

Appendix E

Construction Best Management Practices

1 GENERAL CONSTRUCTION BEST MANAGEMENT PRACTICES

At a minimum, Best Management Practices (BMPs) and other resource protection actions for general construction would include:

- In locating construction access and staging areas, the Applicant will avoid regulatory waterbodies including stream and stream buffers, and will use existing forest roads.
- Marbled Murrelet Protection Measures.
 - Nesting habitat suitability surveys for marbled murrelets, and timing restrictions for tree removal in or near suitable nesting habitat.
 - The Applicant would conduct pre-construction marbled murrelet nesting habitat suitability surveys in all forested areas in which tree removal is proposed, and in the disturbance-based threshold distance of 328 feet (for noise disturbance) from tree removal activities.
 - If the marbled murrelet survey identifies any suitable nesting trees that are scheduled for removal, these trees and those within 150 feet would be removed outside of the marbled murrelet nesting season (i.e., no tree removal between April 1 and September 23).
 - Forested areas that are deemed unsuitable for marbled murrelet nesting habitat would not have seasonal restrictions on tree removal (i.e., tree removal may occur year-round). However, tree removal within 478 feet (328 feet + 150-foot buffer) of suitable nesting trees would be subject to daily limiting operating procedures (LOP) during the nesting season (April 1-September 23). LOP would restrict tree removal activities to avoid sensitive diurnal periods: tree removal in these areas would not begin until two hours after sunrise and would cease two hours before sunset.
- All new and improved road construction would conform to regulatory guidelines as they apply to each set of roads at the time of permitting. In some cases, Washington State Forest Practices Rules standards (Title 222 Washington Administrative Code [WAC]) would apply to road construction. When applicable, these standards would be considered by the Applicant in the future design of permanent and temporary access roads, or existing road improvements.
- Installation of high visibility fence to define construction limits.
- Placement of all spoils in approved, upland locations. Any spoils (from river or upland excavation) beyond what could be accommodated in the identified spoils disposal areas would be taken offsite to approved locations.
- Maintenance and control of access to Proposed Action properties, as feasible, by installing signs, marking detour routes, hanging flagging, and providing information to the public, including advanced notification of construction activities.

- Development of a traffic control plan, if necessary.
- Stabilization of construction entrances.
- Development and implementation of a Spill Prevention Control and Countermeasures (SPCC) Plan for temporary fuel tanks, construction equipment, and on-site diesel generators, including identified refueling locations, spill control measures, and necessary containment of equipment and materials.
- Compliance with dust control policies and plans, including the use of water trucks.
- Stabilization of construction access roads and parking areas.
- Implementation of adaptive management for stormwater control during construction.
- Measurement of construction-related water quality parameters such as turbidity and pH throughout construction. Measurements would be taken at identified points as required for permit compliance, and both upstream and downstream measurements would be taken to determine construction-related changes.

2 EROSION CONTROL BMP DURING CONSTRUCTION

Construction would comply with the National Pollutant Discharge Elimination System (NPDES) permit, WAC 173-201A: Water Quality Standards for Surface Waters of the State of Washington, and other federal, state, and local codes and regulations. The Applicant would implement BMPs in accordance with Washington State Department of Ecology's (Ecology's) Stormwater Management Manual for Western Washington (Ecology 2019), current Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction and Standard Plans, and Lewis County standards (WSDOT 2024).

As part of a construction contract, the Applicant would require the contractor to implement temporary erosion and sediment control (TESC) measures and prepare a TESC plan for all aspects of construction, including clearing and grading in the FRE facility construction footprint, temporary access roads, improvements to existing access roads (i.e., to selected quarry site). The TESC plan would also apply to the implementation of the Vegetation Management Plan (VMP). Implementation of the TESC plan would minimize stormwater impacts such as storm flow runoff, soil erosion, waterborne sediment from exposed soils, and degradation of water quality from on-site pollutant sources. At a minimum, and for consideration as part of the Proposed Action, the following BMPs would be implemented to minimize the potential for erosion and sediment production:

- Use of straw bales, silt fencing, vegetation strips, brush barriers, or other suitable sedimentation control or containment devices.
- Washing truck tires to reduce tracking of sediments and potential aquatic invasive species from construction sites.
- Covering exposed soil stockpiles and exposed slopes with mulch, nets and blankets, plastic coverings, temporary seeding and sodding, and compost blankets.
- Use of straw mulch (certified free of noxious weeds and seeds) and erosion control matting to stabilize graded areas as appropriate.
- Retaining vegetation where possible to minimize soil erosion.
- Seeding or planting appropriate vegetation on exposed areas as soon as possible after work is completed.
- Construction of temporary sedimentation ponds to detain runoff water as appropriate.
- Use of Baker tanks, sediment traps, flow control structures, oil/water separators, ditches, and level spreaders to control erosion.
- Use of berms, ditching, and other on-site measures to prevent soil loss.

