

1 **3.14 CUMULATIVE IMPACTS**

2 This section identifies past, present, and reasonably foreseeable actions planned in the vicinity of the
3 Project Area. It includes an analysis of potential cumulative impacts that could result from the Project
4 when combined with these actions for each element of the natural and built environments.

5 **3.14.1 Study Methodology**

6 Past projects are those that have historically shaped the area. Present projects are those that were
7 recently completed, are currently underway, or are ongoing. Reasonably foreseeable projects those that
8 are likely to occur based on available information. Publicly available information such as local and state
9 agency websites and local and state government capital improvement programs were reviewed to identify
10 the projects addressed in this section. Lewis and Thurston counties were also contacted and asked to
11 provide information.

12 The duration for analysis completed for this section is based on the anticipated Project development
13 schedule. Most impacts identified below relate to the construction phase of the Project. Certain impacts
14 would occur during operation of the Project and continue until the Project end of life; others would only
15 occur temporarily based on the duration of contemporaneous activities.

16 Generally, the geographical area for consideration of cumulative impacts focuses on the area surrounding
17 the Project Area, including south central Thurston County and north central Lewis County eastwards from
18 the I-5 transportation corridor. However, because certain impacts can be of a broader regional nature,
19 such regions are identified on a case-by-case basis to analyze such cumulative impacts.

20 Decommissioning impacts were considered in this analysis where possible. However, because the
21 anticipated lifespan of the project is approximately 30 years, these impacts are speculative for detailed
22 consideration in this analysis. It is anticipated that decommissioning impacts would be similar to
23 construction impacts because they require the removal and disposal of the components of the Project
24 and restoration of the Project footprint or return to a condition where previous commercial forestry
25 activities can resume.

26 **3.14.2 Regulatory Framework**

27 The range of impacts to be addressed in an EIS includes direct, indirect, and cumulative impacts (WAC
28 197-11-792). SEPA requires that agencies address cumulative impacts. According to Ecology’s SEPA
29 Handbook, an EIS should look at how the impacts of a proposal would contribute to the total impact of
30 development in the region over time (Ecology 1998). Generally, cumulative impacts are the impacts
31 created by the Project combined with those of other past, present, and reasonably foreseeable actions.
32 The impacts of multiple actions could be minor individually, but they sometimes result in substantial
33 impacts collectively over a period of time.

34 **3.14.2.1 Past Actions**

35 In general, urbanized uses in the Centralia and Chehalis areas and along the I-5 corridor have been
36 developed since the late 19th century. Development in this area is historically oriented around the timber-
37 related industries, such as harvesting and milling. Industrial timber harvest remains active on
38 Weyerhaeuser lands, although harvest levels are not as intense as they were in the 1960s to 1980s. Other
39 major industrial facilities in the region were established in the Centralia and Chehalis areas. Power

1 generation was established based on the presence of locally extracted coal, and the Skookumchuck Dam
2 was developed to provide water to both industrial and urban users.

3 The Project Area itself is characterized predominantly by commercial forestry. There are no residential
4 uses within the Project Area where the Facility will be constructed. The closest residence is approximately
5 4 miles away from a WTG. On the western edge of the Project Area, a portion of the gen-tie line and
6 interconnection of the Project at the Tono substation will be located in vicinity of areas which have been,
7 or currently are, used for industrial purposes, including historical mining of coal, power generation,
8 activities associated with the forestry industry, and other manufacturing. Rural residential uses are also
9 present, with a higher density in the vicinity of local communities close to the I-5 corridor. The cities of
10 Centralia and Chehalis are the nearest urban areas with developed urban and commercial uses, in addition
11 to the major industrial uses identified above.

12 **3.14.2.2 Present Projects**

13 Ongoing development in the vicinity of the Project Area reflects the existing land uses present and
14 activities supporting such uses (for example road improvements or improvements of regional recreational
15 opportunities). Recent data indicates more development county-wide in Thurston County than in Lewis
16 County, with 2,081 building permits issued in Thurston County and 232 in Lewis County in 2016 (U.S.
17 Census Bureau 2016).

