# Appendix 2.7-1
# Mitigation Measures

**Earth**

***Construction and Decommissioning***

*Geology and Soils*

Mitigation measures proposed for construction will reduce soil disturbance and erosion and reduce the potential for impacts associated with geologic hazards. General mitigation measures will include:

- The most effective method of reducing soil erosion is limiting site disturbance. Vegetation removal will be limited to the extent possible during construction, which will preserve vegetation cover to shield the soils from the elements, slowing runoff velocity, increasing infiltration time, and holding soils in place.
- Project construction will comply with the applicable county critical area regulations pertaining to erosion hazards. The development standards in the LCC 17.38 prescribe actions such as minimizing ground disturbance and preserving undergrowth, wherever feasible. The code requires that clearing, grading, and other construction activities not aggravate or result in slope instability or surface sloughing. The Applicant will not conduct clearing and grading during the wet season unless adequate provisions for wet season erosion have been identified and implemented. Demonstrating compliance with the requirements will require site-specific review of final plans for the Project relative to erosion hazard areas in Lewis County. Compliance with the CAOs in both counties will be required and will involve development of BMPs and minimization measures to address erosion due to construction in erosion hazard areas.
- The Applicant will implement a Construction SWPPP that satisfies the requirements of the NPDES General Permit for Stormwater Discharges Associated with Construction Activities will be implemented. The SWPPP will include BMPs recommended by Ecology's 2012 *Stormwater Management Manual for Western Washington* (as amended in December 2014) and consistent with Lewis and Thurston counties' stormwater regulations for the facilities constructed in each respective county. The construction SWPPP will include measures for temporary erosion and sedimentation control and will identify a regular inspection and maintenance schedule for all erosion control structures.
- Erosion and sedimentation control measures will be implemented at the beginning of the construction process. Measures will include, but are not limited to, installation of a stabilized construction entrance, wheel wash, silt fences, seeding, mulching, and dust control. Additional erosion control supplies, including sandbags and channel-lining materials, may be stored onsite for emergency use. The Project Area will be monitored for erosion on a weekly basis and after large rainfall events and corrective action taken as needed. Soil stockpiles will be stabilized and protected from erosion. Soils will also be stabilized before a holiday or weekend if needed based upon forecasts of precipitation.
- Heavy equipment and vehicles will only be operated on access roads and within approved construction footprints. Off-road construction will be limited to the extent feasible during wet conditions.
- Project design will adhere to seismic design standards in the IBC, Lewis County Building Code (Chapter 15), and Thurston County Building Code (Chapter 14) will be applied to minimize the likelihood of negative impacts from ground motion.

- WTG foundations will be designed based on loads provided by VESTAS, which include the loading from an earthquake. A pseudoptotic, (dynamic) slope stability analysis was performed on typical slope stability sections across the Project to model the loading from a design earthquake event. The analysis indicated that two locations need to be mitigated to reduce the risk of landslide during the event of an earthquake. These locations will be mitigated/stabilized during the final design of the site. Other proposed structures such as the O&M Facility will be designed per the building code for the Project Area and have a low risk of sustaining any damage during earthquake.
- Prior to Project construction, subsurface soil and rock types and strength properties will be confirmed through a detailed geotechnical investigation of the specific locations of all Project elements, including WTGs, access roads, underground trenching corridors, electrical grounding systems, and the substation and O&M Facility locations. If detailed geotechnical investigations indicate potential for slope instability at Project facilities, the Applicant will ensure that design of these facilities includes proper engineering to account for this risk and relocate facilities on site to avoid this risk.
- A geotechnical engineer licensed in Washington State will be retained to review and approve all grading, erosion, and drainage control plans prior to construction to assist in reducing the landslide and liquefaction risks from and to the Project.
- A hazards assessment and geotechnical boring will be completed for proposed WTG locations prior to foundation design. If necessary, WTGs will be relocated to avoid unstable areas.
- The Project will comply with applicable Washington State building codes and the building codes enforced in Lewis County and Thurston County for the facilities constructed in each respective county when construction commences.
- Construction of the gen-tie line and collector system will minimize clearing or grading of soil or vegetation.
- Excess spoil materials from cut activities will be used as fill for Project construction to the extent possible. Spoils which cannot be used at the site will be disposed of at Vail Tree Farm locations approved by Weyerhaeuser.

*Geologic Hazards*

- The Project will meet the development standards Thurston and Lewis counties' respective CAOs. Chapter 17 of the LCC and Chapter 24 of the TCC outline the development standards for construction. For the Project, these will include standards for development in erosion hazard, landslide hazard, and volcanic hazard areas (as impacts on channel migration zones are not anticipated, mitigation measures are not proposed).
- Project construction will comply with the applicable critical area regulations pertaining to landslide hazards in each county. The LCC 17.38 and TCC (Title 24, Chapter 35) prescribe specific development standards for landslide hazard areas, which are meant to demonstrate that clearing, grading, and other construction activities not aggravate or result in slope instability or surface sloughing. Demonstrating compliance with the requirements will require site-specific review of final plans for the Project relative to the various types of landslide hazard areas identified in the respective codes for each county. Compliance with the CAOs in both counties will be required and will involve development of BMPs and minimization measures to address construction in landslide hazard area.

*Erosion Hazard*

- Locations of erosion hazard areas present within the Project's disturbance footprint will be identified by site-specific inspection and will be considered during development of erosion control plans for the Project. Clearing and grading within erosion hazard areas will be limited to the area approved for development. Should such activities need to be conducted during the wet season (October 1 through May 1), the Applicant will identify specific BMPs to minimize wet season erosion.
- An erosion control plan for a severe and moderate erosion hazard areas will incorporate the following and will be coordinated with requirements under other county codes, state NPDES permits, and other agency requirements:
    - Alteration of topography and disturbance and removal of vegetation will be minimized by location on the least sensitive portion of the site to the extent practicable
    - Roads, driveways, other vehicular access, trails, walkways, and parking areas will be located in the least sensitive area of the site and designed with low gradients and/or parallel to the natural contours of the site to the extent practicable.
- Construction activities within the shoreline jurisdiction of the Skookumchuck River in Thurston County will comply with applicable county critical areas regulations pertaining to erosion hazards. Gen-tie construction activities within the shoreline jurisdiction of Hanaford Creek, Packwood Creek, and the TransAlta Ponds will comply with applicable Lewis County shoreline and critical areas regulations pertaining to erosion hazards. Soil erosion will be reduced through implementing a SWPPP as required by the Construction Stormwater General NPDES Permit, as well as BMPs that will include covering exposed soils, managing runoff, and revegetating temporary disturbed soils as soon as possible following construction.

*Landslide Hazard*

- A slope analysis and field verification of springs and seeps will be performed during a site-specific evaluation, with landslide hazards identified at that time. If identified, the Applicant will engineer construction and permanent site stabilization to comply with applicable codes.
- Development in landslide hazard areas will be designed so it does not increase the threat of the geologic hazard to other properties that will likely be affected in the event of a slope failure. Engineering and design measures will be based on the professional opinion of a geotechnical professional.
- Project design and construction activities will comply with procedures implemented at active timber operations and Washington Forest Protection Act (WFPA) requirements.
- Should a landslide occur in the Project construction area, the Applicant will work with the landowner to secure the site to ensure construction worker safety and will design and implement an appropriate site stabilization approach prior to continuing construction in the area.

*Seismic Hazard*

- The Applicant has conducted a site-specific geotechnical assessment of WTG locations to identify potential seismic hazards. If subject to seismic risk, the applicant will implement appropriate engineering design based on analysis by a qualified professional of the best

available engineering and geological practices that either eliminate or minimize the risk of structural damage or injury resulting from seismically induced settlement or soil liquefaction.

- In Lewis County, structures in seismic hazard areas will conform to applicable analysis and design criteria of the IBC as adopted by Lewis County. As indicated in Section 3.1.4.1 two WTG locations (S20 and S23) were identified as susceptible to landslide risk. These locations will be mitigated/stabilized during the final design of the site (Nofal 2018). Mitigation options include additional excavations or foundation soil improvements (RGI 2018)
- In Thurston County, the O&M Facility will be subject to the design requirements and review process in Title 14 TCC, Buildings and Construction.
- As discussed in Section 3.6.5.2, the Applicant will develop and implement an operations Site Access Plan in coordination with Weyerhaeuser to inform recreation permit holders and Weyerhaeuser staff of potential Project hazards, safety measures that permit holder and staff must respect, and activities which are prohibited in the vicinity of Project facilities. This plan will address avoidance of areas adjacent to the WTGs.

*Channel Migration Zones*

- The Applicant will consider site-specific stream conditions along the gen-tie line to determine whether channel migration zones are present; the Applicant will avoid construction of gen-tie line poles in channel migration zones.

***Operation***

*Geology and Soils*

Many of the mitigation measures, such as mitigation measures for where the Project could be constructed, described above for construction will help ensure that there will be minimal long-term impacts to earth resources. General mitigation measures will include:

- Temporary erosion control measures will be maintained until vegetation is reestablished and/or permanent erosion control measures are put in place
- Long-term storm-water management and erosion control measures will be inspected to assure that they are functioning adequately
- Spill prevention, control, and countermeasures planning will be established for oil storage facilities and equipment that meet USEPA applicability requirements.

*Geologic Hazards*

- The mitigation measures for geologic hazards during construction will also be applicable during operation.

**Air**

***Construction and Decommissioning***

- All vehicles and equipment used during construction and decommissioning will comply with applicable federal and state air quality regulations for exhaust emissions

- Vehicles and equipment used during construction and decommissioning will be in good working condition and properly maintained to minimize exhaust emissions and odors
- Idling will be minimized, and equipment will be shut down when not in use
- Carpooling among construction workers will be encouraged
- Speed limits on Project private access roads will be a maximum of 25 mph to minimize fugitive dust emissions
- Truck beds will be covered in accordance with local, state, and federal requirements when transporting dirt or soil on public roads
- No cleared woody material will be burned, either on or offsite
- A fugitive dust plan will be implemented, which outlines monitoring and control measures that will reduce fugitive dust during construction
    - Construction materials that could be a source of dust will be managed to minimize fugitive dust emissions
    - Dust-suppressant chemicals will be applied only when needed, and the application will be timed to avoid or minimize wash-off by rainfall
    - Dust will be controlled as needed by spraying water on dry, exposed soil
    - If located at the Project construction site within Lewis County, operation of the portable rock crusher and portable concrete batch plant will follow applicable requirements of SWCAA, including notifying the agency prior to commencing operations and submitting an emission inventory report to the agency
    - Soil stockpiles will be monitored for wind erosion and treated if necessary to minimize surface losses
- Project access roads will be constructed and surfaced to DNR Forest Practices Act standards
- Following construction, areas disturbed during construction and not occupied by permanent Project facilities will be restored in a manner to prevent future erosion which may release fugitive dust
- After decommissioning, disturbed areas will be restored to prevent future erosion and fugitive dust.

**Operation**

The Project will employ approximately 8 full-time workers during core operating hours, resulting in approximately 32 worker trips added to peak-hour background traffic. Operation of the Project will result in potential emissions generated by maintenance and operation vehicles; these emissions will be small, intermittent, and geographically localized. While operational air impacts will be minimal, the following BMPs will be implemented, as needed, to minimize potential impacts resulting from intermittent use of access roads by maintenance and operation vehicles:

- All vehicles and equipment used during operation and maintenance will comply with applicable federal and state air quality regulations for exhaust emissions
- Vehicles and equipment used during operation and maintenance activities will be in good working condition and properly maintained to minimize exhaust emissions and odors

- Idling will be minimized, and equipment will be shut down when not in use
- Speed limits on Project private access roads will be a maximum of 25 mph to minimize fugitive dust emissions
- Permanent Project access road surfaces will be selected and maintained to minimize fugitive dust emissions. Dust palliatives can be used if necessary.

