

To: Quinault Indian Nation
Attn: Karen Allston

From: Natural Systems Design and Saturna Watershed Sciences
Tim Abbe, PEG, PHG & Paul Pittman, PEG

Date: April 28, 2022

Re: **Review of Supplemental Quarry Operations Technical Memo related to the proposed FRE facility on the upper Chehalis River**

The Chehalis Flood Control Zone District (Applicant) has submitted supplemental information for the proposed surface mines to support the environmental review for the Flood Retention Only - Expandable (FRE) project. The FRE facility and airport levee improvements are being reviewed under the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA) by the U.S. Army Corps of Engineers (Corps) and the Washington State Department of Ecology (Ecology), respectively. As part of that review process, the Corps and Ecology have requested the Applicant provide additional analyses and supplemental documentation to inform regulatory decision making.

The supplemental information is a technical memorandum titled “Quarry Operations (draft)” by HDR, dated December 17, 2021, herein referenced as the Quarry Operations memo.

Regulatory Requirements and Level of Analysis Required for SEPA Review

The information provided in the Quarry Operations memo does not provide the basic facts to evaluate the impacts of the proposed actions, nor does the level of analysis comply with state guidelines for quarry development.

In Washington State, the Surface Mining Act is a reclamation law that requires a permit for each mine that: (1) results in more than 3 acres of mine-related disturbance, or (2) has a high-wall that is both higher than 30 feet and steeper than 45 degrees (RCW 78.44, chapter 332-18 WAC).

Local governments must formally approve mine sites and/or the subsequent use of the mine site (RCW 78.44.091) prior to receiving a reclamation permit from the state. This approval process generally makes local jurisdictions the lead agency responsible for SEPA review (Per RCW Chapter 43.21C) for the development of a surface mine/quarry. However, in relation to the two quarries proposed to supply material needed to construct the proposed FRE dam in the upper Chehalis River basin, SEPA review is being conducted by the Washington State Department of Ecology.

For SEPA and NEPA environmental review, the EIS needs to evaluate potential impacts to elements of the natural and built environment (see list below) to determine if the proposed action poses significant adverse impacts to the affected elements of the environment that cannot be sufficiently avoided, minimized or mitigated. Analyses sufficient to enable an understanding of the potential impacts of the proposed development of two quarries to supply material to build the proposed FRE facility must be included for decision-makers to determine the potential for significant adverse impacts. Examples of analyses relevant to the development of a new quarry are provided in *italics*.

- Earth (*steep, unstable slopes, erosion, hazards and risks*)
- Air, Noise, and Vibration (*dust, emissions, blasting*)
- Water (*surface and ground water quality, surface water runoff, impacts to streams and wetlands*)
- Plants (*loss of vegetative function, impacts to wetland plant communities, sensitive species, invasive species colonization*)
- Animals (*loss or impacts to habitat, particularly for sensitive species*)
- Energy and Natural Resources (*loss of timber, greenhouse gas analysis*)
- Environmental Health
- Land and Shoreline Use (*compatibility with adjacent land uses and appropriate zoning*)
- Aesthetics (*modifications to viewsheds*)
- Light and Glare (*increase in light and glare in previously undeveloped areas*)
- Recreation (*modification to recreational opportunities due to changes in land use*)
- Historic and Cultural Preservation (*cultural resources analysis*)
- Transportation (*traffic analysis*)
- Public Services (*increased demand for emergency services in previously undeveloped areas*)
- Utilities (*need for power, water, sewer, gas, etc. service to previously undeveloped area*)

During their lifetime, surface mines directly impact landscape topography, vegetation and wildlife communities, air quality, surface and groundwater, and create noise and stormwater runoff thereby having direct and indirect impacts on the environmental elements typically considered in NEPA and SEPA analyses. The persistence and implications of long-term impacts depend on the nature and degree of surface mine remediation. Mines also directly impact areas along the transportation routes which service the mines. In addition to impacts to air quality, greenhouse gas generation, and traffic, the impacts of frequent heavy loads cause significant impacts to roads and road embankments that can directly impact adjacent areas (e.g., streams and wetlands). Given that the primary access route displayed in the Quarry Operations memo lies proximate to the Chehalis River, these are important considerations relative to the scale and intensity of the impacts from development of the proposed FRE facility.

The proposed quarries are surface mines subject to regulation by both Washington State Department of Natural Resources (DNR) and the local jurisdiction (Lewis County). The DNR requires a Reclamation Plan when they conduct SEPA review for surface mines. The specifics of a Reclamation Plan are codified and include providing a site plan that shows all areas of related project activities, boundaries, and detailed plans for how the site will be reclaimed following resource extraction. Additional information is required for mines that may have potentially unstable slopes or are in hydrologically sensitive areas. Surface mines also need to be compliant with the State of Washington Shoreline Management Act, Growth Management Act, and Critical Areas as defined in local ordinance; this includes consideration of impacts to geologically hazardous areas, streams, and wetlands. Based on the NEPA and SEPA EISs and the Quarry Operations memo, the two selected quarry sites are proposed in areas of potentially unstable slopes and are adjacent to, and immediately upgradient of, known salmon bearing streams as described below.

