected life of the mine is approximately 30 years. A separate reclamation plan will be provided. The mining plan has undergone multiple revisions to result in no direct impacts to site wetlands and streams. However, buffer impacts, indirect wetland impacts, and pond impacts are expected. Specifically the fish and wildlife habitat functions provided by these features may be impacted. To comply with the Whatcom County Critical Areas Ordinance (CAO) and ensure no net loss of critical area function, the project will include compensatory mitigation for the impacted critical area functions. This includes on-site mitigation measures (wetland buffer restoration and stream buffer enhancement) as well as off-site habitat enhancement (pond, wetlands, buffers). With the mitigation measures recommended herein, the project is anticipated to result in no net loss of critical area function.

NES QUALIFICATIONS

NES is a specialized service-oriented environmental consulting firm based in Bellingham, Washington. We provide a range of biological services to both the public and private sectors. Our services include: wetland assessments, biological assessments, wetland restoration and mitigation plans, natural resource analysis, environmental regulatory compliance, landscape and ecological design, and environmental impact assessment of plants, animals, fish and sensitive habitats. NES professionals have performed wetland and biological assessments over 33,000 acres [1991-2021] in Whatcom, Skagit, Island, Snohomish, and King Counties.

NES staff qualifications summary:

- Molly Porter is an ecologist with NES and has provided environmental services within the north Puget Sound area since 2004. Ms. Porter obtained a Bachelor of Science in Environmental Science from Huxley College of the Environment at Western Washington University (WWU). She is certified through SWS as a PWS, #2064.
- Collin Van Slyke is an ecologist with NES, providing environmental services for projects throughout the north Puget Sound since 2014. Mr. Van Slyke obtained a Bachelor of Science in Environmental Science from Huxley College of the Environment at Western Washington University. He is certified through SWS as a PWS, #3129.
- Candice Trusty is an ecologist with NES and has been providing environmental services within the north Puget Sound since 2019. Ms. Trusty obtained a Bachelor of Science in Environmental Science from Huxley College of the Environment at Western Washington University. Her experience includes the assessment of wetland and fish & wildlife critical areas, fish removal, biological surveying, and habitat restoration. She is certified through SWS as a WPIT.
- Michael Whitehurst is an ecologist with NES. Mr. Whitehurst obtained a Bachelor of Science in Marine Biology from the University of West Florida and a certificate in wetland science and management from the University of Washington. His experience includes marine and freshwater organism identification, marine and terrestrial botany, and water quality sampling and analysis.
- Alexandre Pederson is an ecologist with NES with a Bachelor of Science in Ecological Engineering from Oregon State University. His experience includes bioremediation, watershed and stormwater management, and sampling and analysis of biological, chemical, and physical properties of soils.

DISCLAIMER

Wetland, stream, and lake delineations and determinations are based upon protocols defined in manuals and publications produced by federal, state and local agencies. The wetland methodology used in this report is consistent with methods described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Corps, 2010) and the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987), as required by WAC 173-22-035. The findings were based on observations of conditions at the time of the site visit(s).

Mitigation plans are developed to meet local regulations. This report does not guarantee agency concurrence or permit approval. This plan requires local agency concurrence prior to implementation. The recommendations are based on conditions at the time of the site visit(s) and development plans provided by the Client and Client representatives. Although the plan is carefully designed to facilitate success, no guarantees are given that the project will meet all performance standards. Project success depends on many unforeseen and uncontrollable events, achieving success can be greatly improved through:

- Ensuring a qualified ecologist is on site during mitigation project construction
- Installing the mitigation project as specified in this report
- Maintaining the mitigation project as specified in this report (ideally by a landscape professional that specializes in restoration and/or wetland mitigation)
- Implementing any recommended contingency measures in a timely manner

This report is provided for the use and named recipient only and is not intended for use by other parties for any purpose. This report does not guarantee agency concurrence or permit approval.

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1.0 INTRODUCTION

1.1 Scope of Work

Northwest Ecological Services, LLC (NES) was retained to complete an impact assessment for a gravel mine project known as the Ranch Quarry in unincorporated Whatcom County, Washington. This report describes existing conditions, analyzes proposed impacts, and as needed presents mitigating actions based on the current design that will maintain, protect and/or enhance existing critical areas and associated buffers in accordance with applicable environmental regulations.

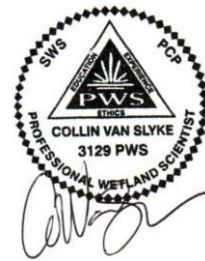
This report is intended for inclusion with future development permit submissions to Whatcom County (County), the U.S. Army Corps of Engineers (Corps), Washington State Department of Ecology (WDOE), and the Washington Department of Fish and Wildlife (WDFW) as may be required.

Project Applicant

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1.2 Project Location

The proposed Ranch Quarry site is approximately 80 acres and encompasses portions of five parcels (400518 466281, 400518 488379, 400518 479443, 400517 049475, 400517 18447,) located north of South Pass Road, in unincorporated Whatcom County, Washington (Sections 17 & 18, Township 40N, Range 05E W.M.) (Figure 1). The quarry is to be accessed from South Pass Road via an existing logging road extending through parcels 400517 220470 and 400517 200503.