18 Within the Project Area, the primary ongoing activity is commercial forestry. Commercial forestry
19 activities also currently occur outside of and adjacent to the Project Area. Where zoning permits, rural
20 residential uses continue to be developed. In the near vicinity, power generation activities are conducted
21 at the Centralia Coal Plant (TransAlta 2017a). Mining associated with this plant has ceased since 2006 and
22 reclamation of areas disturbed by mining is ongoing (TransAlta 2017b). The Chehalis Generation Facility,
23 a natural gas-fired combined-cycle electric generation facility, is operated by PacifiCorp south of Chehalis
24 (EFSEC 2017).

25 Various transportation projects have been recently completed in the region (Lewis County 2016, Thurston
26 County 2017a, WSDOT 2017a). With construction started in 2017, WSDOT will complete the replacement
27 of the existing I-5 Chamber Way overpass with a taller, wider structure in 2018 (WSDOT 2017b). The new
28 overpass replaced the existing structure and temporary bridge that is currently in place.

29 On a broader geographical scale, there is one wind project in operation, the 6-MW Coastal Energy Project
30 located in Grays Harbor County and Pacific County (CCAP 2017, Strategic Development Solutions 2011). It
31 consists of four 1.5 MW WTGs constructed in 2010 within a 29-acre project area straddling Grays Harbor
32 and Pacific counties. The project is situated approximately one mile from the coast of the Pacific Ocean
33 and sits at the top of hills overlooking the region's cranberry farms that line the area coastline. The site
34 was previously a third-generation clear cut land with minimal development consisting of logging access
35 roads (Strategic Development Solutions 2011).

36 **3.14.2.3 Reasonably Foreseeable Actions**

37 In general, given the Lewis and Thurston County Comprehensive Plans and current zoning designations,
38 development within the study area is likely to include the continuation of past and present activities
39 associated with industrial and forestry uses, additional rural residential development outside of urbanized
40 centers, and residential and commercial development within and around urbanized centers. Various types
41 of smaller local residential, commercial, and industrial land use proposals may occur within the cumulative

1 impact study area and occur concurrently with Project development; however, the impacts of such
2 activities will be limited to their immediate vicinity. Lewis County and Thurston County staff reviewed and
3 confirmed the reasonably foreseeable actions identified below (Witherspoon 2018, Smith 2018)

4 Reasonably foreseeable industrial development within the study area is expected to occur with respect
5 to ongoing power generation at the Centralia Coal Plant and ongoing mine site reclamation activities. The
6 source of fuel for power generation at the plant is expected to change when TransAlta implements its
7 requirements to retire existing coal-fired burners in 2020 and 2025 as a result of the 2011 TransAlta Energy
8 Transmission Bill (Washington State Legislature 2011, TransAlta 2017c).

9 According to the DNR County Quarterly Timber Income Reports, the forestry industry will likely continue
10 to comprise a portion of economic activity within the cumulative impacts study area (DNR 2017). Privately
11 owned forest lands, including those where the Project will be located, will continue to be actively
12 managed.

13 Publicly available information was reviewed to identify specific reasonably foreseeable actions proposed
14 in the vicinity of the Project Area or within the broader region surrounding the Project Area. The following
15 projects were identified.

16 *Land Use and Recreation Projects*

17 Funded by Lewis County, the North Lewis County Industrial Access (NLCIA) Project is exploring strategies
18 that increase access to industrial properties and improve system-wide mobility of people and goods and
19 remove barriers or incentivize compatible industrial development. The project goal is to create 1,000 new
20 family-wage manufacturing jobs in Lewis County by 2030 with at least half of those occurring by 2020.
21 The study is looking at alternative routes utilizing existing interchanges, existing local roadway
22 improvements, and the feasibility of a new interchange between Harrison Avenue (Exit 82) and Grand
23 Mound (Exit 88), as well as potential new routes or connections. Local network improvements in the
24 greater study area are being looked at for increased connectivity, better industrial access, safer travel
25 conditions on freight corridors, and smoother traffic flow. Strategic planning for the project is currently
26 ongoing (Lewis County 2017). Construction and operation dates for specific projects are not known at this
27 time.