NEW SUPPLEMENTAL INFORMATION: Quarry Operations Technical Memo

The Quarry Operations (draft) technical memorandum was 7 pages of text and included two quarry “Site Plans” as shown below in Figures 1 and 2.

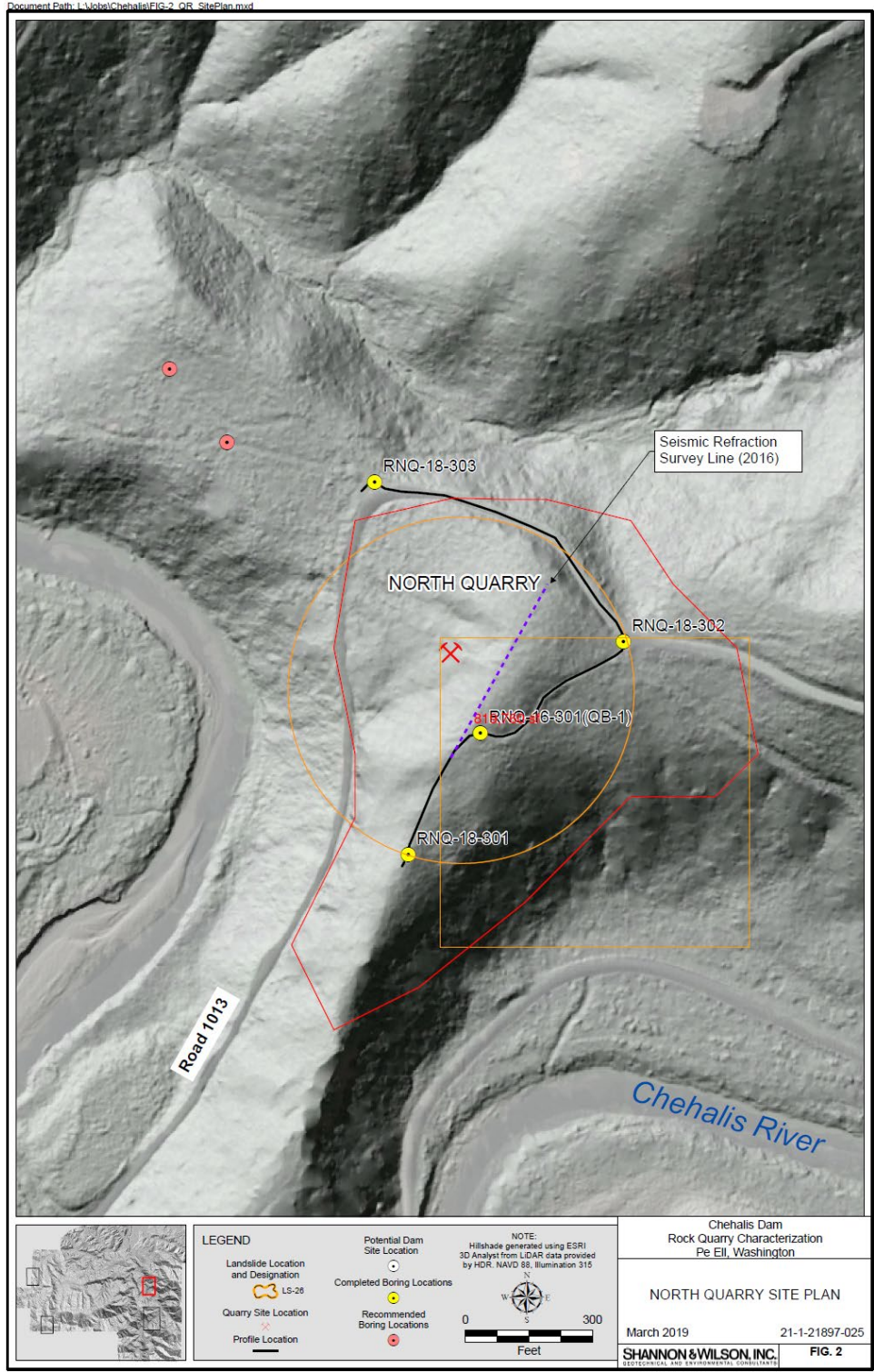


Figure 1. North Quarry Site Plan.