An aerial photograph of the project area and surrounding landscape is included as Figure 2. The zoning designations for the properties are Rural R10A (400517 049475 & 400517 18447) and Rural Forestry (400518 466281, 400518 488379, 400518 479443). All of the parcels are located within a Mineral Resource Lands (MLR) Special District.

The project site is located within the Saar Creek sub-watershed of the Sumas River watershed within Fraser River basin.

1.3 Project Overview & Background

The proposed project includes the establishment and operation of a new gravel surface mine known as the Ranch Quarry. In addition to the mining operations, rock sorting and crushing activities will occur on site. There will be approximately three employees on site during mine operation. Approximately 25 trucks with mined material will be entering and exiting the site per day.

Access will be from South Pass Road via an existing logging road along the eastern extent of the mine. The gravel road has been in existence for decades and undergone improvements under various FPAs. Most recently, this road was used under FP-2817018. This road will be extended 400 feet to the north to access the northeastern corner of the mine. A weigh scale and scale house will be located at the junction of the new and existing road. No other improvements are proposed for the mine site. No water or sewage disposal facilities are necessary or proposed.

The expected life of the mine is approximately 30 years. A separate reclamation plan will be provided. The mine is to be managed in three phases, all of which are included in this evaluation (Figure 4). The mining plan establishes seven basins, each with a designated stormwater detention pond, intended to retain pre-existing contributing basins and hydrology to wetlands and streams around the periphery of the mine.

NES prepared a critical areas report for the project area and surrounding 300 feet. Seven wetlands and five non-fish bearing, seasonal streams were identified. The following report describes the anticipated project effects on adjacent wetlands and habitat conservation areas. This report also outlines recommended compensatory mitigation measures to be employed in order to offset project impacts and retain watershed functions.

A separate Mitigation Plan detailing installation specifications, performance standards, and maintenance recommendations will be produced after Conditional Use approval for the project has been obtained.

2.0 BASELINE INFORMATION

The project area was reviewed by NES for critical areas from 2020 through 2022. The following is a summary of project's critical areas report (NES, 2022).

2.1 Existing Conditions

The review area includes a collection of parcels, most of which have been logged at various times over the past 50 years. A network of logging roads and trails extend throughout the forested project area. In the central portion of the site, two cleared areas exist: a small exploratory rock pit and a landing used for log splitting. In the southwestern portion of the site are residences, outbuildings, a horse pasture, and a man-made pond used for swimming and recreation. Adjacent land uses include active forestry lands and single-family homes on forested acreage.

Site topography is defined by two large hills located in the eastern and western portions of the property. The hills rise abruptly, roughly 180 feet above the surrounding area. The majority of the project area is characterized by upland conifer forest with tree stands ranging from approximately 10 to 50 years old. Canopy forming trees consist primarily of Douglas fir (*Pseudotsuga menziesii*) with lesser amounts of western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), big leaf maple (*Acer macrophyllum*), bitter cherry (*Prunus emarginata*), and red alder (*Alnus rubra*).

The project area is located within the Saar Creek watershed and includes multiple smaller drainage basins which drain towards various unnamed tributaries of Saar Creek. Critical areas within the vicinity include wetlands, a pond, and streams, as described below (Figure 6).

2.2 Wetlands

NES identified seven wetlands (Wetlands A, C, F, K, L, N and Q) within the project area vicinity (Figure 3). Table 1 provides a classification summary for the identified wetlands. For additional detail refer to the 2022 NES critical area report.

Table 1. Wetland Classification Summary

Wetland	Hydrogeomorphic Class	Cowardin Classification	Approximate Size (ac)
Wetland A	Slope	PFO	0.42
Wetland C	Depressional/ Slope	PFO/PSS	3.96
Wetland F	Depressional- outflow	PFO	0.37
Wetland K	Depressional- outflow	PFO	2.91
Wetland L	Slope	PFO	0.04
Wetland N	Depressional-closed	PFO/PEM	0.05
Wetland Q	Riverine	PFO	0.03

PEM: Palustrine Emergent; PSS: Palustrine Scrub-Shrub; PFO: Palustrine Forested

NES rated site wetlands using the Ecology Wetland Rating System, 2014 Update and Table 2 summarizes the results.

Table 2. Wetland Functional Assessment Summary

Wetland	Improving Water Quality	Hydrologic	Habitat	Total Score	Ecology Category
Wetland A	L/L/M (4)	M/L/M (5)	L/H/H (7)	16	III
Wetland C	M/M/M (6)	M/L/M (5)	M/H/H (8)	19	III
Wetland F	M/L/M (5)	L/L/M (4)	L/H/H (7)	16	III
Wetland K	M/L/M (5)	M/L/M (5)	M/H/H (8)	18	III
Wetland L	L/L/M (4)	L/L/M (4)	L/H/H (7)	15	IV
Wetland N	M/L/M (5)	M/L/M (5)	M/H/H (8)	18	III
Wetland Q	M/M/L (5)	M/M/M (6)	M/H/H (8)	19	III

H: High; M: Medium, L: Low; (Total Score)

2.3 Habitat Conservation Areas (HCAs)

The project area contains one man-made pond and multiple seasonal, non-fish bearing streams (Figure 3).