28 Yelm – Tenino Trail Improvements, located in southern Thurston County, running from Highway 510 in
29 the City of Yelm to Tenino City Park are proposed. Within the regional study area, the 14-mile Yelm-Tenino
30 Trail (Trail Link 2017) travels through the rural towns of Yelm, Rainier, and Tenino on a paved route
31 through agricultural areas, forests, and wetlands. Phase I development of the trail included 7 miles of
32 paved trail surfaces linking Yelm and Rainier, signage, parking areas, and basic trailhead facilities in the
33 City of Yelm. Phase II development included similar development to Phase I plus trestle reconstruction
34 and an additional 7 miles of developed trail connecting Rainier and Tenino. Phase III constructs restroom
35 facilities, parking areas, other support facilities, and a park site at McIntosh Lake.

36 Thurston and Lewis counties and WSDOT plan for future transportation system improvements on a regular
37 basis (Lewis County 2016, Thurston County 2017, WSDOT 2017a). Although transportation system
38 improvements are proposed throughout the broader region during the Project construction period, none
39 are proposed within the immediate vicinity of the Project Area. Additional improvements are identified
40 beyond 2019 in the planning documents cited; however, cumulative impacts are unlikely given the small
41 number of Project operation-related vehicle trips starting in 2019.

1 *Other Regional Initiatives*

2 Since 2010 multiple local, state, and federal stakeholders have been involved in the Chehalis Basin Study.
3 (CBS). In 2016 and 2017 Ecology led the preparation of a Programmatic Environmental Impact Statement
4 (PEIS) evaluating alternatives designed to reduce flood damage and restore aquatic species habitat in the
5 Chehalis Basin in southwestern Washington (Ecology 2017). The strategy is a program of integrated, long-
6 term, flood damage reduction and aquatic species habitat restoration actions. The PEIS evaluates action
7 alternatives including one or a combination of large-scale flood damage reduction actions (i.e., flood
8 retention facility, airport levee improvements, I-5 projects, Aberdeen/Hoquiam north shore levee, and
9 restorative flood protection). Although the Project is located in the eastern-most portion of the CBS study
10 area, the Project location is not central to the focus of the study on activities that relate to flooding of
11 main stem of the Chehalis River, and tributaries to the main stem of the Chehalis River. Certain fish
12 passage improvement activities associated with alternatives considered could take place at lower
13 elevations surrounding the Project Area but will be limited in footprint and scope in comparison to other
14 CBS activities proposed for flood control within the main Chehalis river floodway. Further, although the
15 PEIS has considered these alternatives, actual projects have not been selected, nor is a timeline identified
16 for implementation of potential courses of action identified in the PEIS.

17 *Future Energy Development*

18 The Coyote Crest Wind Park was proposed to be constructed on commercial forestry lands located in
19 Lewis, Pacific, and Grays Harbor counties. The project, as permitted but not yet constructed, proposes to
20 develop 47 WTGs generating approximately 120 MW (Scheibmeir 2010, Lewis County 2010). Most of the
21 Project facilities would be located on privately or publicly owned commercial forest lands. Although a firm
22 construction date for the project is unavailable, the proponent has not formally cancelled the project.

23 The Radar Ridge Wind Project was proposed near Naselle, Pacific County in 2008. The project would have
24 consisted of 32 WTGs generating approximately 82 MW. The project was proposed on a site already being
25 used for industrial activity including logging, gravel quarry operations, and commercial communications
26 facilities. Although preliminary biological resource studies and conservation plans were prepared and
27 submitted to regulatory agencies, the project was cancelled by its proponents, and environmental review
28 was not completed (Energy Northwest 2011). This project, although identified, is therefore not included
29 in the cumulative impacts assessment below.