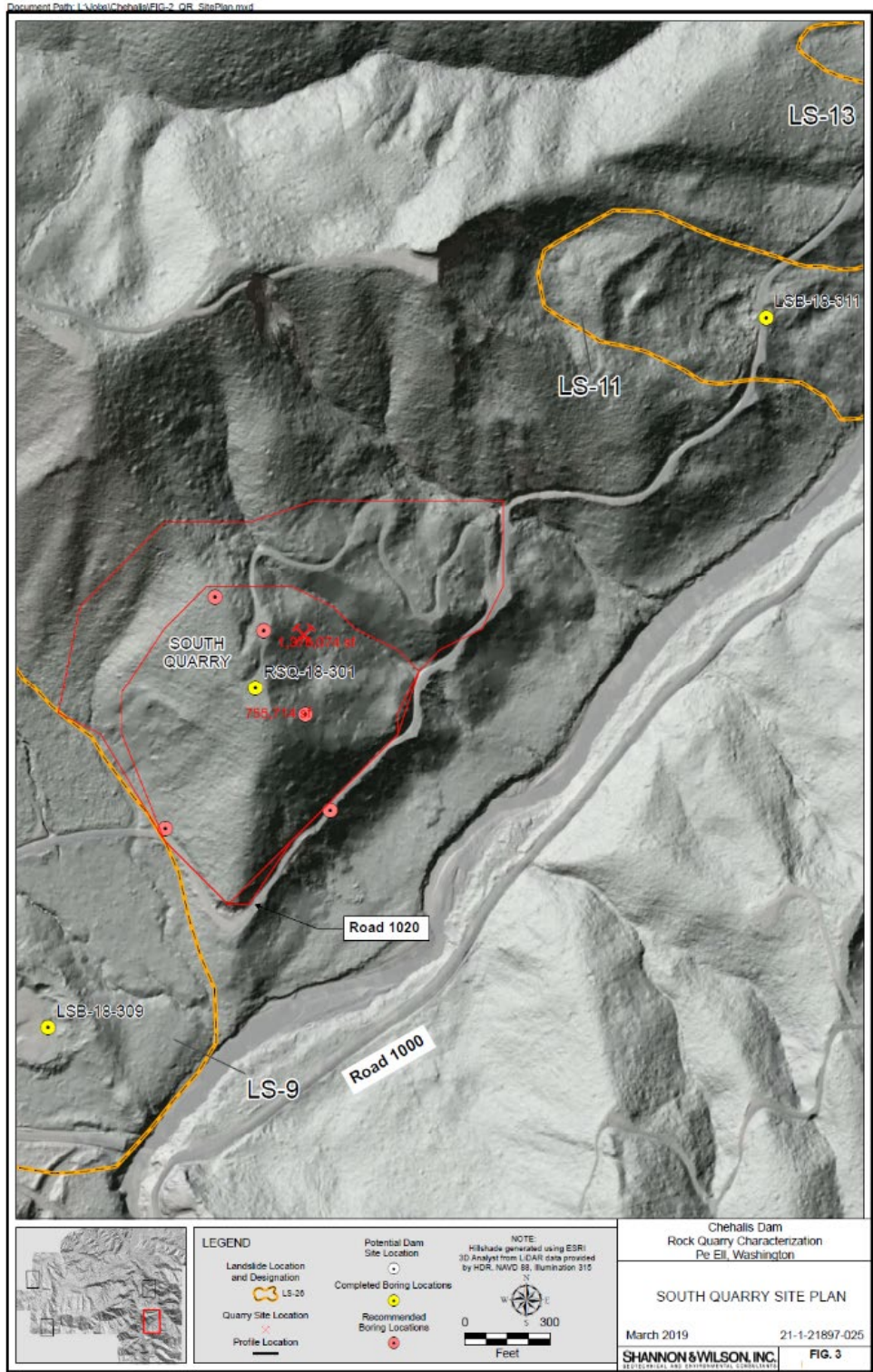


Figure 2. South Quarry Site Plan.

Based on the information provided in the Quarry Operations memo, we understand that:

1. **900,000 cubic yards of material would be needed to build the proposed Flood Retention Only - Expandable (FRE) facility** project (some material would be obtained from off-site, estimated at up to 27,000 cubic yards/50,000 tons of import).
2. **Two quarries** (North Quarry and South Quarry) are now proposed and included in the analysis (three quarries were originally identified in the SEPA and NEPA DEISs).
3. A quantity of aggregate that is two times the volume of the FRE needs is assumed; therefore, the **total aggregate need for development of the proposed FRE facility is approximately 1.8 million cubic yards**.
4. Suitable aggregate and waste rock will have to be transported on proposed access routes which are assumed to follow existing roads (e.g., mainline Road 1000) along the Chehalis River. Road damage is directly related to vehicle ground pressures (weight of vehicle and load divided by surface area of tires on road surface) and the number of trips.
5. The North Quarry is 2.14 road miles from the proposed location of the FRE and approximately 18 acres in size. Waste material is assumed to be 50% overburden and 10% waste rock. Thus, excavation of 1.4 million cubic yards of suitable quarry rock is estimated, and 1.6 million cubic yards of waste with **3 million cubic yards of total excavated material proposed**. Due to the topography of the proposed site, during initial development of the quarry, excavated material (suitable, waste, and overburden) will have to be transported out of the site for stockpiling (overburden and waste) and processing of suitable rock, for example crushing, screening, washing, and loading. Three million cubic yards equates to approximately 300,000 standard 10 cubic yard dump truck trips or a football field-sized area piled 1,800 feet high. Even if large off-road 30 cubic yard dump trucks are utilized, the proposed volume of material would require up to 100,000 trips. It is noted that uncertainty with the geotechnical investigation may require that the quarry footprint expands to meet the material quantity needs; therefore, the actual volumes and related number of haul trips could be higher.
6. The South Quarry is proposed in an existing landslide and area of unstable slopes (NSD 2021, Figures 3 & 4). The mine is 4.3 road miles from the proposed location of the FRE and approximately 17 acres in size. Approximately 2,600,000 cubic yards of suitable rock, with approximately 980,000 cubic yards of overburden and 1,100,000 of waste rock is estimated with a total volume of **4,680,000 cubic yards of total excavated material**. 4.6 million cubic yards equates to approximately 468,000 standard dump truck trips or a football field-sized area piled over half a mile high (2,640 feet). Use of larger 30 cubic yard off-road trucks would still require 156,000 trips to haul the proposed volume. The anticipated headwall for the South Quarry, based on extrapolation from site plans, is over 300 feet tall (taller than the Statue of Liberty; Figure 5).
7. From the equipment list, **we can assume that operation of the quarries will require blasting, crushing, refueling, water use, and several employees** staffing the quarries and hauling material as project related activities. **Washing of aggregate materials** is also referenced.