- Monitoring downstream turbidity during construction to document the potential effectiveness of implemented measures.
- Visual monitoring for signs of erosion and implementation of additional erosion control measures, as required.
- Relative to excavated slopes that may be prone to bank instability during construction:
 - Excavation would begin from the upper portion of the slope first to avoid stability issues.
 - Steep rock slopes would include pattern rock bolts for stability.
 - To reduce the potential for landslides, over-steepened slopes included as part of the permanent design would be stabilized to meet slope design criteria by methods including:
 - Introduction of horizontal drainage into vulnerable slopes to improve stability.
 - Placement of berms at the toes of steep slopes.
 - Introduction of tieback walls to retain slopes.

In addition, the Applicant would comply with all permit requirements and would monitor erosion during construction.

3 SPECIFIC IN-WATER AND OVER-WATER BMP

The Applicant would employ the following measures during construction to prevent potential effects on receiving water:

- Stormwater Pollution Prevention Plan. Mitigation for potential stormwater potential effects would be provided by implementing a stormwater pollution prevention plan and TESC plan during construction.
- Spill Response Plan. A spill response plan would be developed for construction. This plan would outline measures and procedures for response to hazardous material spills and entry of spilled substances to any receiving waters.
- Construction Water Management. Dewatering of areas behind cofferdams would be necessary. If surface water or groundwater were encountered during excavation, the water would be pumped out of the work area and settled prior to discharge.

Typical construction BMPs for working in, over, and near water include:

- Checking equipment for leaks and other problems that could result in the discharge of petroleum-based products or other material into receiving waters.
- Corrective actions, including those listed below, would be taken in the event of any discharge of oil, fuel, or chemicals into the water:
 - In the event of a spill, containment and cleanup efforts would begin immediately and be completed in an expeditious manner in accordance with all local, state, and federal regulations; these efforts would take precedence over normal work. Cleanup would include proper disposal of any spilled material and used cleanup material.
 - The cause of the spill would be assessed, and appropriate action taken to prevent further incidents or environmental damage.
 - Spills would be reported to Ecology’s Southwest Regional Spill Response Office at (360) 407-6300.
- Excess or waste materials would not be disposed of or abandoned waterward of the ordinary high water mark or allowed to enter waters of the state.
- Waste materials would be disposed of in an appropriate landfill.
- Demolition and construction materials would not be stored where wave action or upland runoff could cause materials to enter surface waters.
- Oil-absorbent materials would be stored on-site during construction in the event of a spill, or if any oil product is observed in the water.

- During construction, the Applicant would require the contractor to prevent or minimize potential adverse potential effects on groundwater quality from inadvertent spills by using construction BMPs, such as good housekeeping, proper storage of hazardous materials and petroleum products, and implementation of an SPCC plan.
- To limit the impact of construction-related noise on the environment, the proposed work would comply with applicable noise regulations by restricting construction activities to daytime hours.
- The Applicant would require the contractor to adhere to the following when pouring wet concrete for FRE facility-related infrastructure:
 - Wet concrete would be poured “in the dry” behind isolation cofferdams and would not be allowed to meet surface waters.
 - Forms for any concrete structure would be constructed and kept in place until the concrete is cured to prevent leaching.
 - During in-water concrete pouring for the FRE facility foundations, the contractor would test the pH of the water immediately downstream of the construction cofferdam to ensure there are no detrimental potential effects on water quality. If high pH readings are measured, concrete pouring would cease immediately, and the contractor would identify the source of contamination. Concrete pouring would not commence again until the issue was resolved. In addition, the contractor would test seepage water that may be present behind the cofferdam. If high pH readings are measured, seepage water would be pumped from the isolation structure to land for upland containment and disposal.
- Small pumps would be available on-site to capture seepage water from behind isolation cofferdams. Seepage water would be routed to a settling basin (sandbags filled with clean gravel or Baker tank, as appropriate), prior to discharge back to the temporary reservoir.
- Compost berms or socks would be available to protect the work area from seepage or erosion.