Streams

Five small seasonal streams (B, D, J, P, and R) were observed within 300 feet of the proposed mine site. Most of the drainages have experienced some degree of manipulation (ditching and/or culverting), from past logging activities. Bed substrate for all site streams is silt. In general, the channels were approximately two to three feet wide and less than one foot deep. With the exception of Stream D which had six inches of water, all of the observed streams contained less than three inches of water during the winter site visits. The review area is a local topographic high point, and the site streams flow in various directions down the hillslopes, but all eventually flow into Saar Creek.

The upstream extent of fish habitat is indicated in Figure 3. The nearest fish habitat is within Stream B, at the outlet of Wetland A. This reach is mapped by WDFW to be gradient accessible to coho (*Oncorhynchus kisutch*), bull trout (*Salvelinus confluentus*), resident coastal cutthroat (*O. clarki clarki*), and steelhead (*O. mykiss*). Bull trout and steelhead are federally-listed Threatened species. Bull trout are also a state-listed Candidate species.

Pond

A 1.38-acre man-made pond exists in a topographic low point at the foot of the hill in the southwest portion of the proposed mine. No wetlands are associated with the pond fringe. The edge of the pond is comprised of large boulders and the water depth drops off rapidly from shore. The pond is at least ten feet deep with clear water and a rocky bottom. No fish or wildlife were observed in the pond during the numerous site visits. It may occasionally be utilized by waterfowl for temporary refuge, though no vegetation or food sources exist within the pond. The pond shoreline is steep, comprised of rocks and boulders, and lacks fringe habitat.

A floating dock and recreational equipment are located at the western end of the pond. An overflow pipe is located at this end which appears to direct water approximately one quarter mile to the southwest during high water events. As supported by the Corps Jurisdictional Determination, this conveyance is an artificially created overflow pipe associated with the pond, not a natural watercourse. The pipe daylights approximately 830 feet southwest of the pond and water is conveyed via a series of ditches. The ditched water converges with a seasonal stream forming from the outlet of a second pond to the southwest. Water flows south into a smaller man-made pond with a flow control outlet. Water continues south into a wetland system along either side of South Pass Road. This wetland system, located approximately one quarter mile south of the project area, is also fed by Stream D (Figure 6).

Wildlife

No WDFW Priority species or habitats are mapped or were identified within 300 feet of the project area.

The site has been managed for forestry over the past 50+ years. As a result, the stands throughout the site are relatively uniform and lack features (Priority logs and snags). However, the position in the landscape and condition of the forestry regrowth creates potential habitat for a variety of wildlife. While none were observed during the site visits throughout 2020-2022, species which could potentially utilize or migrate through the site include black bear (*Ursus americanus*), cougar (*Puma concolor*), bobcat (*Lynx rufus*), black tailed deer (*Odocoileus hemionus columbianus*), coyote (*Canis latrans*), squirrels and other small mammals, raptors, and songbirds.

2.4 Regulatory Summary

Agencies with regulatory authority over site wetlands, streams, and fish and wildlife habitat conservation areas are summarized in Table 3.

Table 3. Critical Areas Summary

Feature	Category/ Stream Type	Regulatory Authority				Regulated Buffer (ft)
		County	Corps	Ecology	WDFW	
Wetland A	III	X	X	X	X	150
Stream B	Ns/F*	X	X	X	X	50/100*
Wetland C	III	X	X	X	X	150
Stream D	Ns	X	X	X	X	50
Wetland F	III	X		X		150
Stream J	Ns	X	X	X	X	50
Wetland K	III	X	X	X	X	150
Wetland L	IV	X		X		50
Wetland N	III	X		X		150
Stream P	Ns	X	X	X	X	50
Wetland Q	III	X	X	X	X	150
Stream R	Ns	X	X	X	X	50
Pond	N/A	X				N/A

Ns= Non-fish bearing, seasonal; F- Fish bearing
 * Stream B is Ns upstream from the culvert inlet.

2.4.1 Local- Whatcom County CAO

All site wetlands, streams, and the pond appear to be regulated under the County CAO.

Whatcom County requires a buffer around regulated critical areas to protect functions. The buffer must remain naturally vegetated except where it can be enhanced to improve the functions. Wetland buffers are measured from the wetland edge. Standard wetland buffer widths are determined according to proposed or existing land use intensity, the overall wetland category, and the habitat rating. The proposed mineral resource extraction activity is likely to be considered a high-intensity land use. The anticipated wetland buffer sizes are detailed in Table 3.

All site streams are non-fish bearing and therefore require 50-foot buffers. Downstream of Wetland A, Stream B requires a 100-ft buffer.

Whatcom County regulates man-made ponds created prior to 2005 as HCAs. Ponds do not require a buffer.

2.4.2 State and Federal

Activities altering wetlands, streams, and other regulated water bodies may require permit authorization from the Corps under Section 404 of the federal Clean Water Act (CWA) (33 U.S.C. § 1251 et seq.) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 401). The Corps appears to have jurisdiction over wetlands and streams as stated above in Table 3. An Approved Jurisdictional Determination (ADJ) was issued in 2021 documenting the pond is not a regulated Water of the United States (WOTUS).