The following equipment is identified as “typical”

- Multiple large scrapers
- Multiple large bulldozers
- Multiple large front-end loaders
- Multiple large rock dump trucks
- Multiple water trucks
- Support pickup trucks
- Multiple road graders
- Multiple skid steers

- Drilling rigs for blasting
 - Rock crushers
 - Grizzly bars
 - Multiple conveyor belts
 - Fuel trucks
 - Lube trucks
8. The Quarry Operations memo also identifies that the **quarries will be in operation for approximately 5 years**. Overburden removal is estimated at approximately 1 year or less, but there is no information on where the overburden will be stockpiled and how the stockpiles will be managed. It does not seem feasible to store the overburden and waste rock on site initially given the constraints of steep topography. If 10-yard trucks are used for hauling (which is likely the weight threshold for existing roads and bridges), there would be a total of 768,000 one-way loaded trips (~1.5 million total trips); this would equate to approximately **614 loaded trips per day, every working day for 5 years**.
- a. Given the stated quarry footprints and the need to sort and crush rock on-site, the steep confining topography, and the proximity of ecologically sensitive areas (e.g., salmon bearing streams), **it is likely that additional area and/or an offsite area, or areas, will need to be developed to stockpile the large quantities of overburden; an offsite stockpile area (or areas) was not identified.**
9. **The stated quarry footprints are minimum areas.** The memo states that “The estimated area does not consider any designed interior quarry roads and quarry excavation benching distances that are informed by a geotechnical slope stability design.” It should be noted that the stated footprints also do not include temporary stockpile area(s) for placing overburden based on the area and the volumes cited.
10. The memo states that “due to the topography in the area, it is unlikely that the spoil material can be similarly placed to how it was excavated”, but **no indication of how the quarry sites will be reclaimed is presented. There is no plan for where spoil material will be stored, either temporarily or permanently.**
11. Based on the provided site plans, the two proposed quarries are **adjacent to or include WDFW mapped Washington State Priority Habitats & Species (PHS) locations, including salmon bearing waters (Chehalis River) yet no existing conditions data or analysis of impacts is presented in the Quarry Operations memo (nor in the NEPA or SEPA DEISs)**. Priority species mapped in proximity to the proposed locations include Western toad, Dunn’s salamander, resident Coastal Cutthroat, Winter Steelhead, Chinook, Steelhead, Cutthroat, Coho, Rainbow Trout, Fall Chinook, Spring Chinook, Roosevelt elk, Golden eagle, and Northern Spotted Owl (a federally listed threatened species under the U.S. Endangered Species Act).
12. The quarries are proposed in areas of **steep, unstable slopes, and are within a channel migration zone.**
13. The “site plans” presented **do not meet the site plan requirements under the Surface Mine Act and related statutory requirements.** The quarries are integral components of the proposed FRE project, yet **the site plans provide insufficient detail from which to evaluate impacts under NEPA or SEPA.**

Insufficient Information to Support Analysis of Impacts under SEPA and NEPA

Despite the stated purpose of the Quarry Operations memo being to “inform assumptions for quarry operations requirements”, the ‘supplemental information’ provided in the memo relates only to the estimated size of each quarry, the volume of material required from each quarry to build the proposed FRE facility, and the type of equipment anticipated and the duration of operation. No information is presented by which to evaluate impacts related to development of the proposed quarries or the full range of transportation and operations implications. The supplemental information provided in the Quarry Operations memo sheds no light on the nature, scale, or

intensity of potential impacts to the elements of the environment that are required to be analyzed under SEPA and NEPA.