4 CONSTRUCTION BMP FOR THE PROTECTION OF FISH

The contractor would be required to submit dewatering plans to the Applicant a minimum of 60 days prior to in-water work, and to agencies 30 days prior for regulatory review to ensure consistency with existing environmental authorizations.

In coordination with United States Fish and Wildlife Service (USFWS), National Oceanic Atmospheric Administration (NOAA), and Washington Department of Fish and Wildlife (WDFW), the Applicant would develop appropriate protective measures to avoid or mitigate any potential effect on fish. The Applicant would submit a fish rescue and salvage plan to WDFW no less than 60 days prior to the start of fish removal activities for each in-water work period. The plan would outline the sequential methods for removing fish from the work area. The plan would require secondary written approval by WDFW prior to implementation to ensure consistency with the permit and protections for fish life in the mitigation area. The Applicant would require the contractor to adhere to typical construction BMPs for the protection of fish including:

- Adherence to the agency-approved in-water work window.
- Coordination with agencies to implement fish salvage plans for each stage of in-water work.
 - Fish salvage would be conducted in accordance with WSDOT fish exclusion protocols (WSDOT 2023).
 - Electroshocking would occur in accordance with NOAA (2000) electrofishing guidelines.
 - All electrofishing would be conducted by a person with electrofishing training to direct all activities.
 - All captured and collected fish would be transported to the upstream end of the work area and released at a suitable location for recovery and re-orientation (slow-moving pool habitat).
- Monitoring of temperature and dissolved oxygen during operations and subsequent refill periods.
- Screening of intakes – screens must have enough surface area to ensure that the through-screen velocity is less than 0.4 feet per second.
- Maintenance of fish screens to prevent injury or entrapment of fish.

5 IMPACT PILE DRIVING, BLASTING, AND QUARRY OPERATIONS BMPS

The Applicant would construct and operate the selected quarry under the regulation of an NPDES Sand and Gravel Permit issued by Ecology. For all blasting activities, the Applicant would require the contractor to prepare a blasting and debris management plan for agency submittal and approval a minimum of 60 days prior to blasting activities. Specific blasting minimization measures are defined below.

5.1 Impact Pile Driving and Blast Timing Restrictions

Impact pile driving and blast timing restrictions would be implemented to protect marbled murrelet during upland and in- or near-channel blasting. Although not surveyed, light detection and ranging (LiDAR) and aerial vegetation analyses indicate that pockets of nesting habitat potentially suitable for marbled murrelets may be present near the proposed FRE facility site and candidate quarry sites. The USFWS considers all un-surveyed suitable habitats to be occupied. Accordingly, for areas within one-quarter mile of the selected quarry site, and within one-quarter mile of the FRE facility foundation and tunnel blasting locations, the Applicant would commit to the following:

- Pre-construction surveys within one-quarter mile of all impact pile driving and blasting locations to identify suitable nesting trees for marbled murrelets.
- Within one-quarter mile of all suitable nesting trees, all impact pile-driving and blasting would adhere to LOP during the murrelet nesting season (April 1-September 23). Therefore, impact pile driving and blasting during the murrelet nesting season would only be authorized from two hours after official sunrise through two hours prior to official sunset.
- Outside of the murrelet nesting season (September 24-March 31), no impact pile-driving or blast timing restrictions would be required.

5.2 Blasting in Uplands

Controlled blasting would be required to comply with anticipated regulatory requirements and measures for the protection of personnel and property. Blasting in uplands more than 200 feet from active river flow would be accomplished using BMPs that would include:

- Test-blasting to be conducted to determine the minimum explosive charge weight required to satisfactorily excavate the bedrock for the bypass tunnel or quarry site.
- If test-blasting shows that debris is ejected to an unacceptable distance away from demolition, or dust generation is unacceptable, the contractor would be required to use blast mats or overburden cover to contain debris and dust.

5.3 Blasting In and Adjacent to the Chehalis River or Bypass Tunnel

No blasting would occur in the active river channel (i.e., with water flowing). Blasting for the FRE facility structure foundation excavation would occur while the river is diverted into the diversion tunnel. Such blasting would be conducted “in the dry,” with a minimum 25-foot-wide dry working space buffer between the blast site and the cofferdam isolating the in-water work area from active river flow.