Ecology has authority over discharge into all wetlands (including isolated wetlands) and streams and can impose buffers and compensatory mitigation for impacts. Ecology reviews all permits received by the Corps for 401 Water Quality Certification. Ecology requires an “individual” review of all wetland disturbances greater than one-half acre or those that require additional review. Water Quality Certification is required for all Individual Permit applications.

The WDFW requires issuance of a Hydraulic Project Approval (HPA) prior to any activities that may affect streams or associated wetlands.

Only the aforementioned agencies have the authority to make jurisdictional determinations. **However, the project avoids all wetlands and streams. Therefore, no HPA or CWA Section 404/401 permitting is required for the proposed project.**

3.0 IMPACT ASSESSMENT

3.1 Mitigation Sequencing

The Whatcom County CAO requires projects demonstrate adherence to a specific sequence of actions termed “mitigation sequencing” before impacting regulated critical areas (WCC 16.16.260). The proposed project applied mitigation sequencing as summarized below:

- **Avoid.** The project avoids direct wetland and streams impacts.
- **Minimize.** The property has been managed as natural resource land for many years. The current proposal continues this use but pivots from forestry to mineral extraction. The existing forest road will be used. Use and extension of this existing road minimizes vegetation removal, reduces land disturbance, and avoids additional stream crossings which would be necessary for a new road.

The overall plan and mine extent has undergone multiple revisions over the course of 2020 through 2022, and the scope has been reduced and modified in order to avoid direct wetland and stream impacts and reduced indirect impacts to the greatest extent feasible. Initial grading plans included mining within Wetlands C, K, L, N, and Q and Stream B. The plan was scaled back to avoid direct impacts to the site wetlands and

streams. Subsequent revisions to the plan included a reduction in the depth of excavation (reducing the overall yield of material mined) in order to retain pre-existing contributing basins of each wetland & stream and maintain hydrology during mine operation and after reclamation. This requires stormwater detention ponds to be constructed for each catchment/ contributing basin.

- **Rectify.** Activity at the proposed mine site is anticipated to occur over 30 years. While this is an extended timeframe it is not a permanent change in use. The mine site area will be reclaimed upon project completion and the entire area will then again be managed for forestry.

Further, to minimize temporal loss and indirect wetland impacts, mining activities within the buffers of Wetlands C and K will be limited to one year and then revegetated immediately (rather than only at the time of mine reclamation).

- **Reduce or eliminate through preservation or maintenance.** The project shall comply with stormwater requirements and shall adhere to BMPs during resurfacing.

During the operation of the mine, hydrology to adjacent wetlands and streams will be retained by preserving the contributing basins. The mining plan establishes seven separate catchments to direct water to stormwater detention ponds which outlet towards the adjacent wetlands. These catchments will be maintained after reclamation to ensure the wetlands retain their pre-mining hydrologic inputs.

- **Compensate.** Recommendations for mitigating actions to offset impacts to critical area functions are included in Section 4.0.

3.2 Proposed Critical Areas Impacts

Table 4 details the critical area impacts associated with the proposed quarry.

Table 4. Proposed Critical Area Impacts

Feature	Impact Type*	Impact Acreage
Wetland C (Cat. III)	Permanent Buffer Impact	0.487
	Long-Term Temporary Buffer Impact	1.531
Wetland K (Cat. III)	Permanent Buffer Impact	0.267
	Long-Term Temporary Buffer Impact	0.450
Wetland L (Cat. IV)	Indirect Wetland Impact	0.014
Wetland N (Cat. III)	Indirect Wetland Impact	0.045
Wetland Q (Cat. III)	Indirect Wetland Impact	0.026
Stream B (Ns)	Permanent Buffer Impact	0.060
Stream P (Ns)	Permanent Buffer Impact	0.189
Pond	Direct Impact	1.38

3.2.1 Wetland Impacts

No direct wetland impacts are proposed.

3.2.2 Indirect Wetland Impacts

Clearing and mining activity is proposed up to the edge of Wetlands C, K, L, N, and Q. Work occurring adjacent to wetlands has the potential to indirectly impact wetland functions. While still retaining wetland characteristics, functions within this portion of the wetlands are reduced as they now lack a buffer entirely. Due to the prolonged timeline of mine operation prior to reclamation, several of these indirect impacts are to be considered permanent in nature (Ecology, 2021).

Indirect impact areas are calculated by the acreage of wetland within a defined distance of the activity. The distance is defined by the wetland buffer width (Table 3). **A total of 0.085 ac of permanent indirect wetland impact** associated with Wetlands L, N, and Q and anticipated. Impacts associated with work occurring adjacent to Wetlands C and K are described below.

3.2.3 Wetland Buffer Impacts

In order to minimize the effects of temporal loss, the mining plan limits activity within the inner 75 percent of the buffers of Wetland C and K (the two largest and higher functioning wetlands) to one year of temporary disturbance. However, because it will take longer than two years for the forest vegetation to return to its pre-mined condition, these are considered long-term

temporary impacts requiring compensatory mitigation (Ecology, 2021). A **total of 1.981 ac of long-term temporary buffer impact** associated with Wetlands C and K are anticipated.