Significant questions remain as a result of the omission of any existing conditions information about the proposed quarry sites and the lack of any disclosure or analysis related to the impacts of the proposed quarries, specifically:

- **What are the specifics of the proposed quarry plans?**
- **What is the extent and nature of waters of the U.S., including wetlands, priority habitats and species, and Endangered Species Act listed or proposed species and critical habitats within the proposed quarry development footprints and associated action areas including transportation routes?**
- **How do the proposed quarry site plans consider potential impacts to elements of the environment (based on the required technical assessments) and how will significant direct and indirect impacts be avoided, reduced, and/or mitigated?**

Without providing basic existing conditions information and site plans that meet the statutory requirements, it is impossible for regulatory decision makers to evaluate the impacts and answer the most basic questions to satisfy the requirements of NEPA and SEPA environmental review, such as:

1. What is the total project footprint to be developed at each quarry?
2. What is the total area of impact, impact duration, and cumulative impacts from all quarry-related project actions, including those that extend beyond the direct quarry development footprint, such as trip routes, other off-site operations and concrete facility, temporary overburden stockpiling, stormwater management, refueling, noise from blasting, storage of blasting materials, water sources, dust control measures, etc.?
3. What elements of the natural and built environment may be directly or indirectly impacted by these associated quarry-related project actions?
4. What will be temporary and long-term changes to topography and drainages?
5. How will existing stream drainages that run through the proposed quarry sites and discharge directly to the Chehalis River be managed?
6. How will surface erosion be managed and water quality be maintained?
7. How will the site be graded and staged, and the steep slopes stabilized? How will quarry headwalls influence mass wasting on adjacent hillslopes? This is particularly critical for the South Quarry which is not only proposed in an existing landslide but is located at the base of a steep slope that will be notably steeper due to quarry (Figures 3 and 4).
8. Are existing roadways suitable for the number of trips (~1.5 million trips), anticipated loads (several bridge crossings), and necessary widths?
9. What will be the air quality and greenhouse gas emissions from the ~1.5 million truck trips associated with development of the quarries?
10. Will the existing roadways and crossings that are below the FRE inundation levels be relocated as part of this project?
11. How and when will the quarry sites be reclaimed (Figure 5)?

- **What are the specifics of the Operation and Management Plan for the proposed quarries?**

The submitted Quarry Operations memo is incomplete. Quarry operations have the potential to have significant impacts; without having specifics of an Operation and Management Plan it is impossible to evaluate the impacts and answer the most basic questions to satisfy NEPA and SEPA environmental review, such as:

1. How will the Operation and Management Plan be compliant with regulatory requirements, including occupational safety?
2. What are the impacts of the Operation and Management Plan actions on elements of the environment (based on the required technical assessments) and how will the impacts be avoided, minimized, and/or mitigated?
3. Are the proposed quarries compliant with adjacent land uses, zoning, and Shoreline Master Program designations? If not, what regulatory processes would be required to make quarries compliant (e.g., Conditional Use, Variance, rezoning)?
 - The Chehalis River is a Shoreline of the State.
 - The lands on which the proposed FRE facility and North and South Quarries are proposed carry a Lewis County Shoreline designation of Rural Conservancy and are zoned as Forest Resources lands, not Mineral Resources Lands.
4. What is the blasting plan and resulting noise and vibration impacts?
5. Where is quarry rock going to be crushed, screened, and sorted?
6. Both quarries are proximate to streams/drainages that discharge directly into the Chehalis River (Figure 5).
 - What is the source of water for washing and how is runoff managed?
 - What is the temporary erosion and sediment control plan?
 - What is the spill pollution prevention plan?
7. How will runoff be addressed and NPDES compliance be achieved?
8. How many truck trips will be generated?
9. What is the dust control plan?
10. What is the road improvement plan to prepare and maintain roads for the proposed heavy traffic so there are no road failures that could directly or indirectly impact the river and adjacent hillslopes?
 - How will the roads be monitored and maintained if FRE facility operation is triggered while the road network is still being used for the quarry development or reclamation?
11. How will the transportation routes be managed and maintained, particularly to prevent mass wasting and runoff into the Chehalis River?
 - The mainline road 1000 seems to be the probable route for both quarries. Much of mainline Road 1000 is adjacent to the Chehalis River and within the associated Rural Conservancy Shoreline zone and likely within the channel migration zone of the Chehalis River. A channel migration zone analysis is part of forestry regulations and the Shoreline Master Program and was not completed as part of the environmental review.

- Portions of the road network are below proposed FRE inundation areas; will these sections roads be relocated for access to the upper watershed once the FRE becomes operational?