**Water Resources**

***Construction and Decommissioning***

*Surface Water, Water Quality, and Stormwater Runoff*

- Erosion and sedimentation control will be standard practice during the active construction, restoration, and cleanup stages of the construction process, along with decommissioning (see Section 3.1.6 for more information on proposed mitigation measures and BMPs). Any work associated with the gen-tie line, which may be adjacent to streams (or wetlands), will adhere to applicable laws, including federal, state, and local regulations. The Project will use the existing Weyerhaeuser roadway system. The anticipated road improvements and new access spur roads to each WTG site will not require any new stream crossings or any modification of existing stream crossings. Where new culverts are necessary to channelize stormwater captured on road surfaces, they will be installed pursuant to the DNR Road Maintenance and Abandonment Plans and county requirements for stormwater control, as well as road construction standards outlined in the Applicant's lease terms with Weyerhaeuser. Culverts will be maintained to allow for unobstructed passage for water, including prompt removal of any blockages, to protect roadbeds, and prevent sedimentation of downstream waterbodies. Water and sediment control measures will be in place at all waterbodies and their buffers either crossed by access roads or otherwise not impacted by surface disturbance.
- A Shoreline Conditional Use Permit and Shoreline Substantial Development Permit will be requested from Lewis County for the gen-tie line aerial crossings and vegetation clearing of Hanaford Creek and Packwood Creek, respectively, and from Thurston County for the access road improvement within the Skookumchuck River shoreline jurisdiction area and vegetation removal/tree clearing. No in-water work will be performed in either of these surface waters. All structures will be placed outside of the 200-foot regulated shoreline jurisdiction of Hanaford Creek and Packwood Creek. Construction work and activities within the shoreline management areas of Hanaford Creek and Packwood Creek will be limited to construction vehicles accessing the shoreline areas in order to string the gen-tie line across the creek, most likely using a line gun, and conduct vegetation removal/tree clearing required to safely operate the transmission line. No other activities, excavation or grading, etc. will occur within the shoreline areas of Hanaford Creek or Packwood Creek. Minor fill within the shoreline management area associated with the Skookumchuck River will be performed using soil present onsite from adjacent excavation operations. Soil erosion will be reduced through implementing a SWPPP and erosion control BMPs, and all construction activities will comply with the applicable county critical areas regulations pertaining to erosion hazards.
- If required by WDFW, an HPA from WDFW will be received for all new aerial stream crossings for the gen-tie line and any new or improved stream crossings along access roads. Construction related to the gen-tie line will be at least 200 feet from stream banks on either side, and no heavy equipment will be used in the stream bed or riparian corridor for construction, where

avoidance is feasible. Where avoidance of the riparian corridor is not possible, equipment and vehicles will be kept above the ordinary high water mark and existing crossings will be used to the maximum extent possible.

- If these impacts are identified and cannot be avoided, including from vegetation clearing within the regulated shoreline areas or their buffers, impacts will be permitted through the appropriate local, state, and federal agencies. Should impacts require mitigation, it is expected that mitigation would be provided one or more of the following:

    1. Reseeding/site stabilization
    2. Purchase of mitigation credits with the Chehalis Basin Wetland Mitigation Bank
    3. Through acquiring conservation parcels in Pacific County in southwest Washington as mitigation for marbled murrelets and eagles (discussed further in Section 3.4.6.3). These parcels contain riparian habitat and present potential restoration/enhancement opportunities to mitigate for impacts to wetlands.

- The Applicant is working with the requisite permitting agencies to evaluate potential impacts and determine the appropriate mitigation as part of the permitting process under the Critical Areas Ordinance, Shoreline Management Act, and the Clean Water Act. All of the requisite permits will be obtained prior to any impacts to wetlands. The Applicant will continue to avoid any wetland impacts to the greatest extent possible through design refinements. Therefore, excavation or fill activities that may occur within wetlands and vegetation clearing within the regulated shorelines will be fully mitigated through restoration/restabilization efforts, purchase of mitigation bank credits, or additional mitigation benefits through a conservation easement planned for purchase by the Project where riparian habitat is present and potential opportunities for restoration and enhancement exist.

- The Applicant or its construction contractor will obtain coverage under Ecology's Sand and Gravel permit for establishment of temporary rock crushing and concrete batching activities at the construction site.

- Coverage under Ecology's CSWGP will be received for the Project and a SWPPP has been developed and will be implemented manage stormwater discharge and prevent erosion and sedimentation into nearby waterbodies. The Project will also comply with the applicable local stormwater capture, control, and treatment requirements required by Lewis and Thurston counties (see Section 3.3.2.3) for construction activities in each of the counties. See Section 3.1.6.1, Earth for more information on proposed mitigation measures and BMPs.

- Expansion of existing roads and new road segments will include the standard long-term drainage requirements specified by Weyerhaeuser for its roads and installed to comply with DNR regulations. In accordance with the Applicant's lease terms for road construction standards on Weyerhaeuser property, any soils, slash, or debris will be placed away from streams, stream buffers, and floodplains and stabilized to avoid stream entry. Depending on road gradients, soil conditions and proximity to any waters or ground water seeps, drainage features such as ditches, relief culverts, berms, or waterbars will be included in the road design, where appropriate, to prevent erosion and sedimentation of waters. Overall, with the implementation of the mitigation measures above, stormwater hydrology adjacent to Project construction areas is not expected to be affected, as construction stormwater discharges will be appropriately managed.

- Project construction staging areas will not be located within 100 feet of waterbodies to reduce the potential for contamination from spills. Stormwater pollutants will be managed by effective source control. All pollutants, including waste materials and demolition debris, will be handled and disposed of in a manner that does not result in contamination of stormwater. Concrete truck wash water will be collected into lined wash pits to avoid runoff and liners will be disposed of appropriately after use. Potential water pollutants that will be used and transported onsite (including fuels, lubricating fluids and chemical cleaners) will be handled and stored according to the SWPPP and the Spill Prevention, Control and Countermeasure Plan (SPCC Plan).The Applicant will use BMPs to control the use of disposal and waste materials during and following Project construction, including implementation of a spill prevention, contamination, and control plan. The Applicant will store hazardous materials, such as lubricants, in approved containers and storage facilities. The Applicant will avoid storing, transferring, or mixing of oils, fuels, or other hazardous material where accidental spills could enter surface water or groundwater. Maintenance, fueling, and repair of heavy equipment and vehicles will be conducted using spill prevention and control measures. Onsite fueling tanks will include secondary containment. Fuel tank and truck storage as well as vehicle fueling will be at least 100 feet from all streams, dry or flowing. Contaminated surfaces will be cleaned immediately following any spill incident. The Applicant will provide on-call spill response services either through a contract with a qualified environmental remediation services firm or with qualified in-house personnel.

*Groundwater*

- In accordance with Thurston County's CAO (TCC 24.10.030), the Applicant will submit a report identifying appropriate BMPs and describing how they will be used to prevent degradation of groundwater quality for activities within CARAs. Construction activities within Lewis County CARAs will comply with LCC requirements (Section 17.38.840).
- If groundwater is encountered during construction-related excavations it will be pumped from the excavation at a controlled rate to re-infiltrate into the soil at a nearby upland site.

*Public and Private Domestic Water Supplies*

- Prior to obtaining a Lewis County building permit, the Applicant will provide evidence of adequate water supply for the Project.
- Water used during construction will be purchased by the contractor from an offsite municipal vendor with a valid water right and transported to the Project Area in tanker trucks. There will be no water treatment requirements or methods onsite. Water used for dust suppression and concrete production will be reclaimed (non-potable), to the extent feasible. Non-toxic dust control agents such as lignin may be added to water used for dust suppression to improve efficiency and reduce water use.

*Floodplains*

- Structures associated with the gen-tie line will be sited to avoid development within the floodplain.

**Operation**

- Final designs for the permanent stormwater BMPs will be incorporated into the final construction plans and specifications. An operations manual for the permanent BMPs will be prepared and implemented throughout operation of the Project. Final stormwater control

measures will include measures to capture and infiltrate stormwater onsite in order to maintain the natural hydrology surrounding Project facilities.

- Operational BMPs will be adopted and implemented as part of the SPCC Plan and will include good housekeeping, preventive and corrective maintenance procedures, steps for spill prevention and emergency cleanup, employee training programs, and inspection and record keeping practices as necessary to prevent stormwater pollution. The wind farm operators and employees will periodically review the SPCC Plan against actual practice to ensure that the controls identified in the plan are adequate and that employees are adhering to them.
- As part of the required Public Water Supply Permit from Thurston County, an Applicant-owned 100-foot radius SCA will be established around the proposed groundwater well at the O&M Facility to protect it from potential contamination. The SCA must be free of existing contamination, structures, OSS components, stormwater control structures, or any potential sources of contamination. The size and area of the SCA will be approved by a Thurston County health officer. During review of the SCA, the health officer may determine that the size of the 100-foot-radius SCA be adjusted depending on the local geologic and hydrologic conditions.

**Biological Resources**

***Pre-Construction Assessment***

Although pre-construction assessments are not a mitigation measure per-se, their purpose is to assess existing conditions of areas proposed for wind energy development and determine whether they include sensitive habitats, resources, or species which could be irretrievably impacted. Thus, these assessments represent the first step in impact mitigation – i.e., identification of sensitive resources that should be avoided through careful site selection and project design. As explained below, by avoiding certain development locations impacts to sensitive resources were avoided altogether.

- The Applicant followed a tiered evaluation process similar to the process outlined in the USFWS Land-Based Wind Energy Guidelines (WEG) (USFWS 2012) and WDFW Wind Development Guidelines to assess potential impacts of the Project and identify measures to avoid, minimize, and mitigate potentially adverse impacts. During Tier 1 site screening assessments per WEG, the scale of the Project was considerably reduced from 98 WTGs to 61 WTGs and then again to the current 38 WTG layout. The reduction in Project footprint eliminated WTGs in areas that contained suitable habitat and concentrated development in areas of active forest management, as summarized below.
    - Tier 1/Stage 1 – Preliminary Site Evaluation (Landscape Scale Screening)

      The intent of the Tier 1 analysis of the WEG is to identify landscape scale factors that could be important to wildlife such as large blocks of intact native habitat or intact ecological communities. Further, the analysis considers if a wind project is proposed in designated critical habitat for sensitive species. Similarly, Stage 1 of the ECPG is a landscape-scale analysis where a developer considers the potential occurrence of breeding, wintering, or migrating eagles. The Applicant conducted a landscape-level assessment of habitat for species of concern and requested existing information and literature from the USFWS and the WDFW and met with both agencies in May of 2011. This information informed the Applicant's site selection and ultimately led to a site located on active logging/forest management lands, which aligns with the Tier 1/Stage 1 objectives of selecting a Project area that would avoid and minimize impacts to wildlife and other ecological values.

Additionally, the Applicant's WTG layout limited WTGs to the ridgeline, which does not contain habitat for species of concern. The Applicant also evaluated at other options near the current Project area within Weyerhaeuser lands, but these other sites could not meet other economic and environmental constraints affecting the economic viability of the Project.

- Tier 2/Stage 1 – Site Characterization (Broad Characterization of One or More Potential Project Sites/Desktop Surveys)

  Based on the information received and decisions made during Tier 1/Stage 1, the Applicant conducted desktop surveys of the Plan Area and prepared a Site Characterization Study. Desktop surveys concluded that the Project could potentially support two ESA-protected listed avian species (murrelets and northern spotted owl), four ESA-protected aquatic species (bull trout, Chinook salmon, coho salmon, and steelhead), and the two BGEPA-protected eagle species. The Applicant determined that it could avoid all impacts to the four protected aquatic species. The Project was originally intended to be 98 WTGs. However, upon completion of desktop surveys, the Applicant discovered that preliminary WTG layouts overlapped with murrelet nesting areas and would be proximate to Spotted Owl Special Emphasis Areas (SOSEAs). The Applicant then decreased the size of the Project from 98 WTGs to 61 WTGs. This reduction moved the Project away from Skookumchuck Reservoir (with known eagle activity) and away from known SOSEAs and murrelet nesting areas to the southeast. This move allows the Applicant to further reduce impacts and risk of take of the Covered Species. The Applicant communicated the results of its Tier 1 and 2 site characterizations to the USFWS and WDFW in June of 2012. The Applicant then communicated the current layout during the 2013 and 2014 discussions regarding survey approaches, described below. In 2017 the Applicant reduced the Project to 38 WTGs, further minimizing Project impacts to wildlife, including the murrelet, golden eagle, and bald eagle.

- Tier 3/Stage 2, 3, 4 – Field Studies to Document Site Wildlife and Habitat and Predict Project Impacts

  The Applicant presented its initial survey protocols to the USFWS and WDFW, and the agencies supported the presented approach. General avian use studies and murrelet-specific studies started in 2013 and continued in 2014. The Applicant conducted eagle use surveys in 2015 through 2017 and added IdentiFlight® Scout units for survey support in 2017. The Applicant conducted bat acoustic surveys in 2015 and again in 2017. The Applicant added the second round of bat acoustic surveys in response to USFWS and WDFW recommendations of August 26, 2016, and September 1, 2016, respectively. These surveys are described in more detail in the Appendix 3.4-3.

  In response to the Tier 3 surveys, the Applicant removed the two WTG locations nearest to Skookumchuck Reservoir in the northwest portion of the Plan Area. The eagle use surveys indicated higher eagle use in the vicinity of these two WTGs in comparison to the rest of the Project. Throughout this time, the Applicant continued to coordinate with the USFWS and WDFW with respect to potential impacts to murrelets and bald and golden eagles.

***Construction and Decommissioning***

Impacts to vegetation and wildlife during construction and decommissioning will be minimized by the implementation of BMPs required as part of the NPDES Construction Stormwater Permit, HPA, and Lewis and Thurston County critical areas regulations.