Stormwater ponds will be situated in the outer 25 percent of the buffers of Wetland C and K, necessary in order to direct positive flow. The stormwater ponds will remain for the life of the mine (~30 years). Therefore, these have been considered **permanent buffer impacts (0.754 ac total)**.

3.2.4 Stream Impacts

No direct stream impact or work below the OHWM of a stream is proposed.

3.2.5 Stream Buffer Impacts

Stormwater detention ponds will be constructed in the buffers of Streams A and P. These ponds will remain throughout the 30-year operation of the mine and are considered permanent in nature. A total of **0.249 ac of permanent stream buffer impact** is anticipated.

3.2.6 Pond Impacts

The 1.38-ac man-made pond overlaps with the mining extent and will be eliminated. The grading for the mine will result in an excavated bench that is 200-feet deeper than the ground elevation at the current pond location.

3.3 Impact Analysis

The proposed mine has the potential to indirectly impact wetland, stream, and/or buffer functions due to the proximity of the activity and temporal loss associated with reclamation and revegetation. The following sections provide an analysis of the potential functional impacts associated with the project.

3.3.1 Water Quality/Run-off Filtration

Existing Condition:

The project area is the local topographic high point comprises the headwaters of the wetlands and streams identified herein. Considering its position in the landscape and forested condition, water currently entering the wetlands and streams is clean, cold, and free of impairments.

Wetlands: The site wetlands have low to moderate potential to perform water quality improvement functions. The site wetlands are forested and contain vegetation capable of providing water filtration and uptake of pollutants. However, in the current condition of the site, the wetlands lack opportunity to perform water quality improvement functions due to the absence of pollutant inputs from the surrounding forested areas. The wetlands are situated in a forested environment with little to no development nearby. Therefore the site wetlands currently provides negligible water quality improvement functions.

Pond: In general, ponds are capable of providing water quality improvement functions by allowing particulates to settle. The site pond lacks vegetation capable of pollutant uptake and conversion. Similar to the site wetlands, water quality function provided by the site pond is

limited by the lack of sediment and pollutant input. The uphill surroundings are forested. Therefore the pond currently provides negligible water quality improvement functions.

Streams: No water quality impairments exist within the on-site or adjacent stream reaches. Saar Creek is not documented to have impairments, but it flows into the Sumas River approximately ten miles downstream from the project area. The Sumas River is a 303(d)-listed water with fecal coliform, dissolved oxygen, and temperature impairments. The Sumas River watershed has a multiparameter TMDL for BOD, ammonia-N, and Chlorine. These impairments are the product of the agriculture-dominated landscape at the foot of Sumas Mountain. Aside from runoff from the existing logging roads which sprawl through the site, no development exists on site which would contribute polluted runoff into the site streams.

Potential Impact:

Wetlands: As described above, the site wetlands and pond currently do not provide water quality improvement functions because currently there is no source of pollutants. Therefore, directly or indirectly impacting these features would not reduce this function within the watershed.

However, mining presents water quality concerns by way of ground disturbance which can result in sediment loading. Additionally machinery and trucks have the potential to be a source of pollutants if not properly maintained. Eliminating buffer vegetation increases the potential for sediment and pollutants to enter surface waters.

Buffer vegetation also provides shading and thermal protection of water within wetlands and streams. Removal of buffer vegetation has the potential to increase stream temperatures which affects temperature and dissolved oxygen, which degrades fish habitat quality. However the nearest fish habitat (Stream B) maintains a minimum of 320 linear feet of forest between the clearing limits

Streams: Same as above.

Pond: Same as above.

Mitigated Determination & Recommendations:

The stormwater plan will address stormwater management in accordance with the Washington State Department of Natural Resources (DNR) and Ecology's Sand and Gravel General Permit. The project establishes seven stormwater detention ponds around the periphery of the mine to meet applicable stormwater regulations. Stormwater runoff will be directed to the ponds for detention, allowing particulates to settle. The clean water will outlet towards the adjacent wetlands to maintain hydrologic inputs. The project meets stormwater regulations, therefore no reduction in water quality is anticipated.

To further enhance water quality improvement functions provided by the retained buffers, we recommend buffer enhancement plantings along the lower reaches of Stream B, north of the access road. This reach of Stream B lacks trees and shrubs along the eastern bank and is adjacent to a residence and parking area. Buffer enhancement here serves to increase water quality protecting by providing shade, organic inputs, and runoff filtration.

Machinery should be maintained in good working condition such that petroleum products or other chemicals are not leaked into adjacent critical areas.

3.3.2 Hydrology

Existing Condition:

The downstream waters of the Sumas River have flooding issues, therefore the hydrologic functions provided by wetlands within the watershed are of value.

The site wetlands have low to moderate potential to perform hydrologic functions. Many of the wetlands are slope wetlands or flow-through depressional wetlands where ponding/ flood retention potential is minimal. Storage capacity within Wetlands C and K is higher due to the larger size and topography (depressions), resulting in a greater potential for water storage. As stated above, the wetlands and the pond are situated in a forested environment and do not currently receive excess surface water input.