To reduce or eliminate potential effects on fish, or to keep fish out of areas of harmful blasting pressure, the selected contractor would be required to attenuate vibration transference when blasting close to the active flow in the Chehalis River or its tributaries. Attenuation measures would include:

- Maintaining a dry in-water work area in this zone using sheet piling as cofferdams.
- Additional attenuation measures such as bubble curtains directly waterward of blast locations that would be applied if future blasting plans (to be developed as part of the construction contract) determine that explosive charge sizes exceed those typical for trenching.
- Selecting the minimum size charge and type of explosives necessary to accomplish the excavation.
- If buffer distances are not defined by the governing jurisdictions, buffer distances identified in industry standards and by other government entities would be considered and employed, such as the Alaska Department of Fish and Game’s (ADFG’s) Blasting Standards for the Protection of Fish (ADFG 1991) which recommends a 50-foot buffer distance for use of the 1-2 pound explosive charges typically used for trenching excavation. Larger buffer distances may be required for larger explosive charges.

Prior to rock blasting, the contractor would be required to provide a rock blasting plan for review. In addition to the requirements above, the contractor would be required to follow local, state, federal, and industry standards for safety and environmental protection during blasting, including:

- Safety procedures that minimize the potential for human presence in the blasting area and flyrock zone (the area in which blast-induced rockfall could occur) during the blasting period.
- Compliance with codes and permit requirements governing noise levels.
- Compliance with codes and permit requirements governing the times and locations of blasting, and avoidance of blasting during identified blast timing restrictions for wildlife protection, to the extent possible.
- Use of blast curtains and other debris containment practices to control debris produced by blasting activities.
- Monitoring of blast activities and limiting peak particle velocities induced by blasting operations.
- Use of water spray or other BMPs to control the dust produced from blasting activities.

Finally, Kolden (2013) reviewed blasting mitigation requirements for several projects requiring a Hydraulic Project Approval (HPA) from WDFW and noted several measures that have been required to

minimize the potential effects of blasting on aquatic species. In addition to conducting all blasting “in the dry” behind dewatered cofferdams, the Applicant would require the selected contractor to implement the following measures during in-channel or near-channel blasting:

- Charges shall be no larger than necessary to accomplish the task and shall be set in a manner (timing, frequency, location) such that instream concussion is minimized. Timing shall include microsecond delays to minimize the potential effect on fish.
- All blast material shall be removed and deposited in an approved upland disposal site so it would not re-enter the stream.
- Methods (blasting mats, sandbag berms, etc.) to contain and control slide debris resulting from blasting shall be in place prior to any blasting.

6 GENERAL RESTORATION/MITIGATION WORK IN WETLANDS BMP

The Applicant would develop appropriate protective measures to avoid or mitigate any potential effect on wetlands in accordance with the State Environmental Protection Agency and National Environmental Protection Agency. The Applicant would employ the following measures during construction to prevent potential effects on wetlands:

- Wetlands shall be identified and delineated in accordance with the requirements of the United States Army Corps of Engineers (Corps) Wetlands Delineation Manual (Environmental Laboratory 1987) and the 2010 Regional Supplement for the western United States (Corps 2010).
- As feasible, construction of the project will occur during the dry season to reduce impacts to aquatic resources.
- Prioritize minimizing impacts to higher-quality wetlands if there are multiple wetlands on site.
- Cross wetlands at their narrowest point.
- Keep wetland crossings widths to the minimum necessary, and reduce or eliminate road shoulders at wetland crossings if safety is not compromised.
- Size culverts correctly for best hydrologic connectivity.
- Use permeable fill material or culverts between wetlands to maintain hydrologic connectivity.
- Convert permanent impacts such as access roads to temporary impacts where feasible.
- Direct lights away from wetland.
- Use or upgrade existing paths, roads, or already disturbed areas so as to avoid previously undisturbed locations.
- Avoid disturbance to streambeds, wetland soils, and other vegetation.
- Avoid fragmenting wetland wildlife habitat by building away from wildlife travel corridors.
- Avoid crossing through, or bisecting, a wetland wildlife breeding area.
- Design and construct wildlife crossings that attempt to preserve existing light conditions and soil moisture levels.
- Restore stream channels to natural conditions if disturbance of the channel is unavoidable.
- Avoid impounding water up-gradient of the crossing.
- Maintain existing side slope grades, as much as possible, to minimize fill and any wetland loss.
- Minimize the extent of fill needed on top of a crossing structure by limiting the increase of the road grade as it approaches the crossing point.