*Plants*

- The Applicant will develop and implement a SWPPP. This design level plan will prescribe the use of BMPs that are standard features of such plans. The SWPPP will include BMPs to minimize the importation of invasive species, such as wheel wash of construction vehicles and dedicated construction entrances.
- Following final grading areas of temporary disturbance will be restored or revegetated where appropriate. The methods and goals for restoration will reflect the anticipated post-construction uses of these lands as described in Section 2.5.11. The Applicant will develop and implement a Temporary Construction Area Restoration Plan which will identify the specific restoration activities to be conducted in temporarily disturbed areas to restore the temporarily disturbed habitat and prevent erosion from occurring after construction activities have concluded. The Temporary Area Restoration Plan will include revegetation efforts, weed and invasive species treatments, and no less than two years of monitoring.
- During construction, the Applicant will minimize the potential for landslides and soil erosion as described in Section 3.1.6.1; these measures will minimize impacts to adjacent vegetation and habitat from uncontrolled landslide and erosion events.

*Wetlands*

- All Project facilities will be sited to avoid wetlands and wetland buffers and temporary erosion and sedimentation control measures will be installed to prevent sedimentation from discharging into the wetlands and wetland buffers. Portions of haul routes (see Section 3.11.4.1) where ground disturbance may be required to improve route access for oversize and overweight Project components, will be surveyed for the potential presence of wetlands and surface water resources prior to ground disturbance taking place. Should wetlands be found within construction footprints or their buffers, they will be identified and rated in accordance with critical area ordinance requirements.

*Wildlife*

- To minimize potential collisions with wildlife during construction and decommissioning, a vehicle speed limit of 25 miles per hour will be posted and enforced within the Project Area.

*Fish*

- Construction within the regulated shoreline buffer will be conducted in accordance with the mitigation requirements of the Substantial Shoreline Development permit. Erosion and sedimentation control measures will be implemented at the beginning of the construction process and will be incorporated into the design and contractual requirements to minimize the potential for sediment from the Project from entering headwater systems and streams. Erosion and sedimentation control will be standard practice during the active construction, restoration, and cleanup stages of the construction process. The Applicant will develop and implement a SWPPP. This design level plan will prescribe the use of BMPs that are standard features of such plans. The Project SWPPP will be based on and comply with Ecology's Stormwater Management Manual for Western Washington, the DNR Forest Practices Applications and Notifications

(FPA/N), the DNR Road Maintenance and Abandonment Planning (RMAP), any stipulations of the WDFW HPAs, and Lewis and Thurston County stormwater regulations.

- Disturbances to riparian habitat will be undertaken by the Applicant, but will be regulated under the forest practices requirements applicable to previous forestry/wind energy conversion management plans.

***Operations***

*Plants*

- Operation of the Project will not result in the potential for disturbance of vegetation communities or rare plants. During Project operation, maintenance activities will be confined to right-of-way, access roads, and areas surrounding Project components avoiding impact to vegetation. The Applicant will monitor vegetation re-establishment following implementation of the Temporary Construction Area Restoration plan. The Applicant will monitor re-vegetated areas for the presence of noxious weeds and will spot treat infestations via approved herbicides or hand pulling.

*Wildlife*

- As part of the Project and in accordance with the Land-Based WEG (USFWS 2012), the Applicant will develop and implement a Bird and Bat Conservation Strategy (BBCS) prior to Project operations. A wind energy project-specific BBCS is an example of a document or compilation of documents that lists the steps a developer has taken to apply these Guidelines to mitigate for adverse impacts and address the postconstruction monitoring efforts the developer intends to undertake. A developer may prepare a BBCS in stages, over time, as analysis and studies are undertaken for each tier. It will also address the postconstruction monitoring efforts for mortality and habitat effects. Any USFWS review of, or discussion with a developer, concerning its BBCS is advisory only, does not result in approval or disapproval of the BBCS by the USFWS, and does not constitute a federal agency action subject to the National Environmental Policy Act or other federal law applicable to such an action. A post-construction monitoring plan will be prepared, and fatality monitoring will occur for the first three years, and at designated intervals over the life of the permit in coordination with USFWS and WDFW.

- The Applicant will install self-supporting permanent meteorological towers, thereby minimizing avian collisions by avoiding the use of guy-lines to support the towers.

*Marbled Murrelets*

- The Applicant is applying for an Incidental Take Permit (ITP) for marbled murrelets. In coordination with USFWS, WDFW, and Lewis and Thurston counties critical areas ordinances, avoidance, minimization, and mitigation measures will be incorporated into the Project. These measures are detailed in the HCP, which satisfies the requirements for a fish and wildlife habitat mitigation plan under the CAO, LCC 17.38.510. These include:

    - To minimize potential collisions with murrelets during Project operation, seasonal WTG curtailment will be applied to WTGs that had the highest murrelet passage rate during pre-construction radar surveys. During the first three years of operation, the maximum

curtailment at the facility will include seasonal curtailment from May 1 to August 9 at 10 WTGs located at the eastern and western ends of the Project for a period of three hours each morning (i.e., 1.75 hours before sunrise and 1.25 hours after sunrise). This time period corresponds to the high-use flight period when murrelets travel between their marine foraging habitats and inland nesting habitat. Modifications to the curtailment program (e.g., duration and location of WTG curtailment) after the first three years of operations will be based on results collected during post-construction compliance monitoring and will be triggered through the Adaptive Management strategy. Furthermore, reduced seasonal curtailment could occur if alternative take reduction strategies emerge; they will be considered if they are demonstrated to be effective. Flight diverters will be installed on all aboveground transmission and distribution lines to minimize collision risk according to Avian Power Line Interaction Committee (APLIC) suggested practices (APLIC 2012). Technological advancements in line-marking systems now include diverters that are visible to birds in low-light conditions.

  - Flight diverters will be installed on all aboveground transmission and distribution lines to minimize collision risk according to Avian Power Line Interaction Committee (APLIC) suggested practices (APLIC 2012). Technological advancements in line-marking systems now include diverters that are visible to birds in low-light conditions. The exact locations are being determined at this time, based on several factors including habitat, waterbodies and resulting risk levels assessments.
  - To reduce the potential influence of artificial lighting on the murrelet flight behavior, shielding, baffles, or other hardware will be used on buildings or freestanding fixtures to promote down lighting (USFWS 2018b). Reduced use of lights will be incorporated into the Project design, consistent with Federal Aviation Administration (FAA) and operational safety requirements. Per FAA regulations, blinking red obstruction lighting will be installed on 26 of the 38 (68 percent) of the WTGs. A study in Michigan found the use of blinking lights reduced avian fatalities by 50 to 71 percent compared to non-blinking/steady burning lighting (Gehring et al. 2009).
  - To minimize potential for vehicle collisions with murrelets during Project operation, vehicle speed limits of 25 miles per hour will be posted and enforced for wind operations staff within the Project.
  - To reduce the potential for the artificial increase of potential nest predators in the Project and surrounding landscape, a garbage abatement policy will be in place that prohibits the disposal of garbage in the Project Area.

- The Applicant will fully mitigate the impacts of the taking of murrelets by acquiring conservation lands that promote the preservation and enhancement of suitable nesting habitat for murrelets. In coordination with the USFWS and other stakeholders, the Applicant will acquire conservation lands that are strategically located to maximize their biological significance for murrelets. Conservation lands will be selected to maximize habitat connectivity to areas of known murrelet occupancy or nesting and adjacency to other conservation or management lands to create larger blocks of protected space (USFWS 2017). Removal of abandoned or derelict fishing nets and other gear is an effective measure to reduce incidental mortality of murrelets. Net removal will be accomplished by providing funding to an organization already engaged in this work to

implement a net removal program, and is an integral part of the mitigation package for the Project.[1]

- The Applicant will convey a conservation easement to a non-profit conservation entity in perpetuity and designate the USFWS as a third-party beneficiary. A management plan for the conservation land will be developed by the conservation easement holder in a form acceptable to the Applicant, WDFW, and USFWS prior to the commencement of Project operations. The cost of the mitigation project will include funding for the easement-holder to implement the management plan. Acquisition of the conservation easement and development of the management plan will occur prior to commencement of the Covered Activities. The Applicant will partner with a nonprofit organization that will serve as its trustee to manage the parcel for the benefit of murrelets.

- Management actions that may be implemented to promote murrelet habitat are dependent on the landscape and habitat characteristics of the parcel but may include selective thinning to accelerate crown and limb development, 100-meter buffers to protect from windthrow and predator incursions, road decommissioning, tree planting, or brush management. In conjunction with the conservation easement holder, the conservation easement will be managed according to a long-term management plan ("Management Plan"). The Management Plan will include the activities that may be implemented to promote murrelet habitat; the nature and frequency of the activities, and will be tailored to the landscape and habitat characteristics of the conservation easement. The Management Plan will include an assessment and description of the baseline conditions of the conservation lands, a schedule of implementation for the management activities and associate cost thereof, adaptive management strategies, and reporting obligations. The Management Plan will be in a form acceptable to the conservation easement holder, the Applicant, WDFW, and USFWS, and finalized prior to the commencement of commercial operations. Further, should the conservation lands be utilized to provide mitigation for impacts to wetlands or regulated shorelines, the Management Plan will include the activities to be implemented to promote the enhancement or creation of riparian habitat to represent additive benefits. If mitigation for impacts to wetlands and riparian habitat within the regulated shoreline, relevant portions of the Management Plan will be prepared in coordination with the requisite regulatory agencies.

  The Applicant selected this approach because it provides a unique opportunity for meaningful conservation measures and because of the proven record of conservation success, organizational integrity, and stewardship goals of nonprofit organizations in the region. Funding a land acquisition program is considered to be the best method of obtaining effective ecological mitigation, and the level of funding would be commensurate with the level of impacts from the Project and habitat characteristics of the conservation land.

  - *Murrelet* Adaptive *Management*

[1] Net removal will occur in Puget Sound waters, where benefits of net removal for murrelets have been quantified, and an existing program has been established but had no ongoing funding. Murrelets might also benefit from removal of derelict fishing gear in Washington's Pacific Ocean waters, but no mechanism has been developed to quantify those benefits, and there is no corresponding opportunity to fund an established net removal program in the Pacific.

- An adaptive management strategy was developed to ensure that murrelet mortality remains within the authorized take limits of the murrelet. The strategy incorporates a feedback loop where the effectiveness of avoidance and minimization techniques are reevaluated when a fatality occurs that meets a particular threshold relative to the permitted take. Thresholds are presented as a tiered progression of potential levels of take that may lead to an exceedance of the permitted take for the Project. Each progressive level warrants an assessment of conditions and potential implementation of additional minimization measures if take is on a trajectory to exceed the level permitted for the 30-year term.
- A conservative estimate of 2.496 murrelet fatalities is predicted to occur per year. Adaptive management begins with the detection of one murrelet carcass so that information on the fatality and potential correlates of risk can be examined. As variability in the number of fatalities that occur per year is likely, and that the take permit review period will coincide with the five-year eagle review period, further adaptive management tiers will be based on short-term (Tiers 1-3) and long-term (Tier 4) review periods. Thresholds are designed to trigger adaptive management measures in time to respond to annual increases in fatalities and provide corrective actions to prevent a sustained high rate of take at the Project. Tiers are structured to respond to single fatalities (e.g., found on search plot or incidentally), rare events (e.g., three or more incidental fatalities), or increased fatality rates at different time scales: annually or sustained over a number of years. Each tier includes a progressively more detailed assessment of the fatality event or pattern and corresponding corrective action designed to ensure permit compliance and associated compensatory mitigation.
- The Applicant will implement adaptive management when the first fatality is discovered within a monitoring year and build upon the body of information already collected to help inform patterns and appropriate minimization measures (Table 3.4-12). Rare events such as incidental discoveries that exceed the permitted take are also recognized by implementing standard carcass searches (if not already being conducted), reviewing and revising the curtailment program if needed, and evaluating the efficacy of the sample design (Tier 2). Similarly, if a take estimate is higher than the conservative annual estimate of 2.496 murrelets within a monitoring year, radar or other available technology will be deployed to monitor and evaluate murrelet passage at the Project, and enhanced avoidance measures will be applied to high-risk areas or periods (Tier 3). To account for annual variation in fatality estimates among monitoring years, a rolling average will be calculated to ensure the rate is not on a trajectory to exceed the permitted take. If the level of take reaches or exceeds the permitted take, additional avoidance, minimization, and/or curtailment actions need to be initiated as necessary to avoid any unauthorized take.
- If a threshold is reached, the Applicant will schedule a conference call with USFWS to occur within two weeks of the discovery to discuss appropriate responses consistent with the following table:

**Summary of Stepwise Adaptive Management Process for Murrelet Take at the Skookumchuck Wind Power Project** (Based on a permitted take rate of 2.496 murrelets per year and totaling 75 murrelets (rounded up) over a 30-year permit period)

| Tier | Threshold | Threshold Relative to ITP Limit | Avoidance and Minimization Measures[1] |
|---|---|---|---|
| 1 | During any monitoring year, one murrelet carcass detected at any time. | Take is not on trajectory to exceed permit limit is permitted and fully mitigated. | • Assess murrelet fatality to determine if cause or risk factor can be determined (e.g., location, season, weather, estimated time of death, or other event) and whether management response is warranted. |
| 2 | Based on results of fatality monitoring during any monitoring year, the estimated fatality rate is on a trajectory that may exceed permitted take (e.g., annual take estimate of ≥ 3 individuals) or if three fatalities are found incidentally in any 12-month period outside of standardized carcass monitoring. | Take potentially on trajectory to exceed 30-year permit limit but is currently permitted | • Review and modify monitoring design to improve probability of detection as discussed in the Post-Construction Monitoring Plan.<br>• During intensive monitoring, if the site-wide probability a carcass is available to be found and detected by searches (g) is less than 0.31, the Applicant will modify the monitoring program to achieve a g value that is 0.31 or greater.<br>• Revise the turbine curtailment program if the pattern of fatalities at the Project indicates that adjustment to the selection or timing of turbines being curtailed may reduce fatalities (e.g., changing which turbines are curtailed and/or time of day or duration of curtailment). No change in maximum hours of curtailment.<br>• To address this rare event, initiate Evaluation Phase monitoring. |
| 3 | At the conclusion of any five-year monitoring period, the estimated average fatality rate is on a trajectory to exceed the level of permitted take (e.g., ≥13 murrelet fatalities estimated for Years 1-5, >25 murrelets for Years 1-10, etc.). | Take potentially on trajectory to exceed 30-year permit threshold but is currently permitted | • Consider alternative minimization options that may include the deployment of marine radar monitoring to evaluate passage rates at the Project to optimize effectiveness of curtailment strategy or other proven risk minimization technologies. Enhanced avoidance and minimization measures will be applied to high-risk areas or periods (e.g., nesting season), which may include revising the turbine curtailment program (e.g., changing which turbines are curtailed and/or time of day or duration of curtailment) if the pattern of fatalities at the Project indicates that adjustment to the selection or timing of the 10 turbines being curtailed may reduce fatalities. Additional curtailment not-to-exceed 900 turbine hours above the baseline (baseline = May 1-Aug. 9 at 10 turbines for 3 hours per day = 101 days x 10 turbines x 3 hours = 3,030 hours). Consider the need for a permit amendment. |

| Tier | Threshold | Threshold Relative to ITP Limit | Avoidance and Minimization Measures[1] |
|---|---|---|---|
| 4 | At any point during Project operation the level of take, estimated and incidental, exceeds 75 murrelets. | Depending on when this occurs in the permit term, take is likely to be on a trajectory to exceed the 30-year permit threshold | • Consult with USFWS regarding actions necessary to avoid unauthorized take until authorization of additional take has been achieved. |

[1] Each tier incorporates the preceding avoidance and minimization measures. Example: Tier 3 includes the reevaluation of the curtailment program, an additional year of Evaluation Phase monitoring, in addition to avoidance and minimization measures discussed in Tiers 1 and 2.

*Golden and Bald Eagles*

As discussed above, the Applicant is applying for an ITP for golden and bald eagles. In coordination with USFWS, WDFW, and Lewis and Thurston counties' critical areas ordinances, avoidance, minimization, and mitigation measures will be incorporated into the Project. These include:

- In 2017 the Applicant reduced the Project to 38 WTGs, further minimizing Project impacts to wildlife, including the golden eagle, and bald eagle.
- In response to the Tier 3 surveys, the Applicant removed the two WTG locations nearest to Skookumchuck Reservoir. The eagle use surveys indicated higher eagle use in the vicinity of these two WTGs in comparison to the rest of the Project. Throughout this time, the Applicant continued to coordinate with the USFWS and WDFW with respect to potential impacts to murrelets and bald and golden eagles.
- Maximizing use of previously disturbed areas (i.e., agricultural lands, timberland) and avoiding native habitats for facility locations as practicable.
- Utilizing existing roads, where feasible.
- Minimizing length and number of road and collection lines as practicable.
- Using underground low-voltage collector lines to the extent possible to reduce eagle collision and electrocution risk associated with above ground lines.
- Following the APLIC (2006) guidance on power line design to minimize risk of electrocution.

Avoidance and minimization measures that will be implemented during operations include:

- Implementing a mammal carrion reporting program in which carrion detected incidentally during operations or maintenance activities onsite near WTGs is reported for removal.
- Instructing operating staff to recognize and report eagles, if present onsite.
- Establishing a 25-mph speed limit for operations staff on Project roads to minimize the risk of eagle collisions.
- Avoiding storage of materials and equipment near WTGs that could provide cover for rabbits or other potential eagle prey (e.g., rock piles, pipes, etc.).
- The Applicant will minimize potential impacts of take of eagles from operation of the Project by implementing a machine vision technology called IdentiFlight® to curtail turbines when eagles are at risk. Currently, two IdentiFlight® towers are planned for the Project. While this provides additional minimization for potential take of eagles, the requested take estimate has not been reduced based on this minimization effort because the technology has not been accepted by the USFWS. Mitigation for take of eagles has been proposed based on unminimized estimates. The IdentiFlight® technology will undergo up to two years of testing at the facility. Each IdentiFlight® tower consists of a ring of eight fixed, wide field of view (WFOV) cameras and one set of two movable high resolution stereo cameras (HRSC) mounted on a tower. The WFOV cameras and lenses are designed to register an eagle-sized object up to 1,000 meters away. IdentiFlight's® technology determines motion that is of interest by comparing subsequent frames and ignoring objects not of interest, such as turbine rotors and clouds. Once an object is detected, IdentiFlight® directs the HRSC to point at the object to determine distance to the object and

gather data to determine if the object is an eagle or not an eagle. Each IdentiFlight® tower produces a large amount of data (1 gigabyte of data per second, with frame rates from 200 to 300 milliseconds per frame) that provides an opportunity for data analysis and interpretation.

- The Applicant is working to partner with a utility to identify high-risk poles and implement power pole retrofits. The Applicant and the utility will conduct the risk assessment for at-risk poles within the selected utility's service territory for future pole modifications. The risk assessment will examine the overlay of eagle use areas, applicable habitats, and power lines to identify applicable mitigation areas, starting with a desktop analysis and verification in the field. These results, in conjunction with PSE engineering and management input, would determine the best geographic locations for the pole modifications and whether existing poles would be retrofitted, reframed, or rebuilt, and how best the mitigation dollars would be applied. Data recorded during the field risk assessment would include:
    - Pole identification number
    - Global Positioning System (GPS) waypoint and photo numbers
    - Pole configuration
    - Existing equipment and number of exposed jumper wires
    - Grounding practices on each structure
    - Suggested retrofits, if applicable
    - Any existing bird fatalities or signs of bird use
    - Common habitats and human-use influences
    - Overall habitat value for eagles
    - Topography of pole
    - Priority ranking.

*Monitoring Program*

- A monitoring program will be implemented to verify permit compliance through evaluation of the level of take of the covered species (murrelet, golden eagle and bald eagle), to provide progress reports on the fulfillment of mitigation requirements, and to enable evaluation of the effectiveness of the minimization and mitigation actions in meeting the biological goals and objectives. The monitoring program consists of mitigation effectiveness monitoring to ensure that the mitigation projects are implemented and functioning as planned and that compliance monitoring to evaluate the level of take of the covered species at the Project is conducted. Monitoring will provide a feedback loop into the decision-making process that will help inform adaptive management decisions. Monitoring results will be reported annually to the USFWS.
- The compliance monitoring program that will be implemented will provide the information necessary to assess Project impacts. Based on information derived from monitoring, adaptive management will be used to make modifications to the proposed minimization and mitigation measures.
- Take compliance monitoring will be conducted in three phases: Evaluation Phase, Implementation Phase, and Re-evaluation Phase. In all phases, fatality monitoring will be conducted to determine the number of carcasses detected. As part of the fatality monitoring,

the area available to be searched will be mapped, and searcher efficiency and carcass persistence will be measured with field trials. At the end of each year of fatality monitoring, a report will be developed that presents the estimated number of fatalities. Specific details of the fatality monitoring plan are discussed further below.

- Evaluation Phase – The Evaluation Phase is the most intensive phase of monitoring. Because the quantification of the risk to the covered species and the effectiveness of minimization measures have some degree of uncertainty, monitoring will be most during years 1, 2, and 3 of Project operation. A key aspect of Evaluation Phase monitoring is that 100 percent of turbines will be searched each year.
- The application of radar monitoring during project operation has been addressed and is included as an Adaptive Management strategy (see Appendix 3.4-5, Table 32). In addition, during the first year of the project, radar monitoring will be conducted to further evaluate the use of murrelets at the Project. Radar monitoring will be conducted from July 1 to August 9 from 105 minutes before sunrise to 75 minutes after sunrise. Additional radar monitoring will be considered as needed in accordance with the adaptive management framework described in 3.4.6.3 to further evaluate peak activity times.
- Implementation Phase – After completion of three years of Evaluation Phase mortality monitoring, provided adaptive management measures are not implemented, the Applicant will implement Implementation Phase monitoring using the Evaluation Phase monitoring plan during years 7, 15, 22, and 30 of Project operations. However, if it is determined the Applicant is in compliance with Project permit requirements during the Implementation Phase monitoring, a stepped-down approach to monitoring may be adopted and will depend on the estimated take and attributes of the monitoring program. The Implementation Phase will remain as outlined above for the remainder of the operational life of the Project unless a short-term or long-term adaptive management trigger is reached during the operational life of the Project.
- Re-Evaluation Phase – If a short-term or long-term adaptive management trigger is met, operational changes will be considered as needed in accordance with the adaptive management, and one year of Re-evaluation Phase monitoring will be conducted following the operational change to confirm the altered operational adjustment protocol's effectiveness at reducing eagle or murrelet mortality to a level sufficient to maintain annual take of the covered species below the estimated level. The level of effort in monitoring would be the same intensity as the Evaluation Phase. After a year of Re-evaluation Phase monitoring, the Applicant will return to conducting the Implementation Phase monitoring.

**Energy and Natural Resources**

***Construction and Decommissioning***

- During construction and decommissioning, BMPs will include construction waste recycling when possible, and carpooling will be encouraged to reduce consumption of refined petroleum products and their resulting emissions.
- The Applicant will obtain necessary approvals from BPA, Olympic Pipeline, Northwest Pipeline, LLC, and others as necessary, for gen-tie line crossings of transmission lines and pipelines before construction permits are issued.

***Operation***

Operations BMPs will be developed that include conservation measures for nonrenewable resources such as water, fuel, and electricity. These BMPs may include the following conservation measures when cost effective:

- Installation of high-efficiency electrical fixtures, appliances, and light bulbs in the O&M Facility
- Use of low-water flush toilets in the O&M Facility
- Encouraging carpooling among operations workers
- Recycling of waste office paper and aluminum will be encouraged.

**Health and Safety**

The Project will comply with all applicable local, state, and federal safety, health ordinances, regulations, and standards, as well as any required plans and BMPs. The following mitigation measures will be implemented to reduce impacts to public health and safety resulting from construction, operations, and decommissioning the Project. The Applicant will develop a Project Health and Safety Plan (HSP) prior to construction for all phases of the Project. The HSP will be implemented to manage and control safety risks, as well as guide responses in the case of emergency situations at the Project. Access to emergency medical and fire services is important to mitigate any impacts from potential health and safety issues.

***Construction and Decommissioning***

- A number of design standards have been developed for WTGs which address occupational health and safety elements. These include standards of the American Society of Mechanical Engineers, the American National Standards Institute, the American Society of Testing and Materials, the NFPA, the American Gear Manufacturer's Association, and the Institute of Electrical and Electronics Engineers. The Project will be designed in accordance with applicable standards, some of which directly or indirectly address occupational health and safety concerns. The O&M Facility and the buildings located at the Project substation will be designed and constructed in accordance with local building and fire codes (Title 14, Buildings and Construction, of the TCC and Title 15, Buildings and Construction, of the LCC, respectively).

*Fire and Explosion*

- The Project falls outside of fire districts in Thurston County but a portion of the study area falls within the Thurston 911 Communications dispatch area of the Southeast Thurston Regional Fire Authority (Thurston County Regional Planning Council 2017). This information will be submitted to Lewis and Thurston counties prior to issuance of building permits as part of the Project's Emergency Response Plan (ERP). A draft of the ERP is attached as Appendix 3.6-1 and will be finalized prior to the start of construction with consultation with local service providers. This plan will outline potential fire and explosion risks during construction, operation, and decommissioning of the Project, will identify the assignments of key personnel in the event of a fire and provide an evacuation plan for workers on the wind turbines. Development and implementation of this plan will minimize the potential for significant impacts that Project construction, operations, and decommissioning will have on public safety.