The pond is sizable (1.38 ac), several feet deep, and capable of notable water storage. The pond draws down several feet during the summer and refills over the fall months. However the maximum depth is limited by an overflow pipe at the south end. Once refilled, there is little to no live storage of water during the wet season. Therefore, the pond appears to provide little flood reduction once hydrology has recharged in the fall/winter. Rather, the pond, overflow pipe, and downstream ditches primarily function as a conveyance of runoff to wetlands and streams downstream.

Site consists of four primary drainage basins (Figure 6) (Canyon, 2022):

- DB-1 drains toward the pond and Wetland C
- DB-2 drains towards Wetland A and Stream B
- DB-3 drains towards Wetlands K, L, N, Q and Stream P
- DB-4 drains towards Streams J and R

Potential Impact:

The mining plan divides the four drainage basins site into seven catchments in order to maintain hydrology to Wetlands A, C, F, K, L, N, and Q (all site wetlands) by retaining their pre-existing contributing basins (± 15 percent). A threshold of ± 15 percent is consistent with the acceptable range of wetland hydroperiod protection defined by Minimum Requirement #8 of the 2019 Stormwater Management Manual for Western Washington (Ecology, 2019). DB-3 has been subdivided into four catchments to maintain the individual wetlands' contributing basins.

As detailed in Figure 6, DB-1 (which currently feeds the pond) will be redirected to drain north into DB-5 (which feeds Streams J and R via the westernmost detention pond). This redirection of 16.961 acres will increase DB-4 by 19.7 percent. The effect of this on the downstream receiving waters (Streams J and R) is anticipated to be minimal because the runoff from the mine will be detained by the stormwater pond and then dispersed into the upland forest for infiltration.

This redirection has the potential to alter the hydroperiod of the wetland system along South Pass Road, downstream from the existing pond (Figure 6). Again, the effects of this are anticipated to be minimal. The wetlands along South Pass Road are very large and have a

contributing basin of 300 acres (DB 1). The redirection of 19.961 acres is a reduction of 6.8 percent, well below the ±15 percent range.

Mitigated Determination & Recommendations:

For the reasons detailed above, no significant impacts to site hydrology are anticipated. The project has been designed to implement grading and stormwater elements to ensure adequate hydrology to downstream wetlands and streams are retained.

3.3.3 Fish and Wildlife Habitat

Existing Condition:

Wetland habitat: The site wetlands have moderate to high potential to provide habitat functions. Many of the wetlands contain habitat features such as large woody debris and several are located near or are directly connected to headwater drainages, which increases habitat interspersion.

Streams: The upstream extent of fish habitat is indicated in Figure 3. The nearest fish habitat is within Stream B, at the outlet of Wetland A. This reach is mapped by WDFW to be gradient accessible to coho (*Oncorhynchus kisutch*), bull trout (*Salvelinus confluentus*), resident coastal cutthroat (*O. clarki clarki*), and steelhead (*O. mykiss*).

Pond: Habitat quality provided by the pond is very minimal. The man-made pond is developed with recreational equipment including a floating dock, water slide, diving board, rope swing, and picnic area. The banks are steep, rocky, and unvegetated, lack fringe habitat for wildlife which would typically occupy pond edges (waterfowl, rodents, beavers, etc.). The pond has the potential to provide temporary refuge for migrating waterfowl, however it lacks aquatic food sources as the bed is rocky and unvegetated. No fish are present within the pond. No wildlife was observed during the numerous site visits from 2020 to 2022. Therefore, wildlife use of the pond is anticipated to be minimal.

ESA Listed Species: As documented in the critical areas report, with the exception of potentially bull trout and steelhead, no listed species [including gray wolf (*Canis lupus*), Marbled Murrelet (*Brachyramphus marmoratus*), Streaked Horned Lark (*Eremophila alpestris strigata*), Yellow-billed Cuckoo (*Cuckoo Cocyzyus americanus*)] inhabit the project area and no Critical Habitats are present.

Potential Impact:

Wetland Habitat: No disturbance will occur within the wetlands themselves, however reduction of the buffers reduces screening between the mine and wildlife which may be utilizing the wetland habitat. Therefore the habitat functions within the adjacent portions of Wetlands L, N, and Q are anticipated to be indirectly impacted.

Additionally, while the buffers of Wetlands C and K are scheduled to be replanted within two years of the initial disturbance and mining activity, it will take longer for the trees to regrow to their current size. Therefore, there is a long-term temporary impact associated with this temporal loss in buffer vegetation function.

Wildlife within the adjacent portions of the wetlands may be impacted by the noise of rock crushing and machinery as well as traffic from trucks driving along the haul road which extends through portions of Wetland A and Stream B. However the road is a legally active forestry road. Therefore habitat functions within Wetland A and Stream B are already impacted to a degree.

There will be stormwater ponds adjacent to each wetland. While not providing the same level of protection as forested buffer, the ponds provide physical separation between the wetlands and the higher intensity mining activities located centrally within the site, reducing the indirect wetland impact.

Streams: No work will occur below the OHWM of any site streams, therefore no direct impacts to stream habitat will result. The project involves clearing and grading within the buffers of Streams B and P. This has the potential to reduce stream habitat quality indirectly through water quality and shading. These impacts have been described above.