- Schedule work so that excavations, deposition, or sediment-producing activities in wetlands avoid and minimize impacts during spawning and breeding seasons by using appropriate water quality protection techniques.

7 GENERAL RESTORATION/MITIGATION WORK IN FISH BEARING STREAMS BMP

The Applicant would obtain all local, state, and federal permits required for any activity that takes place in or around waters of the state, including habitat restoration projects. All work will be performed according to the requirements and conditions of the regulatory permits issued by federal, state, and local governments.

The Applicant will develop a Water Quality Protection and Monitoring Plan (WQPMP) for conducting water quality monitoring, to satisfy the monitoring and reporting requirements of the Water Quality Certifications that are ultimately issued for the project under the appropriate permits. The WQPMP will identify the timing and methodology for the water quality sampling during construction of the project, as well as methods of implementation and reporting. The Applicant will develop an exclusion and recovery plan to ensure safe capture and relocation of fish trapped in the work zone when stream flow has been diverted.

In addition to following the Construction BMP for the Protection of Fish, the Applicant will take the following measures to minimize potential impacts to fish, fish habitat, water quality, and the riparian environment.

Project Site Preparation BMPs

- When practical, construction or maintenance operations in waterbodies will be scheduled to occur in the least critical periods to avoid or minimize adverse effects to sensitive aquatic and aquatic-dependent species that live in or near the waterbody.
- When practical, instream work will be scheduled outside the spawning or migration seasons of resident or migratory fish and other important life history phases of sensitive species that could be affected by the project.
- The project work zone will be clearly delineated.
- Clearing limits associated with site access and construction will be limited to reduce disturbance of riparian vegetation, wetlands, and other sensitive channel features. Trimming and cutting is preferred to grubbing. Clearing limits for site disturbance will be clearly marked.
- Utilize established benchmarks for construction controls as described in Section 5 of the Board Manual of Forest Practices Hydraulic Projects (Washington Department of Natural Resources [WA DNR] 2013).
- Staging areas will be established (for construction equipment storage, vehicle storage, fueling, servicing, hazardous material storage, etc.) in a location and manner that will prevent erosion or

contamination to rivers or streams. These will be near the project site but outside of work area boundaries, aquatic management zones, wetlands, and sensitive soil areas.

- Prior to starting work in areas where the bank will be disturbed, TESC measures such as a filter fabric fence or straw wattles to prevent sediment from entering the stream will be installed. During construction, erodible soils will be covered with a mulch or matting to prevent erosion, and erodible soils will be sloped to route water into settling areas away from streams.
- After completion of work, but before removing the TESC measures, sediment accumulated during the project from behind the TESC measures will be removed and deposited in a location where it cannot enter typed water.

Dewatering BMPs

- Passive gravity flow diversions will be used when practical instead of pumping.
- The work area at both the upstream and downstream ends will be isolated by placing cofferdams made of gravel filled bags, ecology blocks, or a similar device and then diverting the flow around the work area before beginning any work in the channel.
- Cofferdams will be overlain with plastic or filter fabric on the upstream side to contain sediment. Accumulated silt would be removed with the filter fabric upon completion of the project.
- If gravel bags are used as cofferdams, after project completion the bags can be slit to allow the gravel to disperse downstream, provided the gravel is rounded and clean (e.g., pea gravel). The bags and any associated debris will be removed from the site. If necessary, hand tools can be used to ensure stream flow and fish passage is not impeded by the gravel.
- Clean diverted water will be discharged back into the channel downstream as close as possible to the project site to maintain flows for fish and reduce the length of stream that needs to be dewatered.
- Stream beds typically have substantial subsurface water flow which must be captured and removed from the construction site. This dirty water (i.e., wastewater) cannot be discharged directly into typed waters. A sump will be installed within the work area for dewatering. The pump outlets will be placed upland a sufficient distance from the stream channel to allow the natural vegetation to filter sediments before wastewater reaches the channel.
- Pumps used for dewatering the job site will be equipped with screens to prevent injury of fish pursuant to Revised Code of Washington (RCW) 77.57.010 and RCW 77.57.070. The pump intake will be screened by one of the following:
 - Perforated plate: 0.094 inch (maximum opening diameter).
 - Profile bar: 0.069 inch (maximum width opening).
 - Woven wire: 0.087 inch (maximum opening in the narrow direction).
- The open area for all types of fish guards will be a minimum of 27 percent and the screened intake will consist of a facility with enough surface area to ensure that the velocity through the screen is less than 0.4 feet per second.