- The Applicant will provide all police, fire districts, and emergency medical personnel with emergency response details for the Project including detailed maps of access roads surrounding the Project site, and keys to the master lock systems to enable emergency personnel with access to the site.
- Fire and emergency procedures as part of the Project's Weyerhaeuser lease will be implemented. These procedures include that the Applicant conducts fire safety training for all construction employees and contractors. All construction equipment (e.g., cutting torches and cutting tools) will use spark arresters and require construction shut-downs when extreme fire danger conditions persist. Fire suppressant equipment will be maintained within the Project Area, and the Applicant will provide additional water supply for firefighting locations beyond the contracted fire districts. WTGs will be designed and maintained to protect against fire danger. All operations will follow the appropriate IFPL designated by DNR.

**Weyerhaeuser Lease Emergency Procedure Provisions**

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| **SAFETY REQUIREMENTS** | • The Applicant will coordinate entry of vehicles into the Project Area with Weyerhaeuser's travel standards (e.g. use of CB radios, use of escorts, etc.) whenever Weyerhaeuser's logging operations are underway along the designated travel routes.<br>• The designated speed limit for all vehicles operating on private Project access roads will not exceed 25 mph.<br>• During construction and operation the Applicant will provide travel coordination for all construction and operational vehicles including, but not limited to, installation of directional signs, road designation, radio communication, escorts, and flaggers as needed to coordinate with Weyerhaeuser's timberland operations.<br>• Applicant's employees, contractors, sub-contractors, and visitors will comply with all of Weyerhaeuser's and RES safety rules including, but not limited to, wearing safety helmets, vests, CB communications, etc.<br>• No firearms are allowed on Project site at any time.<br>• Comply with all safety laws and regulations.<br>• Safety belts will be worn while driving at the Project site and while operating equipment. Safety belts will be worn by all employees, contractors, subcontractors, business visitors, and vendors. |
| **SECURITY/GATES** | • Applicant will prepare a security plan for the Project site during construction and prior to beginning operations. Contact information for emergency responders will be included in the plan and emergency providers will be provided keys for secured entry locations to the Project site.<br>• All Wind Turbine access doors and other facilities shall be locked or have available locks and gates to be used as necessary to secure equipment and facilities. |
| **FIRE/EMERGENCY PROCEDURES.** | • The Applicant has developed an Emergency Response Plan (ERP) that includes Fire Prevention for the construction phase of the Project. The Applicant will update this plan to address the operations phase prior to the |

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| | beginning of Project operation. The Applicant will coordinate with local emergency responders during the development of the construction and operations ERPs.<br>• The Applicant will conduct construction activities and Project operations in compliance with the State fire protection laws and general "fire safe" practices established by Weyerhaeuser. The Applicant, and its contractors, subcontractors, vendors, and visitors will be subject to restrictions under the appropriate Industrial Fire Precaution Levels established by the Washington Department of Natural Resources (DNR).<br>• The ERP will include, but not be limited to, Applicant's fire prevention measures, employee training, equipment, fire response plans, and emergency communication and evacuation procedures. The plans will identify the Applicant's operation restrictions under all Industrial Fire Precaution Levels for both construction and operations periods for the Project Improvements.<br>• The Applicant will maintain fire suppression equipment on site including but not limited to: fire suppression trucks, equipped to meet DNR Industrial/Forest Lands rules and regulations, appropriate hand tools and firefighting equipment as recommended or required by the DNR's IFPL rules and regulations and Weyerhaeuser's fire plan.<br>• In consultation with Weyerhaeuser and local emergency responders the Applicant will select and provide an emergency helicopter evacuation site at or near the Project site for responding to Project-related emergencies.<br>• All Wind Turbines will be designed and maintained to protect against fire danger from lightning strikes, power surges, and equipment malfunctions including but not limited to adequate grounding, earth termination systems, shielding measures, fire extinguishers and automated fire suppression equipment for all Project Improvements.<br>• All equipment will be equipped with adequate mufflers and spark arrestors and will be parked only in designated areas. During commercial operations all equipment and vehicle parking areas will be maintained to reduce the danger of fire from such risks as combustible materials, sparks, etc. and Applicant will implement Best Management Practices for appropriate Fire Precaution Levels.<br>• All operations will follow the appropriate Industrial Fire Precaution Levels designated by DNR. Applicant will institute Best Management Practices for all Industrial Fire Precaution Levels.<br>• Smoking will not be allowed on the Lease Area, access roads, or within any of Applicant's operations on or adjacent to the Property.<br>• Open fires of any kind are prohibited on the Property during the fire season as declared by DNR.<br>• All of Applicant's operational crews will be trained in forest fire prevention and suppression. |

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| | • All of Applicant's operational crews, vendors, suppliers, and visitors will stay on designated travel routes and parking shall occur only in designated areas.<br>• During the construction of the Project, all equipment operators will be limited to designated areas, all clearing and grubbing operations will be in accordance with DNR fire codes and Industrial Fire Precaution Level regulations. If so ordered by DNR, all such activities will be curtailed to comply with DNR directives under Industrial Fire Precaution Level IV conditions. Applicant will have the right to seek a waiver from DNR for continued Wind Turbine operations after the Commercial Operations Date, provided Applicant can demonstrate to Weyerhaeuser's satisfaction that such commercial operations do not create increased fire ignition risk.<br>• Any welding, cutting, or similar activities will take place only in appropriate designated areas in accordance with DNR rules and regulations for the IFPL establish by DNR. |

- For blasting activities, a geotechnical specialist will help locate bedrock and determine the appropriate foundation design for each WTG location. The contractor will prepare and enforce safety training and protocols prior to commencing work that will address prevention methods for rock or blast debris fly, controlled access to the blasting site during loading and blasting, resident and construction worker blast notification methods, and blasting materials storage. Blasting activities will be conducted by professionally trained and certified explosive experts and will employ industry-standard techniques. Blasting hazards will be managed onsite; therefore, the public, recreationists, and Weyerhaeuser employees near the study area will not be exposed.

*Gen-Tie Line*

- The Applicant will clear and maintain a corridor that satisfies regulatory safety thresholds for clearance to trees and other ignitable sources. The gen-tie corridor will be cleared and maintained to a 75-foot minimum cleared area from centerline, 150-foot total width, which will be regularly monitored. If a conductor does come in contact with the ground through failure, Project operational staff will respond immediately to mitigate the situation. Operational staff will be trained and comply with a fire safety plan for both the WTG nacelles and the gen-tie line.

*Electrical Hazards*

- To prevent electrocution by a human-caused accident or error during construction and decommissioning of the Project, all electrical components and infrastructure will be installed by qualified professionals in accordance with applicable standards and regulations. Additional safety precautions include vegetation clearing to avoid contact with collection and interconnection lines, restrict road and site access, and map and mark location of buried collection system lines. Safety training will be provided to all construction workers. Required safety equipment will include approved safety gear, clothing, and grounding equipment. To prevent electrocution as a result of unauthorized activities, construction site access will be restricted by gated and locked private access roads, substation yards, and access to the WTGs will be well secured.

*Hazardous Materials*

- Implementation of appropriate spill prevention and control measures will ensure that the risk of an accidental release of hazardous materials remains low throughout construction and decommissioning of the Project. The Applicant will develop and implement an SPCC Plan in accordance with applicable local, state, and federal requirements prior to commencing construction. The plan will include provisions for monitoring petroleum leaks from vehicles and construction equipment and protocols for spill reporting and proper cleaning, storage, and disposal of potential spills. Some examples of standard SPCC provisions for the handling of hazardous material include:

    - Oil product storage areas will be established at the site lay-down yards. Aboveground storage tanks will be positioned in such a way that the aboveground storage tank is protected from impact or rupture using berms or barriers. Gravity fed tanks will not be used.
    - Store and maintain equipment in a designated area, as appropriate.
    - Use secondary containment (drip pan) to catch spills when removing or changing fluids.
    - Use proper equipment (pumps, funnels) to transfer fluids.
    - Keep spill response materials readily available and properly stocked.
    - Transfer used/waste oils to designated recycling containers.
    - Equipment inspections for leaks and spills.
    - Immediate shut down and repair, if needed.
    - Preventative maintenance for equipment.
    - Low-level indicators and alarms on hydraulic equipment.
    - Prompt correction of visible discharges.
    - Prompt removal, clean-up, and disposal of oil in secondary containment, according to state or federal requirements.
    - Initial “awareness” training will be used to train all personnel during site orientation. Employees who handle oil products, conduct equipment maintenance, or operate construction vehicles or equipment at the site will receive additional training.

*Worker Falls from WTGs*

- Construction workers are required to work at extreme heights when installing WTGs. The Applicant will develop a detailed fall protection plan for the site to control fall hazards from WTGs during construction. The plan will outline appropriate safety protection equipment including anchorage structures, body supports (harnesses), rescue devices such as baskets, and crew composition including persons trained in rescues at height. Rescue baskets will be stored at the O&M Facility for the purposes of removing injured employees from WTGs in emergency situations. Provisions for special training for emergency medical services personnel in the use of rescue baskets will be provided by the Applicant. Detailed maps showing all access roads to the Project and keys to locked access gates will be provided to fire districts.

*Machinery Hazards*

- The use of cranes, derricks, and hoists during WTG installation will be performed in accordance with applicable OSHA regulations (29 CFR 1910.179- 1910.181) for safe use and maintenance of the equipment and appropriate training of employees. This equipment will be inspected before use and operated according to the manufacturer's instructions. The proper clearance distance from power lines will be maintained at all times so the crane boom, load line, or load itself does not contact nearby power lines. In addition, all rotating parts and points of operation for construction equipment or other machinery associated with the turbine (such as gears and blades), will be properly guarded prior to using them in accordance with OSHA regulations for machine guarding (29 CFR 1910 Subpart O).

*Confined Spaces*

- WTG nacelles are considered confined spaces, and some hazards may be severe enough to classify them as PRCS, as well. In accordance with OSHA safety regulations for PRCS use and access, if workers are expected to enter a PRCS, the employer will develop a written PRCS program and make it available to workers. The program will detail the steps to be taken to make the space safe for entry.

*Recreation Activity*

- Construction site access will be restricted by gated and locked private access roads, substation yards, and access to the WTGs will be well secured from the general public. The Applicant will develop and implement a construction site access plan in coordination with Weyerhaeuser to prevent injury to Project construction workers as a result of recreation activities such as hunting, and vice versa, to prevent injury to permit holders as a result of Project construction activities. The plan will identify areas that are temporarily closed to recreation activity due to construction of the Project.

***Operations***

- Mitigation measures described above for construction and decommissioning the Project also apply to the operations of the Project. Additional mitigation measures proposed are described below. The Project will comply with all applicable setback requirements, as adequate setbacks are an important factor in minimizing safety concerns for potential ice throw, WTG tower collapse, blade throw, and EMFs. The Applicant's operational staff will be available 24 hours a day, 7 days a week for any emergency related to the Project operations and components.

*Fire and Explosion*

- During operations, fires can be caused by mechanical failure in WTG nacelles. Based on industry review by Caithness Windfarm Information Forum, between 2005 and 2012, there was on average a maximum of 11.7 fires per year; note that this is out of the 225,000 wind turbines installed globally at the time of the review, meaning that you could expect there to be one fire a year for every 19,230 turbines operating worldwide, on average (GWEC 2018). WTGs have built-in fire protection features that monitor nacelle temperatures. The WTG control system will monitor nacelle temperatures and automatically shut the WTG down and send an alarm to the

control room if temperatures are exceeded. In addition to the monitoring system, a fire suppression system in the nacelle will be incorporated into each WTG and each WTG will be equipped with a fire extinguisher. In addition, WTGs will be equipped with quick escape descent devices for workers to escape in the event of a fire or other emergency.

- In conjunction with Weyerhaeuser, the Applicant will comply with all fire regulations or elevated risks. Weyerhaeuser has an emergency response plan in place and strictly regulates activities and access during periods of level 1-4 fire risk. During such periods, both the Applicant and Weyerhaeuser will have trained staff, fire suppression equipment, and water tanks available.

- The Applicant and Lewis County are continuing discussions with local fire agencies to ensure that response plans are in place prior to construction. Prior to construction, the Applicant shall submit to the County such fire response plans, completed with local fire agencies, with confirmation of concurrence with such plans.