Pond: While the pond appears to provide minimal habitat function, elimination of open water habitat within the landscape has the potential to reduce refuge opportunities for migrating waterfowl.

ESA Listed Species: Potential effects on bull trout and steelhead are addressed in the stream habitat section above. No other listed species occupy the project area, so no impacts to these species are anticipated.

Mitigated Determination:

The project indirectly impacts wildlife habitat function within the site wetlands, buffers, and pond. On-site and Off-site compensatory mitigation measures are recommended below in Section 4.0 to replace these functions and ensure no net loss of fish and wildlife habitat function occurs within the landscape.

3.3.4 Cumulative Impacts

Existing Condition:

The site is within a fairly rural area within Whatcom County along the north side of Sumas Mountain. Overall, development in the vicinity of the site is generally minimal and includes single family homes on forested acreage. However much of the land on Sumas Mountain is in forestry and/or is managed by the DNR.

Potential Impact:

One of the primary concerns of cumulative impacts to forested habitat is fragmentation. Intrusion into larger forested blocks has the potential to sever migratory corridors for wildlife. Like many of the remaining forested blocks in lower Whatcom County, this area is susceptible, and is likely already experiencing some level of cumulative impacts resulting from habitat fragmentation from the sum of multiple individual development projects.

The proposed mine does not contribute to further habitat fragmentation, as it has been managed for natural resource extraction (forestry) for decades and will be returned to forestry after

reclamation. Existing logging roads sprawl throughout the site providing access to the various stands which have been logged throughout the past fifty years.

Water quality in downstream water resources is also susceptible to cumulative impacts due to the sum of multiple projects built in a watershed. As previously mentioned, the project will comply with water quality standards for the DNR and Ecology Sand and Gravel General Permit.

Cumulative impacts analysis also includes addressing items that could reasonably occur in the foreseeable future as a result of the proposed project. These are referred to as interrelated or interdependent actions/ impacts. An example of this is when new roads are built or when new lots are created, additional impact would likely occur due to construction of homes or businesses along new roadway or impacts for homes installed on newly platted lots. The mine site will be reclaimed and returned to forestry, not intended for subdivision or residential use. No additional interrelated actions are anticipated due to the proposed project.

Mitigated Determination:

No additional impacts were identified that will result from cumulative impacts associated with this project.

3.3.5 Impact Summary

Overall the project has been designed to avoid and minimize impacts to critical areas by implementing the measures detailed in Mitigation Sequencing above (Section 3.1). **No significant impacts to critical area water quality functions, hydrology, and ESA-listed species are anticipated. However, due to the temporary loss of forested acreage and anthropogenic disturbance associated with the operation of the mine, wildlife habitat functions within site wetlands and the pond are anticipated to be indirectly (wetlands) or directly (pond) impacted.**

4.0 MITIGATION RECOMMENDATIONS

To comply with the Whatcom County Critical Areas Ordinance (CAO) and ensure no net loss of critical area function, the project will include compensatory mitigation for the impacted critical area functions identified above. A summary of the proposed mitigation is provided in Table 5 and described below.

Table 5. Summary of Proposed Mitigation

Impact	Impact Acreage	Compensation Ratio	Mitigation Recommended (acres)
Indirect Wetland Impact (Cat. III)	0.071	8:1 (x0.5) E ³	0.284 WE
Indirect Wetland Impact (Cat. IV)	0.014	6:1 (x0.5) WE ³	0.042 WE
Permanent Wetland Buffer Impact	0.754	1:1 BE ¹	0.754 BE
Long-Term Temporary Wetland Buffer Impact	1.981	1:1 BR + 0.25:1 BE ^{1,3}	1.981 BR + 0.495 BE
Permanent Stream Buffer Impact	0.249	1:1 SE ²	0.249 SE
Direct Pond Impact	1.38	n/a	Pond habitat enhancement-see below

1- per WCC 16.16.680(c); 2- per WCC 16.16.760(B)(8)(b); 3- per Ecology, 2021

WE= Wetland Enhancement; BE= Wetland Buffer Enhancement; BR= Wetland Buffer Restoration; SE= Stream Buffer Enhancement

The compensation ratios for wetland and stream buffer impacts detailed in Table 5 are prescribed by Whatcom County Code 16.16.680(c) and 16.16.760(B)(8)(b). Ecology’s Wetland Mitigation Guidance specifies how indirect wetland impacts and long- term temporary impacts are compensated (Ecology, 2021). The Country appears to be the only regulating agency for the pond, however no defined compensation ratio exists. Therefore, for the pond, the recommended compensation is based on functional replacement rather than an acreage ratio.

As described in the Impact Assessment section above, the primary function impacted by loss of the pond is potential refuge for migrating waterfowl. We propose replacing this function by enhancing waterfowl habitat and refuge within the Sumas Mountain area- further detail is provided below. **By implementing the mitigation measures detailed in Table 5, the project is expected to have no net loss of critical area function.**

4.1 Mitigation Site & Strategy

The following outlines the conceptual mitigation plan. A separate document detailing installation specifications, performance standards, and maintenance recommendations will be produced after Conditional Use approval for the project has been obtained.