- The screen will be kept in place whenever water is withdrawn from the stream through the pump intake, and the screen will be maintained to prevent injury or entrapment of juvenile fish.
- When pumps are used as the primary or secondary method of diverting flow around the isolated work area, plans will be in place for accessing additional backup pumps in the event of extremes in flow caused by weather or other factors.

Water Quality BMPs

- Site-specific spill prevention and erosion control plans will be established prior to beginning work.
- Wood that has been treated with creosote or pentachlorophenol will not be used in any part of a structure that comes in contact with the water.
- Preventive measures will be taken to ensure no chemicals or any other toxic or harmful materials are allowed to enter or leach into the stream.
- Minimize sediment delivery to typed water.
- All project waste material such as construction debris, silt, excess dirt, or overburden material will be disposed above the limits of floodwater in an approved upland disposal site.
- Work will stop if high flow conditions that may cause siltation are encountered during the project or if the cofferdams are compromised. The work will not re-start work until the flow subsides.
- Uncured concrete or concrete by-products will not be allowed to enter the stream at any time during construction. All forms used for concrete will be completely sealed to prevent uncured concrete from getting into the stream.
- Ensure that all materials and equipment used for construction, monitoring, and fish salvage are free of aquatic invasive species. Decontaminate all materials and equipment so that no viable invasive species are transported to or from the job site.

Equipment Operation BMPs

- Where practical, based on project scale and site conditions, the work will be accomplished by small, low ground pressure equipment, and labor tools.
- Where possible, equipment will be operated from the road, road shoulder, bridge, top of the bank, dry gravel bar, work platform, or similar out-of-water location. In-water equipment operation will be avoided when practical, but where necessary it will be identified and addressed in the spill prevention and erosion control plan.
- Daily equipment for leaks and any necessary repairs will be made prior to commencing work activities along the stream. Equipment will be free of external petroleum-based products while working around the stream. Accumulations of soil or debris will be removed from the drive mechanisms (wheels, tires, tracks, etc.) and undercarriage of equipment prior to working near or in the stream.

- Equipment will only be operated in the stream channel only if the drive mechanisms do not enter the channel or when the work area is dry or within an area where the stream flow is bypassed.
- Equipment use will be limited near the stream to specific access and work corridors to minimize disturbance to stream banks and vegetation.
- Servicing, refueling, and maintenance of equipment will occur in an upland area to prevent contamination of surface waters. When practical, this service site will be located at least 200 feet from any receiving waters. Fueling areas will be equipped with sufficient spill containment supplies to prevent a spill from reaching typed waters.

Site Restoration BMPs

Alteration or disturbance of the bank and vegetation will be limited to that necessary to construct the project. Trimming and cutting riparian vegetation will be the preferred method to stump removal. Affected bed and bank areas will be restored to pre-project condition. This includes regrading and restoring banks and channel beds back to natural contours, removing unnecessary fill, controlling the potential for invasive species, revegetating disturbed areas with native vegetation, and restoring wood loading in the channel consistent with the rest of the stream. A revegetation plan will be developed for disturbed sites.

- Any trees cut during the project, that otherwise would be required to be left by forest practices riparian management rules, will be placed on the bank or in the stream to provide fish habitat and restore natural stream processes.
- In-stream flows will not be returned to the project area until all in-channel work is completed and the banks are adequately stabilized to minimize sediment delivery to the stream or stream channel.
- Removal of all structures, materials, or equipment from the site and disposal of all excess spoils and/or waste materials will be done properly upon completion of the project.
- The channel bed, bank, and shoreline areas will be restored similar to their pre-project natural condition.
- The revegetation plan for the site will consider the precipitation zone, species native to the site, and the likelihood of natural revegetation. To the extent practical, the replanting of wood vegetation will take place between October 31 and March 30.

8 GENERAL RESTORATION/MITIGATION WORK IN MARBLED MURRELET HABITAT BMP

The Applicant will consult with WDFW for information on the existence, location, and status of occupied murrelet stands. The Applicant would conduct pre-construction marbled murrelet nesting habitat suitability surveys in all forested areas in which tree removal is proposed, and in the disturbance-based threshold distance of 328 feet (for noise disturbance) from tree removal activities. This includes the FRE facility construction footprint, access roads (temporary and permanent), staging areas, quarry site development areas, Pe Ell water system corridor, debris removal yard, and proposed areas of selective tree removal in the temporary reservoir under the VMP.