- In addition, fire breaks will be a design feature. Each road will be considered a site fire break, and each WTG location will have an area of up to 6.75 acres cleared, free of timber and brush overgrowth, to aid in protection against fire dangers. All construction and operations staff will be trained in fire prevention awareness, and trained personnel will be able to handle minor fire suppression tasks. The Applicant will provide any special training to fire district personnel and DNR for fires related to WTGs. The Applicant will develop and implement an ERP, which will outline potential fire and explosion risks during construction, operation, and decommissioning of the Project, will identify the assignments of key personnel in the event of a fire and provide an evacuation plan for workers on the wind turbines. A draft of the ERP is attached as Appendix 3.6-1 and will be finalized prior to the start of construction with consultation with local service providers.

- Comprehensive lightning and surge protection measures are required to reduce damage and resulting repairs (Dehn and Sohne 2015). WTGs and the substation will be equipped with lightning protection systems. Each WTG has lightning protection measures incorporated to reduce the potential for lightning-related fires. To reduce damage caused by lightning strikes, each WTG, including rotor blades, will be connected to a grounding grid surrounding the WTG foundation. In the event of a lightning strike, the grounding grid will facilitate the flow of lightning energy safely to the ground and will not affect the WTG or the surroundings.

- Implementing practices from the NFPA of Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations will be put to practice to reduce the risk of WTG fires and explosions from natural phenomenon, human, electrical, and mechanical errors. The HSP will incorporate fire safety planning to ensure that fire safety planning is incorporated into the design, construction, and operation of all facilities. Industry standard clearance distances will be maintained between vegetation and electrified Project elements which may cause fire, for example gen-tie line conductors and substation components.

- In conjunction with Weyerhaeuser, the Applicant will comply with all fire regulations or elevated risks. Weyerhaeuser has an emergency response plan in place and strictly regulates activities and access during periods of level 1-4 fire risk. During such periods, both the Applicant and Weyerhaeuser will have trained staff, fire suppression equipment, and water tanks available.

*Electrical Hazards*

- WTGs will be equipped with a lightning protection system in order to minimize damages on mechanical components, electrical systems, and control systems. This standard lightning protection provides a high protection level and continue to be improved upon as technology changes.
- In addition to mitigation measures for electrical shock hazards discussed for construction and decommissioning, site access will be restricted to the public by gated and locked private access roads, substation yards, and access to the WTGs will be well secured.
- The World Health Organization's International EMF Project was launched to provide scientifically sound and objective answers to public concerns about possible hazards of low level EMFs. Despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health. However, research is ongoing – if EMFs do have an effect on cancer, then any increase in risk will be extremely small. The results to date contain many inconsistencies, but no large increases in risk have been found for any cancer in children or adults (WHO 2017). Therefore, no other mitigation measures are proposed.

*Hazardous Materials*

- The Applicant will develop and implement an Operations SPCC Plan in accordance with local, state, and federal requirements. The SPCC will be renewed every five years. Any hazardous waste material generated by Project operation will be disposed of in a manner specified by local and state regulations or by the manufacturer.
- The Applicant will submit a complete list of hazardous materials stored at the O&M Facility. Any drums used for storing gear and hydraulic oil will be sealed by a certified waste contractor.
- Measures incorporated into the design of the O&M Facility will ensure that the risk of accidental spill or release of hazardous materials at the O&M Facility will be low and will not be a risk to health and safety or the environment. Any spilled or released hazardous materials will be contained inside a secondary container and not released to the environment per TCC Article VI. The Project operator will be required to notify the Department of Ecology immediately of any spills of hazardous substances to help ensure an appropriate and immediate response.
- Employees will be trained in the proper use of respiratory personal protective equipment, including proper storage and maintenance, to be implemented during maintenance activities that could generate harmful gases, vapors, or dusts.

*Mechanical Hazards*

- WTGs will meet international design and manufacturing safety standards and will be certified by a professional engineer. Quality control inspections will be conducted according to industry standard practices to ensure proper functioning of all WTGs. The WTGs will include several inherent safety features that reduce the possibility of health and safety risks, such as rotor and overspeed controls. WTGs will be shut down at the manufacturer's recommended maximum wind speeds to avoid structural damage. A communication and control system for monitoring and controlling the WTGs will use fiber-optic communication lines that run parallel to the power collection system cables. Each WTG will be equipped with a rotor control and braking system,

which will respond automatically to the set controller conditions for cut-out speeds and could be operated by the control center in the O&M Facility.

- In general, operations personnel working on the WTGs will work in pairs. In the unlikely event that an injury occurs while working in the nacelle, all staff and local emergency medical services personnel will be trained in lowering injured individuals from the nacelle using a specially-designed rescue basket. The rescue basket will be kept onsite at the O&M Facility and will be available for use by local emergency medical services personnel.
- Signs and gates will be posted to prevent trespassing. Access to the WTGs will be through restricted access roads and will not be open for public use.

*Ice Throw*

- Potential impacts to the public associated with the risk from ice throw will be minimized through adherence to setback requirements. WTGs will be built within the applicable property line setbacks, regulated by Lewis County to minimize the risk of injury in the event of ice throw. Potential impacts to operations personnel will be minimized by training staff to recognize icing conditions and implement specific safety protocols should work near WTGs occur while these conditions exist. While ice remains on the WTG structures, access to turbines by site personnel will be restricted based on manufacturer's recommendations. WTGs will be equipped to remotely switch off when site personnel detect ice accumulation.
- Signs and gates will be posted to prevent trespassing by the public recreating in the area. Site access will be restricted by gated and locked private access roads, and access to the WTGs will be well secured.

*Worker Falls from Towers*

- Maintenance workers will be required to work at extreme heights on WTG towers. The Applicant will develop a detailed fall protection plan to control fall hazards from WTG towers. The plan will outline appropriate safety protection equipment including anchorage structures, body supports (harnesses), rescue devices such as baskets, baskets, and crew composition including persons trained in rescues at height.
- In addition, fixed ladder systems within the WTGs that provide access to the nacelle will be equipped with fall arrest systems such as cages, wells, and landing platforms as required by OSHA regulations (29 CFR 1910.21 through 1910.30). Rescue baskets will be stored at the O&M Facility for the purposes of removing injured employees from WTG towers in emergency situations.
- The Applicant will require tower inspections to take place on a regular basis to ensure tower structural integrity and worker safety. Provisions for special training for emergency medical services personnel in the use of rescue baskets will be provided by the Applicant. Detailed maps showing all access roads to the Project and keys to locked access gates will be provided to fire districts.

*Machinery Hazards*

- The use of cranes, derricks, and hoists during WTG maintenance activities will be performed in accordance with applicable OSHA regulations (29 CFR 1910.179- 1910.181) for safe use and

maintenance of the equipment and appropriate training of employees. This equipment will be inspected before use and operated according to the manufacturer's instructions. The proper clearance distance from power lines will be maintained at all times so the crane boom, load line, or load itself does not contact nearby power lines. In addition, all rotating parts and points of operation for construction equipment of other machinery associated with the turbine (such as gears and blades), will be properly guarded prior to using them in accordance with OSHA regulations for machine guarding (29 CFR 1910 Subpart O).

*Confined Spaces*

- WTG nacelles are considered confined spaces, and some hazards may be severe enough to classify them as PRCS as well. In accordance with OSHA safety regulations for PRCS use and access, if workers are expected to enter a PRCS, the employer will develop a written PRCS program and make it available to workers. The program will detail the steps to be taken to make the space safe for entry.

Recreation Activity

- Site access will be restricted by gated and locked private access roads, substation yards, and access inside the WTGs will be well secured from the public. Following construction, access to recreational uses will be reopened to Weyerhaeuser recreational permit holders. Weyerhaeuser will continue to implement its requirements for safe access and recreation practices on its lands (Weyerhaeuser 2017), modified as needed to address Project operation and safety. The Applicant will develop and implement an operations site access plan in coordination with Weyerhaeuser to inform recreation permit holders and Weyerhaeuser staff of potential Project hazards, safety measures that permit holder and staff must respect, and activities which are prohibited near Project facilities.

**Noise**

The Project will comply with all applicable local, state, and federal laws, ordinances, regulations, and standards. Although no specific receivers are identified as being impacted by construction, decommissioning, or operational noise at this time, the following practices are recommended to minimize the effects of construction noise in the Project area:

- Implement construction and maintenance work-hour controls so that most noise- generating activities occur between 7:00 AM and 6:00 PM, which will reduce the impact during sensitive nighttime hours
- Minimize the number of heavy-duty haul trucks traveling through the area during nighttime hours
- Maintain equipment in good working order and use adequate mufflers and engine enclosures to reduce equipment noise during operation
- Limit vehicle idling
- Use the quietest available construction equipment and techniques

**Land Use and Recreation**

***Construction and Decommissioning***

- The Applicant will develop and implement a Construction Traffic Management Plan (CTMP) to coordinate construction activities to minimize impacts to public and private road traffic resulting from construction of the Project. The Applicant will also coordinate construction activities with the owners and operators of nearby commercial forestry lands to minimize impacts to their activities during construction of the WTGs and associated facilities in the Project lease area and within the private lands where the gen-tie line will be located. Coordination activities will also be conducted with Lewis County to minimize traffic impacts resulting from construction of the gen-tie line across public right-of-way near the interconnect at Tono substation. The Applicant will obtain a Lewis County franchise agreement for aerial crossings of Big Hanaford Road by the gen-tie-line.
- The Applicant will conduct construction activities in shoreline jurisdictional areas in accordance with the SSDPs and SCUPs issued by Lewis County and Thurston County.
- With respect to recreational use on private Weyerhaeuser Company lands, as described in Section 3.6.6.1 the Applicant will work with Weyerhaeuser to implement mitigation measures to prevent injury to permit holders as a result of construction activities. The Applicant will develop and implement a construction Site Access Plan in coordination with Weyerhaeuser to identify areas which are closed due to construction activity and communicate such closures to permit holders.
- At the end of the Project lifetime, Project facilities will be removed as described in Section 2.8. At that time, areas which were in commercial forestry prior to construction of the Project will be available for re-planting and ongoing timber management and harvesting. The O&M Facility will also be demolished, making the underlying parcel available for other uses allowed in RRR 1/5 zoning district.
- After construction is complete, temporarily disturbed areas will be returned to their previous use. Commercial forestry activities will resume as described in Section 2.7.

***Operation***

- The Applicant will collaborate with Weyerhaeuser to develop a timber harvest plan to maximize ongoing commercial forestry activities temporarily impacted by Project implementation in Lewis County.
- Following construction, access to recreational uses will be re-opened in locations managed by Weyerhaeuser. Weyerhaeuser will continue to implement its requirements for safe access and recreation practices on its lands (Weyerhaeuser 2017b), modified as needed to address Project operation and safety. As described in Section 3.6.5.2, site access to the O&M Facility and substation yards will be restricted by locked gates to protect safety of the public; access inside the WTGs will also be secured from the general public.

**Visual**

***Design, Construction, and Decommissioning***

Visual impacts will be minimized during the Project design process by implementing the following:

- To the extent consistent with FAA guidelines, use low reflectivity, neutral color finishes for the WTGs and other Project components, to minimize contrast with the sky backdrop and to minimize the reflections that can call attention to structures in the landscape
- The WTG towers, nacelles, and rotors will be uniform in design throughout the Project Area
- Restrict exterior lighting on the WTGs to the aviation warning lights required by the FAA, which will be kept to the minimum required number and intensity while still complying with FAA standards
- Use of carefully selected earth-tone, non-reflective finishes, whenever possible, for the O&M Facility to maximize visual integration into the surrounding landscape
- All insulators in the substation will be non-reflective and non-refractive.

BMPs will be incorporated into the construction and decommissioning practices to minimize adverse visual impacts as follows:

- During the construction period, active dust suppression will be implemented to minimize the creation of dust clouds
- When construction is complete, areas disturbed during the construction process will be restored to conditions specified in the Applicant's Temporary Construction Restoration Plan
- Existing roads will be used as much as possible to access WTGs.

**Operation**

- Restrict outdoor night lighting at the substation and O&M Facility to the minimum required for safety and security. Sensors and switches will be used to keep lighting turned off when not required, and all lights will be hooded and directed to minimize backscatter and offsite light trespass.

**Cultural Resources**

***Construction and Decommissioning***

The following mitigation measures proposed by the Applicant will reduce or avoid effects on cultural resources:

Avoidance of Identified Cultural Resources:

- Due to the overall poor surface visibility across some of the study area, archaeological monitoring for vegetation and ground-disturbing Project activity will be conducted in areas defined as sensitive for cultural resources based on the results of the survey and High Probability Area modeling. The areas within the study area that have been subject to recent logging activity represent larger percentages of testable ground surface, but the logging slash

created safety hazards and limited access during the survey. In the event that the large logging slash deposits in these areas are cleared for Project actions, a qualified archaeologist will be present to monitor clearing activities and conduct surveys for high probability areas that become accessible.