Wetland buffer restoration and stream buffer enhancement is able to be conducted on site (Figure 7). In order to mitigate stream habitat impacts, we recommend buffer enhancement plantings along the lower reaches of Stream B, north of the access road. This fish-bearing reach of Stream B lacks trees and shrubs along the eastern bank and is adjacent to a residence and

parking area. Buffer enhancement here serves to indirectly enhance fish habitat quality by providing shade, organic inputs, and runoff filtration.

The site lacks mitigation opportunities to offset the indirect wetland and pond impacts. Therefore, an off-site mitigation area has been identified to fulfill the mitigation needs. The offsite mitigation area is located along Hoff Road (parcels 390422252123 and 390422434010) is approximately eight miles south of the Ranch Quarry, along the southwester toe of Sumas Mountain. NES prepared a critical areas assessment for the site in 2022 (NES, 2022b).

The Hoff Road site is currently actively farmed with row crops and recreationally used for seasonal waterfowl hunting. The southern portion of the site contains two streams, two ponds, and farmed wetlands. Further, the site is located within a Special Flood Hazard Area (SFHA) associated with Smith Creek and is connected to the project site via the large, forested corridor extending over Sumas Mountain.

4.1.1 Site Selection Rationale

The impact site is within the Saar Creek sub-basin of the Sumas River watershed. The mitigation site is within the Smith Creek sub-basin of the Nooksack River watershed. The proposed mitigation site was chosen because it was available, while no suitable sites were found in the Sumas River basin. The mitigation site also was found to be a suitable site to offset impacts associated with the project site based on criteria in the Ecology publication *Selecting Mitigation Sites Using a Watershed Approach* (Ecology 2009) (Appendix C).

Furthermore, the Hoff Road site contains similar critical areas as the Ranch Quarry (wetlands, streams, ponds) and is connected to the same wildlife corridor via Sumas Mountain. Wetland and pond wildlife habitat is the primary function expected to be impacted by the mine project. Therefore, the mitigation site was selected with the primary objective to replace wildlife habitat within Sumas Mountain corridor.

4.1.2 Mitigation Strategy

Within the Hoff Road site, two excavated ponds exist within a large wetland system (Wetlands E and F) extending through the site. A fish-bearing tributary of Smith Creek flows through the ponds. Multiple waterfowl species have been observed by NES to utilize the pond, including ducks, geese, and herons. However, with no protective buffer, the wildlife utilizing the ponds experiences disturbances from a railroad, farming, and hunters. The wetlands on site have been farmed for decades with corn. No persistent vegetation exists, and habitat is severely degraded.

Ample functional lift potential exists at the Hoff Road mitigation site to restore degraded wetland, stream, and pond habitat, offsetting impacts associated with the Ranch Quarry. Proposed off-site mitigation measures are depicted in Figure 8. This includes all of the recommended mitigation actions and acreages detailed in Table 5. The habitat function of the ponds will be enhanced by establishing a vegetated protective 110-ft buffer. A 110-ft wide habitat corridor will be established to link the ponds and stream habitat to wetland/buffer enhancement areas and forested acreage on Sumas Mountain.

In combination with the on-site wetland buffer restoration and stream buffer enhancement, the proposed offsite mitigation measures at the Hoff Road site are expected to fully offset all functional impacts to critical areas associated with the Ranch Quarry.

APPENDIX A: REFERENCES

References

- Brinson, M. 1993. *A Hydrogeomorphic Classification for Wetlands*. U.S. Army Corps of Engineers, Washington D.C. Tech. Report WRP-DE-4.
- Canyon Environmental Group. 2022. *Preliminary Aquifer Recharge Area Evaluation: Ranch Quarry*. Bellingham, WA.
- Google Maps. 2022. Available online at [<https://www.google.com/maps/>] accessed December 2022.
- Hruby, T. 2014. *Washington State Wetlands Rating System for Western Washington, 2014 Update*. Washington State Department of Ecology Publication #14-06-029. Olympia, WA.
- Northwest Ecological Services. 2022. *Critical Area Assessment for the Ranch Quarry*. Bellingham, WA [Cited in text as NES, 2022a].
- Northwest Ecological Services. 2022. *Critical Area Assessment for 3839 E Hoff Road, Whatcom County, WA Parcels 390422252123 and 390422434010*. Bellingham, WA [Cited in text as NES, 2022b].
- Washington State Department of Ecology. 2009. *Selecting Wetland Mitigation Sites Using a Watershed Approach*. Washington State Department of Ecology Publication #09-06-032. Olympia, WA. [Cited in text as WDOE, 2009].
- Washington State Department of Ecology. 2019. *Stormwater Management Manual for Western Washington*. Washington State Department of Ecology Publication #19-10-021.
- Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. (2021). *Wetland Mitigation in Washington State—Part 1: Agency Policies and Guidance (Version 2)*. Washington State Department of Ecology Publication #21-06-003
- Washington State Department of Fish and Wildlife Biologist Joel Ingram. Personal Communication: Email from December 8, 2020
- Whatcom County. 2017. Whatcom County Code: Critical Areas Ordinance. Bellingham, WA.

APPENDIX B: FIGURES

**APPENDIX C: SELECTING WETLAND MITIGATION SITES
USING A WATERSHED APPROACH FLOWCHARTS**