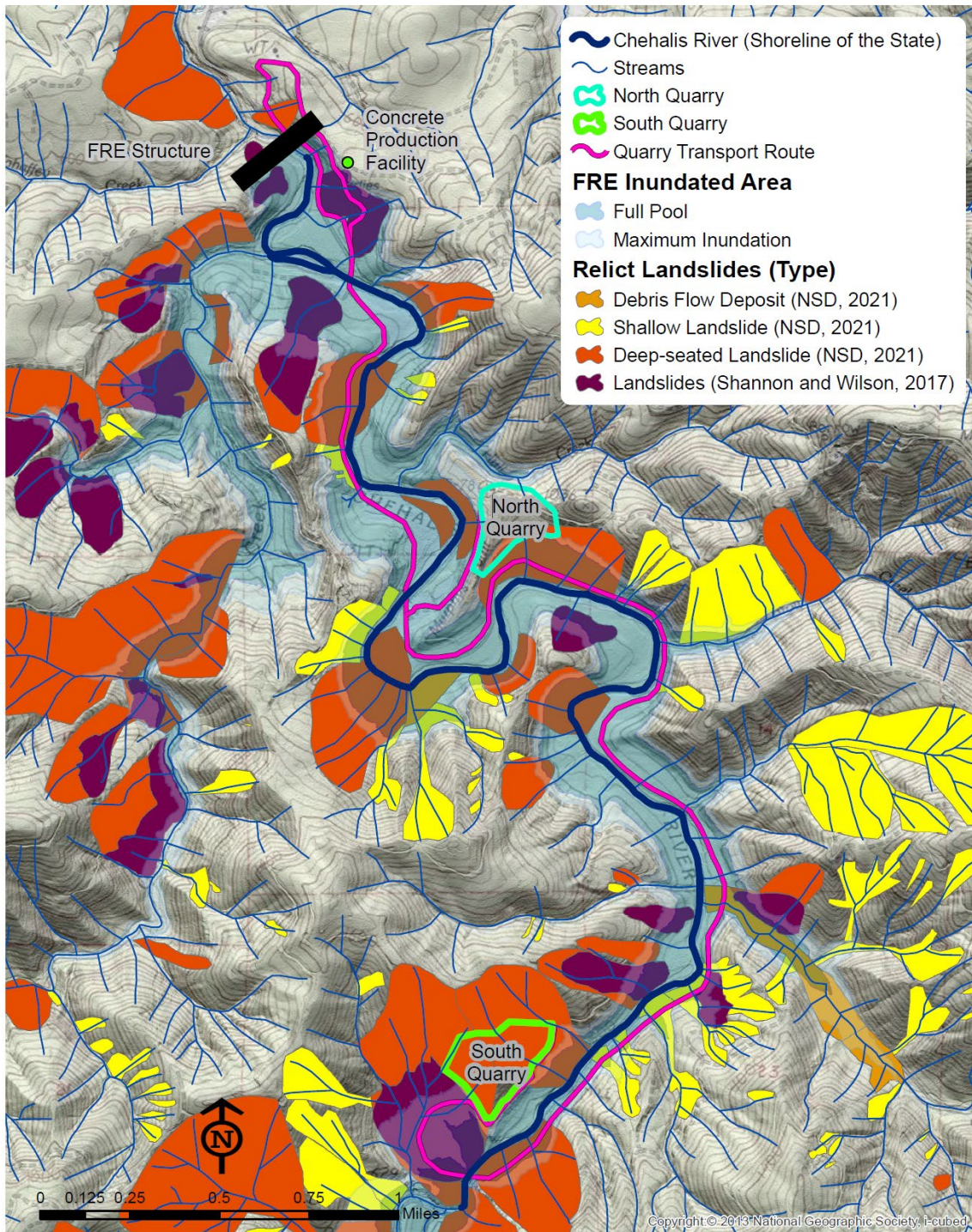


Figure 3: Proposed quarry locations, landslide hazards, trucking route (purple line) and proximity to Shorelines of the State (Chehalis River) and sensitive aquatic habitats. Approximately 1.5 million 10-yard dump truck trips may occur along this route. No environmental assessments were done to disclose or evaluate potential impacts to elements of the environment.