- At the two sites (Site-1 and Site-2) that have been identified as potential resources, site delineations were conducted within the Project footprint until negative shovel-test probes were achieved and a site boundary was established. Outside of the Project footprint, the two sites could not be fully investigated because they were located in heavily vegetated areas will be avoided. The one isolate identified during pedestrian surveys will also be avoided.
- During ground clearing activity, a qualified archeological professional will mark the precise boundaries of the resource for avoidance, including any required buffer. All site locations will remain confidential. This site is recommended not-eligible for NRHP under any criteria.

Construction Training and Monitoring:

- A cultural resources sensitivity training for personnel working on Project construction will be conducted. The purpose of this training will be to instruct Project personnel on the sensitivity of cultural resources in the Project area, protocols for stopping work and notification in the event of findings, and to provide an overview of the laws that govern cultural resources, as well as to introduce them to the Tribe's perspective on potential impacts. Individuals from potentially affected tribes will be invited to contribute to this training.
- A qualified cultural resources archaeologist will monitor vegetation clearing and ground-disturbing decommissioning activities that go beyond the previously disturbed areas during construction. If cultural resources are uncovered during decommissioning, work shall halt until a qualified archaeologist can determine the significance of the find, as described per the Unanticipated Discovery Plan (UDP).

Treatment of Unanticipated Discoveries:

- A UDP will be developed and reviewed by the County, DAHP, and any affected tribes prior to beginning of construction activities and will be implemented during construction and decommissioning of the Project. If archaeological deposits are encountered during - construction, the provisions of the UDP shall be followed.
- If any previously unidentified cultural resources are encountered during construction, all work activities shall cease in the immediate vicinity of the site until a qualified archeologist can assess the find and consult with the DAHP to identify appropriate mitigation measures such as avoidance or scientific data recovery. No further construction activities will occur within the vicinity of the discovery until a qualified archaeologist, in concert with tribal representatives and local and state agency representatives, is able to evaluate the significance of the find.
- Should human remains be discovered during Project activities, all work within 200 feet shall stop. Additionally, the Washington State DAHP (360-586-3065), the Thurston or Lewis County's planning office (depending on which county the discovery was made), the affected Tribes, and the respective county coroner (if human remains are uncovered) shall be contacted within 24 hours to help assess the situation and determine how to preserve the resource(s) (Chapters 27.44, 68.50, and 68.60 RCW).

- If human remains are determined to be associated with an archaeological site, the DAHP and any affected Tribes shall be notified. Appropriate measures will be taken to ensure the site is protected from further disturbance until a treatment plan is agreed upon by all involved parties.
- Compliance with all applicable laws pertaining to archaeological resources will be observed and permits obtained (RCW 27.53 and 27.44 and WAC 25-48) as required.

***Operation***

Project operations are not expected to require excavation or ground disturbance in areas which have not been previously disturbed. Mitigation measures discussed above for construction and decommissioning will be followed in the event of inadvertent discovery of cultural resources during operations. Project operations are not expected to result in adverse impacts.

**Transportation**

***Construction and Decommissioning***

- Prior to beginning construction, the Applicant will finalize access road designs and will develop and implement a Construction Traffic Management Plan (CTMP). The CTMP will identify the various access requirements and restrictions to address potential impacts to private and public roads and traffic during the construction phase. More detailed documentation, although identified in the CTMP, may be submitted under separate cover, e.g., haul road agreements. The Applicant will coordinate review of the CTMP with local and state agencies to ensure their transportation related concerns and review and approval processes are addressed. The following main elements will be addressed in the CTMP and supplemented as needed to address jurisdiction-specific requirements.
    - Design standards for establishing access to public roads
    - Identification of primary and secondary roads to be used for construction site deliveries and access, and return trips from the Project
    - Identification of major laydown and delivery truck queuing areas
    - Identification of Project staff and construction contractor parking locations
    - Haul route agreements negotiated with local governments
    - Time, location, and nature of temporary road closures affecting public use of right-of-way to minimize traffic disruptions
    - General construction traffic management activities to minimize traffic impacts and maintain traffic safety
    - Location-specific traffic management activities for higher risk locations
    - For large component deliveries: haul routes, delivery schedule, specific traffic management controls, location of temporary road modifications, and site-specific mitigation activities
    - Methods of notice to public and affected agencies of temporary road closures
    - Coordination activities with private landowners where access is shared with the Applicant
    - Emergency response access routes and coordinated means for approach with emergency responders

- Permits for overweight and oversize loads (local and state as applicable)
- Permits for temporary access to public roads not usually permitted (e.g., travel in wrong lane, temporary traffic channelization, etc.) (local and state as applicable)
- Identification and mitigation of load-limit restrictions for bridges and culverts to be crossed with permitted oversize and overweight loads (local and state as applicable).

***Road Transportation***

*Project Site Access*

- Temporary or permanent access to public roads from Project construction areas will be designed in accordance with the standards of the entity which manages the roadway. New permanent access to public roads will only be required at the O&M Facility. The Applicant will construct new permanent access to Vail Loop Road SE in accordance with Thurston County access design requirements. The Applicant will develop and implement a CTMP to coordinate construction in order to minimize traffic disruptions on Vail Loop Road SE in Thurston County resulting from construction of the O&M Facility.
- The Applicant will also coordinate construction activities with the owners and operators of commercial forestry lands to minimize impacts to their activities during construction of the WTGs and associated facilities in the lease area of the Project and within the private lands where the gen-tie line will be located.
- The Applicant will improve existing and construct new private access roads in accordance with applicable local and state requirements for commercial forestry roads. Drainages and culverts associated with these new and improved road segments will be designed in accordance with DNR Road Maintenance and Abandonment Plans and county requirements for stormwater control, as well as road construction standards outlined in the Applicant's lease terms with Weyerhaeuser (see Section 3.3.6.1).
- The Applicant will reclaim temporary road shoulders upon completion of construction and return the shoulders to their original use. The Applicant will restore the locations of temporary roads constructed to access collector system and gen-tie line locations to their original condition upon completion of construction.
- The Applicant will enter into haul route agreements with Lewis County and Thurston County to document existing road conditions, road damage that has occurred as a result of Project construction-related traffic, and measures to repair such damage.
- The Applicant will obtain a Lewis County Work in the Right-of-Way permit for any work in Lewis County right-of-way (Lewis County 2018). Commercial Approach Permits will be obtained for improvement or development of access points to Lewis County public roads (Lewis County 2018). Finally, the Applicant will ensure that no monuments within the Public Land Survey System or within Lewis County road right-of-way will be disturbed during the construction process (Lewis County 2018).
- The following mitigation measures are identified to avoid, reduce, or compensate for the potential impacts to the transportation system as a result of the heavy haul route from the Port of Tacoma:
    - Schedule construction hauling outside of the weekday AM and PM peak commute periods.

- Prepare a CTMP (to be submitted to applicable local agencies prior to construction for review) to direct and obligate the contractor to implement procedures to minimize traffic impacts in consultation with WSDOT, Thurston County, and the City of Tacoma.
- Comply with state, county, and city permitting requirements for oversize and overweight vehicles.
- Notify adjacent land owners in the Project vicinity prior to construction of transportation routes that will be used for construction equipment and labor.
- Place approved state, county, and/or city advanced warning construction signs prior to and during construction.
- Use certified flaggers when necessary to direct traffic when oversize and overweight trucks either enter or exit public roads, to minimize risk of accidents.
- Avoid restricting traffic flow for more than 20 minutes during the construction phase.
- When slow or oversized wide loads are being hauled, appropriate vehicle and roadside signing and warning devices will be deployed per the CTMP. Pilot cars will be used as the WSDOT dictates, depending on load size and weight.
- Conduct pre- and post-haul construction visual assessments of roadway surface conditions to identify weak or deteriorated areas along the haul route that may require repair as a result of Project-related traffic. Following the end of construction, repair all pavement sections affected by Project-related traffic as needed to pre-construction conditions or better.
- The Applicant will videotape the haul route roadways to document pavement conditions before and after construction and address changes in discussions with WSDOT, Thurston County, and the City of Tacoma.

*Traffic Generation*

- As shown in the analysis, traffic impacts for the proposed Project will primarily be related to activity during construction. To manage the impacts, the CTMP will describe procedures for construction activity including such items as flagging, notifications, site-specific traffic control, truck routes, hours of operation, and delivery times. The Applicant will coordinate with local jurisdictions during preparation of the CTMP in order to minimize local traffic disruptions to the maximum extent possible. Construction activities will be scheduled so that the most intensive activities in terms of construction traffic arriving and departing the site are spread out over time to avoid the peak periods of traffic congestion.
- As discussed in additional detail in Section 3.12.6, prior to beginning of construction, the Applicant will identify emergency access routes to Project construction sites in coordination with local emergency providers. These routes will include combinations of public and private access roads. The roads selected will be documented in the Construction Emergency Response Plan and the CTMP.

*Regional Haul Routes*

- Physical obstructions (signs, barriers, light poles, etc.) present adjacent to the road can be temporarily moved or removed and then replaced in their original location when the

transportation of WTG components is completed. Vegetation can be trimmed; if larger trees need to be removed, the Applicant will work with landowners to provide compensation for trees removed. Finally, at locations where travel in the wrong lane is needed to accommodate the load, the Applicant will obtain the necessary permits for such transits and will implement temporary traffic controls to ensure safer conditions for other road users. The haul route was physically surveyed to evaluate required route improvements by Vestas. Preliminary results of the survey indicate that with the addition of the route improvements, it is feasible to transport materials for this Project. See Appendix 3.11-2 for more information.

- The Applicant has completed a delivery route analysis to identify roads to be used for transportation of oversize and overweight components. The Applicant will work with the affected jurisdictions to develop and implement plans to conduct temporary or permanent roadway improvements and/or temporary relocation of roadside equipment. If needed, the Applicant will obtain permits for temporary modifications to roads and their adjacent areas. If modifications are on private lands, the landowner will have the opportunity to decide if the improvements will be permanent or if the Applicant will return disturbed areas to their original condition.
- As part of the development of the CTMP, the Applicant will work with the various jurisdictions where roadway impacts are anticipated to determine applicable requirements on a case-by-case basis. Applicable communities and agencies include: Lewis County, Thurston County, Pierce County, the Port of Tacoma, WSDOT, and the cities of Tacoma, Parkland, Spanaway, Roy, and McKenna. Discussions are underway with these agencies; however, the Applicant does not currently have agreements in place. The Applicant will obtain applicable local and state permits for transportation of oversize and overweight loads.
- The current design for the haul route requires 3 bridge crossings, 13 underpass locations, one aerial underpass, and 12 overpass locations. The Applicant will identify in the engineering design stage the structural condition and load-limit restrictions for bridges and culverts to be crossed with permitted oversize and overweight loads with each jurisdiction. The Applicant will work with local jurisdictions to identify deficiencies and implement solutions to mitigate for adverse impacts to such structures; if mitigation is not possible, the Applicant will select transportation routes avoiding such structures. Approximately 4 months in advance of WTG component delivery, the transportation contractor will engage with local, state, and federal agencies to assess any load and clearance restrictions and secure necessary permits.
- Port delivery of the WTG components has been evaluated from the Port of Vancouver, Port of Longview, Port of Olympia, and the Port of Tacoma. Due to handling and transportation constraints that would require significant transportation and infrastructure obstructions, such as nighttime transportation of the turbine blades under police escort against traffic flow along I-5, it has been established that the only feasible port of delivery is the Port of Tacoma. It is currently anticipated that turbine blade delivery will occur at night under police escort; the Applicant will enter into agreements with local law enforcement services and incur associated costs with this escort service. Discussions with the agencies and communities mentioned above, along with property owners is somewhat premature considering that transportation of the components will not begin until early summer 2019; however, outreach is underway.
- As part of the CTMP, the Applicant will also coordinate with appropriate jurisdictions to minimize impacts to public road users from temporary delays, detours, or road closures resulting from the transportation of oversize or overweight components. The Applicant will

coordinate with Weyerhaeuser and emergency responders to identify any temporary road closures that could prevent access to the site via specific routes, however the main Project access roads will be maintained in a cleared condition at all times.

*Public Transportation*

- As part of the CTMP, the Applicant will determine whether any large equipment deliveries will use Twin Transit bus routes and will coordinate with Twin Transit to minimize service disruptions.

*Air Transportation*

- No unavoidable adverse impacts will occur to air transportation systems during Project construction; therefore no mitigation measures are needed. Permanent intrusions into navigable airspace are discussed under Section 3.11.6.2, Operation.

*Rail and Waterway Transportation*

- No unavoidable adverse impacts will occur to rail and waterway transportation modes during Project construction, therefore no mitigation measures are needed.