- Marbled murrelet surveys will follow the protocol listed in WAC 222-12-090 (Section 14 of the Board Manual of Forest Practices Hydraulic Projects [WA DNR 2023]).
- If the marbled murrelet nesting habitat suitability survey identifies any suitable nesting trees that are scheduled for removal, these trees, and those within 150 feet, would be removed outside of the marbled murrelet nesting season (i.e., no tree removal between April 1 and September 23).
- Forested areas that are deemed unsuitable for marbled murrelet nesting habitat would not have seasonal restrictions on tree removal (i.e., tree removal may occur year-round). However, tree removal within 478 feet (328 feet + 150-foot buffer) of suitable nesting trees would be subject to daily LOP during the nesting season (April 1-September 23). LOP would restrict tree removal activities to avoid sensitive diurnal periods: tree removal in these areas would not begin until two hours after sunrise and would cease two hours before sunset.

The Applicant will minimize disturbance during the “daily peak activity period” (one hour before to two hours after official sunrise and one hour before to one hour after official sunset) within the “critical nesting season” (April 1-August 31) for the following activities within one-quarter mile of an occupied marbled murrelet site:

- Road construction and blasting (WAC 222-24030 (11)).
- Felling/bucking (WAC 222-16-050 (6)).
- Cable yarding (WAC 222-16-060 (8)).
- Helicopter yarding or other operations (WAC 222-30-065 (2)).
- Ground-based yarding or heavy equipment operation (WAC 222-30-070 (11)).
- Slash disposal or prescribed burning (WAC 222-30-100 (8)).

9 GENERAL RESTORATION/MITIGATION WORK IN FISH AND WILDLIFE HABITAT CONSERVATION AREAS AND STATE PRIORITY HABITATS BMP

Construction will follow the appropriate BMPs for the habitat type (i.e., wetlands – Working in Wetlands BMP, etc.). The applicant will prepare a critical areas report for a habitat conservation area by a qualified professional who is a biologist with experience preparing reports for the relevant type of habitat. The report will include:

- The project area.
- All habitat conservation areas and recommended buffers within 300 feet of the project area.
- All shoreline areas, floodplains, other critical areas, and related buffers within 300 feet of the project area.
- A habitat assessment with:
 - A detailed description of vegetation on and adjacent to the project area and its associated buffer.
 - Identification of any species of local importance, priority species, or endangered, threatened, sensitive, or candidate species that have a primary association with habitat on or adjacent to the project area, and assessment of potential project impacts to the use of the site by the species.
 - A discussion of any federal, state, or local special management recommendations, including WDFW habitat management recommendations, that have been developed for species or habitats located on or adjacent to the project area.
 - A detailed discussion of the direct and indirect potential impacts on habitat by the project, including potential impacts to water quality.
 - A discussion of measures, including avoidance, minimization, and mitigation, proposed to preserve existing habitats and restore any habitat that was degraded prior to the current proposed land use activity and to be conducted in accordance with the mitigation sequencing order specified in Lewis County Code (LCC) 17.38.240.
 - A discussion of ongoing management practices that will protect habitat after the project site has been developed, including proposed monitoring and maintenance programs.

Anadromous Fish

All activities, uses, and alterations proposed to be located in water bodies used by anadromous fish or in areas that affect such water bodies shall give special consideration to the preservation and enhancement of anadromous fish habitat, and will adhere to the following standards:

- Activities will occur only during the allowable work window as designated by the WDFW for the applicable species.
- The activity will be designed so that it will not degrade the functions or values of the fish habitat or other critical areas.
- Shoreline erosion control measures will be designed to use bioengineering methods or soft armoring techniques, according to an approved critical area report.
- Any impacts to the functions or values of the habitat conservation area will be mitigated in accordance with an approved critical area report.

Wetland Habitats

All proposed activities within or adjacent to habitat conservation areas containing wetlands shall conform to the wetland development performance standards set forth in LCC Chapter 17.38.

10 REFERENCES

- ADFG (Alaska Department of Fish and Game), 1991. *Blasting Standards For the Protection of Fish*. Accessed at: Alaska Department of Fish and Game Blasting Standards for the Protection of Fish (arlis.org).
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