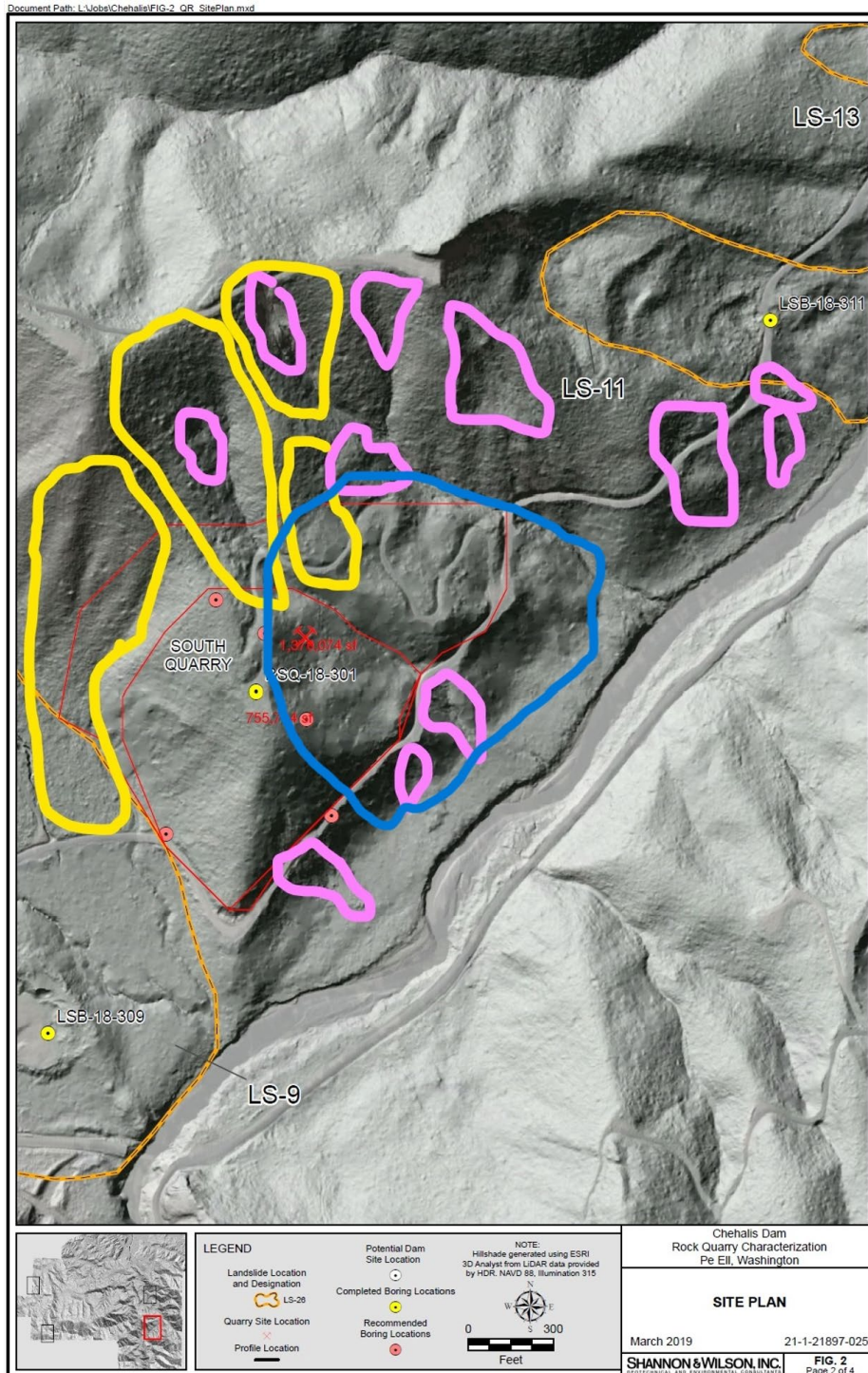


Figure 4: Evidence of slope instability within and adjacent to the proposed South Quarry. Pink polygons denote recent translational landslides. Yellow polygons denote older, deep-seated landslides and larger translational landslides. Blue represents an older relict landslide deposit landform. Two large deep-seated landslides mapped by Shannon and Wilson occur immediately east and west of the proposed quarry (orange dashed lines). Landslides within or adjacent to the quarry pose risks to occupational safety and aquatic habitat. A small slope failure has also occurred on the logging road situated on ridge at top the hillslope (pink polygon off road).

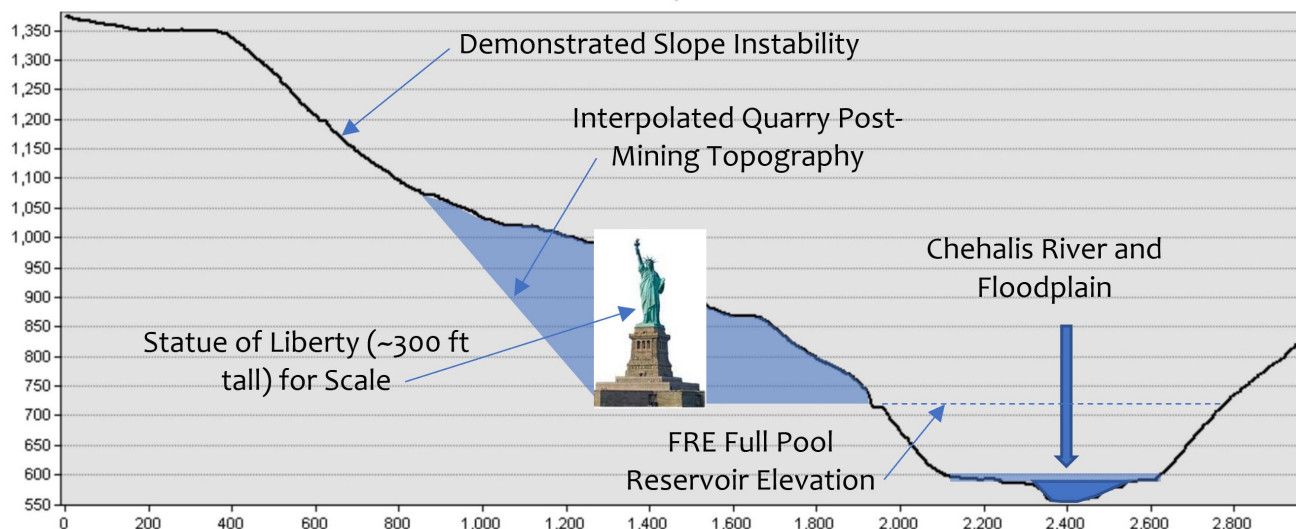


Figure 5: Example of Quarry Scale and Proximity to Shorelines of the State (Profile through South Quarry).