***Operation***

*Road Transportation*

Project Site Access

- Following construction, permanent private access routes will be stabilized. No additional mitigation will be required beyond typical road maintenance activities during Project operations.
- As discussed in additional detail in Section 3.12.6, prior to beginning of operations, the Applicant will identify emergency access routes to permanent Project facilities in coordination with local emergency providers. These routes will include combinations of public and private access roads. The roads selected will be documented in the Operations Emergency Response Plan. The Applicant will coordinate with Weyerhaeuser and emergency responders to identify any temporary road closures that could prevent access to the site via specific routes; however, the main Project access roads will be maintained in a cleared condition at all times.

Traffic Generation

- Transportation-related impacts during the operating period for a wind project are typically minimal, because operating projects generate minimal traffic. Once construction is complete, the operating work force for the Project is estimated at eight full-time personnel dedicated to the operations and maintenance of this Project.
- Project operation will generate small volumes of additional traffic associated with workers commuting to the Project and occasional service delivery trips. As shown in the Table 3.11-4, the Project is anticipated to generate 40 weekday daily trips with 10 trips during both the weekday AM and PM peak hours, with service delivery trips ranging from zero to usually no more than four daily trips. Although the Project would operate 24 hours per day, seven days a week using

an automated system, the operations crew will typically work eight-hour days Monday through Friday. This relatively small amount of daily trips will have no effect on local traffic operations.

- Similarly, physical demands on the local transportation system will essentially end once construction is completed. Oversized truck and trailer loads will be required during Project operation only in the event of a mechanical failure, such as if the blades on a WTG needed to be replaced. Occurrences such as this are expected to be rare and isolated.

Regional Haul Routes

- Should oversize or overweight loads need to be transported to the Project for maintenance, repair, or replacement activities, it is expected that regional haul routes similar to those identified in Section 3.11.4.1 above will be used. The Applicant will coordinate with WSDOT and applicable local jurisdictions to confirm the appropriate routes to be used and how route obstructions will be temporarily managed and mitigated. The Applicant will acquire the necessary permits for transportation of oversize or overweight loads. If needed, the Applicant will obtain permits for temporary modifications to roads and their adjacent areas. If modifications are on private lands, the landowner will have the opportunity to decide if the improvements will be permanent or if the Applicant will return disturbed areas to their original condition.

- The Applicant will identify with each jurisdiction the structural condition and load-limit restrictions for bridges and culverts to be crossed with permitted oversize and overweight loads. The Applicant will work with local jurisdictions to identify deficiencies and implement solutions to mitigate for adverse impacts to such structures; if mitigation is not possible, the Applicant will select transportation routes avoiding such structures. As needed, the Applicant will implement mitigation for traffic control impacts resulting from the transportation of these loads.

Public Transportation

- No adverse impacts are anticipated to public transportation services as a result of Project operation; therefore, mitigation measures are not needed.

Air Transportation

- The Applicant has mitigated impacts to navigational airspace by removing WTGs which presented adverse impacts to DoD operations (see Section 2.11). The Applicant will also implement the final WTG and meteorological tower marking scheme as approved by the FAA.

Rail and Waterway Transportation

- No adverse impacts are anticipated as a result of Project operation; therefore, mitigation measures are not warranted.

***Decommissioning***

- The impacts resulting from Project decommissioning activities will be similar to those during construction. Mitigation measures implemented during construction will similarly be implemented during decommissioning.

**Public Services and Utilities**

***Construction and Decommissioning***

The Applicant will implement mitigation measures to prevent the occurrence of conditions which may result in impacts to worker and public health and safety. The following mitigation measures will also be implemented during construction to reduce the potential impact to public services and utilities. Mitigation measures for specific public services and utilities follow.

- Construction crews will have health and safety plans in place that will identify the location of fire extinguishers, local hospitals, and other relevant information that will minimize the health and safety risk.
- The Applicant will provide all local police, fire, and emergency medical agencies with emergency response information for the Project, including employee contact information, procedures for rescue operations to the nacelles, and location of rescue basket prior to construction and decommissioning of the Project. The Applicant will review and update employee contact information annually and provide any changes to the appropriate agencies.
- The Applicant's Emergency Response Plan (Appendix 3.6-1) will address actions in the event of major natural disasters affecting the Project.

*Fire Protection*

- The Applicant will enter into a Fire Services Agreement with the appropriate fire districts from Lewis and Thurston counties. Outreach with the applicable fire service providers is underway for Fire Service Agreements. The Fire Services Agreements will include an emergency response and fire prevention plan that addresses notification and coordination protocols and requirements for the Project. In addition, the Riverside Fire Authority has provided a signed adequate facility statement that the fire district has the capacity to serve the project (Appendix 3.12-1). A fire at one of the facilities will be responded to in accordance with the Fire Service Agreement. A fire in the forested portion of the Project Area will likely fall under the jurisdiction of DNR with support from the local fire protection districts, as needed. In addition, the Applicant will coordinate with Weyerhaeuser on the fire response plan.
- The Applicant and Lewis County are continuing discussions with local fire agencies to ensure that response plans are in place prior to construction. Prior to construction, the Applicant shall submit to the County such fire response plans, completed with local fire agencies, with confirmation of concurrence with such plans.
- The Applicant has developed and will implement a draft Emergency Response Plan (Appendix 3.6-1). The ERP will be finalized prior to the start of construction. The Plan will address the following elements and will be communicated with local emergency response providers prior to construction:
    - **Incident notifications:** emergency contacts, essential information to include in notifications, and other appropriate response coordination and notification techniques.
    - **Spill response:** immediate procedures to follow in the event of spills on land or water, and location and contents of spill kit. An SPCC plan will be prepared that describes how to address oil spills, including reporting requirements.

- **Site evacuation:** orders, communication, and muster points.
- **Fire prevention and response equipment:** training standards, restricted activities, proper storage of materials, exclusion zones and fire breaks, location and use of fire protection equipment.
- **Material safety data sheets:** location, purpose, and use.
- **Site specific hazards:** wildlife threats, professional services and equipment available, anti-venom.
- **Local emergency services:** review of contact information for all local emergency response services including hospital, police department, and fire department. Directions to nearest emergency hospital and protocols for employer notification of emergency situations.
- **Rescue at height:** rescue at height training requirements and certifications, safety equipment and inspection requirements, and emergency response drills. Rescue at height plan to be prepared by contractor and implemented during WTG erection.
- **Radio communications for severe weather:** weather monitoring services and advisories, high impact weather, lightning alert protocols. Helicopter landing zones.

- In addition to fire prevention and response measures described in Section 3.6.6.1, the following mitigation measures will be implemented during construction to reduce the potential impacts to fire protection services:
  - As part of the Emergency Response Plan (Appendix 3.6-1), the Applicant will develop and implement a Fire Prevention and Protection Plan. A draft version of the Fire Prevention and Protection Plan is included as Appendix 3.12-2 and will be finalized prior to the start of construction in consultation with local providers. The plan will be developed in accordance with the Southeast Thurston Regional Fire Authority in Thurston County and Lewis County Fire Protection Districts #1, #2, and #12; as well as in accordance with the property lease. All construction work will follow the guidelines and commitments of the plan. At a minimum, the plan will include an inventory of fire suppression resources; stipulations for stopping construction during elevated IFPL levels or as dictated by DNR; stipulations for providing crews with radio or cellular telephone access to immediately report a fire; provide training for construction crew members on extinguishing small fires; include guidance on preventing and responding to wildland fires; and stipulations for the availability of water to fight fires.
  - The Applicant will ensure that access for firefighting crews and equipment to all construction sites is maintained. This will include ensuring that personnel and construction equipment do not create obstructions to firefighting equipment or crews.
  - In order to easily communicate immediate fire incidence during construction of the Project, all construction crews and site construction management personnel will be equipped with operational communication equipment and open communication pathways will be established.
  - Blasting supplies will be used and stored in accordance with applicable local, state, and federal requirements, for example WAC 296-52.
- In addition, fire breaks will be a design feature. Each road will be considered a site fire break, and each WTG location will have an area of up to 6.75 acres cleared, free of timber and brush overgrowth, to aid in protection against fire dangers.

*Law Enforcement*

The following mitigation measure will be implemented during construction and decommissioning to reduce the potential impacts to law enforcement services:

- Development and implementation of a construction-security procedure during Project construction to reduce the potential need for increased police services to the Project Area.

*Medical Services*

The following mitigation measure will be implemented during construction to reduce the potential impacts to medical services:

- Require job-specific health and safety training, including cardio-pulmonary resuscitation, first aid, and OSHA training related to construction.
- Provide all construction personnel with site- and job-specific safety and first aid training. During construction, prior to initiating work, hold daily "tail-gate" safety briefings.

*Schools*

No mitigation measures are required for schools.

*Utilities*

The following mitigation measures will be implemented during construction to reduce the potential impacts to utilities:

- The well supplying the O&M Facility will be installed by a well contractor licensed pursuant to Chapter 173-162 WAC, and in compliance with the requirements and standards of Chapter 173-160 WAC. The well will be installed consistent with Thurston County requirements for new wells.
- Coordinate and comply with the Thurston County Environmental Health Division, and comply with all county and state septic tank and subsurface disposal field design, installation, and maintenance requirements.
- Collect sanitary wastes in portable toilets during construction. Disposal of sanitary wastes will be managed through a contract with a portable toilet waste vendor.
- Dispose of hazardous materials in accordance with all applicable state and federal laws and regulations.
- Dispose of construction debris to the county landfill for disposal or recycling.
- Prior to ground disturbance, locate below ground utility lines as necessary and work with utility providers to temporarily suspend or relocate utility service.
- Work with utility providers for temporary relocation of overhead utilities potentially impacted by hauling of oversize components.

***Operation***

The Applicant will implement mitigation measures to prevent the occurrence of conditions which may result in impacts to worker and public health and safety. The following mitigation measures will also be implemented during operations to reduce the potential impact to public services and utilities.

*Fire Protection*

- The Applicant will enter into a Fire Services Agreement with the appropriate fire districts in Lewis and Thurston counties. The Fire Services Agreements will include an emergency response and fire prevention plan that addresses notification and coordination protocols and requirements for the Project. A fire at one of the facilities will be responded to in accordance with the Fire Service Agreement. A fire in the forested portion of the Project Area will likely fall under the jurisdiction of DNR with support from the local fire protection districts, as needed. In addition, the Applicant will coordinate with Weyerhaeuser on the fire response plan.
- The Applicant will develop and implement an Emergency Response Plan. The Plan will address many of the same elements addressed in the construction phase ERP, but will be updated post-construction to reflect any additional operational considerations. A draft of the ERP is attached as Appendix 3.6-1 and will be finalized prior to the start of construction with consultation with local service providers. In addition to the elements presented above for the construction ERP, the Operational ERP will also address the following elements:
    - **Safety requirements:** Project will comply with Weyerhaeuser's travel standards including speed limits, use of CB radios and escorts, signage, flaggers, and road designations. Personal protection equipment is required for all visitors and personnel.
    - **Security/Gates:** Security Plan will be developed prior to Project operation. Local emergency service providers will be provided keys to any secured entrances and gates.
    - **Fire/Emergency Procedures:** operations will comply with appropriate industrial fire precaution levels.

The following mitigation measures will be implemented during operations to reduce the potential impacts to fire protection services:

- The Applicant will provide any special training to fire district personnel and DNR for fires related to WTGs.
- During a fire, the electrical system and gen-tie line will be immediately de-energized. The Applicant will provide all appropriate response agencies with a contact person who has the authority to authorize the shutdown.
- In order to easily communicate immediate fire incidence during construction, operation, or maintenance of the Project, all crews and inspectors will be equipped with operational communication equipment and open communication pathways will be established.

*Law Enforcement*

The following mitigation measures will be implemented during operations to reduce the potential impacts to law enforcement services:

- Security gates and fencing will be installed surrounding the O&M Facility and Project substation.

- Entry doors to the WTGs will be locked.

*Medical Services*

The following mitigation measures will be implemented during operations to reduce the potential impacts to medical services:

- Require job-specific health and safety training, including cardio-pulmonary resuscitation, first aid, OSHA training related to the work environment at a wind farm, and a guidance manual on equipment inspection.

*Schools*

No mitigation measures are required for schools during operations.

*Utilities*

No mitigation measures are required for utilities during operations.

**Socioeconomics**

Impacts of the Project will be primarily positive, resulting from increases in income for local businesses and increased employment opportunities primarily during Project construction (though minor positive impacts may also occur during operation), and increased tax collections during construction and operation. Potential adverse impacts on socioeconomic resources may occur if peak construction overlaps with the peak recreation season, resulting in a shortage of temporary lodging in the local study area. The primary adverse impact will be on customary users of hotels/motels and campgrounds in the area, who may have to pay more for lodging, or travel further than they otherwise would have. Mitigation options include directing workers who require temporary lodging during these peak times to stay further away from the Project site where temporary lodging supply is not limited, or providing private accommodations in close proximity to the Project Area (e.g., RV parking areas that are not open to the public).