CONCLUSIONS

While the Quarry Operations memo provides more information on quantities of materials, estimated duration of actions, and horsepower of equipment likely to be used, this information combined with the information submitted for the NEPA and SEPA DEISs **still fails to meet the adequacy standards to inform a meaningful evaluation of potential impacts of the scale and intensity of the proposed actions.**

The DEISs and supporting technical documents related to the proposed development of the North and South Quarries expose that 1) significant impacts are likely, 2) monstrous data gaps exist, and 3) as proposed and presented, the quarries are not presented or analyzed in sufficient detail to meet NEPA and SEPA review requirements, let alone compliant with mine development regulatory requirements. At a minimum, the following information must be prepared and reviewed to enable meaningful environmental review and informed decision making under SEPA and NEPA:

1. **Detailed site plans and reclamation plans meeting regulatory requirements need to be provided.** These should include access road improvements, temporary and long-term spoils storage, and quarry remediation.
 - a. **RELEVANCE:** Without a site plan and reclamation plan, the extent, scale, intensity, and context of direct and indirect impacts are not disclosed to the public and to decision makers. It is incumbent on the applicant to disclose impacts and demonstrate how all applicable regulatory standards would be met. It would be arbitrary for the regulatory agencies to make a SEPA and NEPA decision and provide regulatory authorizations for the proposed FRE project without disclosure of how standards will be met.
2. **Supporting analyses and characterizations for the potentially impacted elements of the environment must be provided,** including but not limited to: geohazard analysis, plant and animal communities, surface and ground water resources, cultural resources, air quality and greenhouse gas emissions, noise and vibration analyses, and transportation/traffic analyses that are industry standard for development of surface mines.
 - a. **RELEVANCE:** Without characterization of the existing conditions at each quarry site and supporting impact analyses, the potential for direct, indirect, and cumulative impacts are not

disclosed to the public and decision makers. Based on the size of quarries, numbers of trips and proximity to sensitive habitats, it is very likely that significant adverse impacts may occur. It is incumbent on the applicant to disclose impacts and demonstrate how impacts will be less than significant, and if necessary, mitigated. It would be arbitrary for the regulatory agencies to make a SEPA and NEPA decision and provide regulatory authorizations for the proposed FRE project without characterization of existing conditions and disclosure of the potential impacts.

3. Mitigation measures to avoid, minimize, and mitigate significant impacts must be developed and provided.

- a. RELEVANCE: Without characterization of the existing conditions, development of a site plan, reclamation plan, and supporting impact analyses, it is unknown if there are significant impacts warranting mitigation and therefore, this information is not accurately disclosed to the public and decision makers. It is incumbent on the applicant to accurately disclose and evaluate all impacts and demonstrate impacts will be mitigated to result in no significant adverse impacts. It would be arbitrary for the regulatory agencies to make a SEPA and NEPA decision and provide regulatory authorizations for the proposed FRE project without disclosure of how the project will mitigate potential impacts to an acceptable level.

4. Demonstration that the proposed surface mine development would be compliant with current land use and zoning (it is not currently a designated mineral resource land) and all other regulatory requirements, including but not limited to the Growth Management Act, Lewis County Shoreline Master Program, and Lewis County Critical Areas ordinance.

- a. RELEVANCE: The applicant has not demonstrated that the proposed development of the quarries is compatible with the surrounding land uses, zoning, and Shoreline designation, as well as in compliance with other regulatory requirements (e.g., critical areas); therefore, the feasibility of the quarries has a high degree of uncertainty. It is incumbent on the applicant to accurately demonstrate that the proposed action is compliant with existing land use and all applicable regulatory codes and designations. It would be arbitrary for the regulatory agencies to make a SEPA and NEPA decision and provide regulatory authorizations for the proposed FRE project without demonstration that the proposed action is feasible and compliant with all applicable codes.

Public comments were previously provided outlining these and many other consequential data gaps, including multiple technical memos prepared by NSD and Saturna Watershed Sciences, incorporated herein by reference (Natural Systems Design and Saturna Watershed Sciences 2020a and 2020b, Natural Systems Design 2020a through 2020e). The Quarries Operations memo fails to provide sufficiently detailed or meaningful information or analysis of impacts from which the public and decision makers can weigh the environmental consequences of the development of the North and South quarries as a component of the proposed FRE project.

Therefore, we conclude that the analysis presented to date regarding the proposed quarries **fails to disclose or continues to significantly under-represent and mislead the public and decision makers regarding potential impacts to the environment and does not meet the adequacy standards of SEPA and NEPA environmental review**. As a result, granting a permit for the FRE project, as proposed, would be based on arbitrary factors that are inconsistent with the statutory regulatory processes for a project of this scale, intensity, and context.

REFERENCES

- Natural Systems Design and Saturna Watershed Sciences. 2020a. *Earth Discipline Report - Geology Technical Analysis Review*. Prepared for Quinault Indian Nation for Proposed Chehalis River Basin Flood Damage Reduction Project. Draft SEPA Environmental Impact Statement review. April 23, 2020.
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- Natural Systems Design. 2020a. *Cascade of FRE Facility Ecosystems Effects Technical Memo*. Prepared for Quinault Indian Nation for Proposed Chehalis River Basin Flood Damage Reduction Project. Draft Environmental Impact Statement SEPA review. April 23, 2020.
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- Natural Systems Design. 2020e. *Critical Review of Proposed Chehalis River Basin Flood Damage Reduction Project NEPA DEIS: Climate Change Impacts*. Draft Environmental Impact Statement NEPA review. October 2020.