30 In October 2017 a Master Application for a pre-submission conference for the Tono Solar project was
31 submitted to Thurston County (TransAlta 2017d). The proposal would be an up 180 MW photovoltaic solar
32 project to be built at the previous TransAlta Centralia mine site in Thurston County. At its largest size, the
33 project would be situated on 1,000 acres of reclaimed mine land. The project has been bid into PSE's
34 request for proposals for Renewable Energy. The project would require up to 300 construction personnel
35 and four to five full time operations personnel. Finished, the project would represent a foot print of
36 9,131,000 to 39,700,000 square feet. The project would include access roads, an operations and
37 maintenance building, and would interconnect at the Tono substation. Currently, construction of the
38 project is planned for 2019-2020, with an operational goal of 2020. A preliminary assessment by Thurston
39 County regarding the potential presence of critical areas and the permits that might be required from the
40 county was completed (Thurston County 2017b). An Application for Forest Land Conversion (affecting 320
41 acres of commercial forest lands) was submitted to Thurston County in January, 2018 (Macy 2018). There
42 is no information publicly available regarding the potential environmental impacts of the project or when
43 permit applications would be submitted. Because of the limited availability of information regarding Tono

1 Solar project impacts as described in the project documentation publicly available, cumulative impacts
2 resulting from implementation of this project can therefore only be assessed at a qualitative level.

3 As indicated above, the Centralia Coal Plant retirement of existing coal-fired burners in 2020 and 2025
4 would result in a loss of baseload power generation. However, there is no publicly available information
5 as to if or how such baseload capacity would be replaced. Impacts resulting from replacement of baseload
6 capacity are therefore speculative, and are not considered in this cumulative impacts analysis.

7 **3.14.3 Cumulative Impacts of the Project**

8 The following subsections summarize the cumulative effects that the Project, in combination with the
9 past, present, and reasonably foreseeable future actions identified above, would have on the various
10 environmental resources discussed in this EIS.

11 **3.14.3.1 Earth Resources**

12 *Geology and Soils*

13 Past and present commercial logging of the Project site and its surrounding area, industrial activities
14 related to mining and power generation, agriculture, construction of rural residences, and development
15 of the existing transportation network have resulted in cumulative impacts to topography changes and
16 soils through increased erosion from wind or rain exposure and compaction.

17 As the reasonably foreseeable future actions are developed, these actions likely would also contribute to
18 the same type of geological and soil impacts. Additional topographical modifications may occur as each
19 reasonably foreseeable future action is implemented. The Project will result in topographical changes
20 limited to the construction of access roads, WTG erection within the Project Area, Project substation,
21 meteorological towers, and gen-tie line installation in areas of steep slopes. Such changes will be
22 cumulative to those resulting from past and future installation of logging roads. Cumulative impacts to
23 topography are not anticipated for the installation of the interconnection at the Tono substation and the
24 O&M Facility because these locations are flat. Soil erosion is addressed below. Soil compaction would
25 occur in areas permanently developed for Project facilities, i.e., yards associated with the structures,
26 segments of new or improved access roads, and aprons surrounding the WTGs. This compaction would
27 be cumulative with other areas previously developed but will be limited to Project locations.

28 Additional topographical modification is not expected during Project operations as disturbed areas will
29 have been vegetated or stabilized. Therefore, operation of the Project will not result in a cumulative
30 topographical impact. Project-related soil erosion could occur if stabilized surfaces are improperly
31 installed or insufficiently maintained; this impact could be cumulative if logging activities are also
32 conducted so as to result in uncontrolled erosion.

33 On a broader regional scale, although the impacts resulting from the Project and other existing or
34 reasonably foreseeable wind and solar energy proposals would cumulatively increase permanent ground
35 disturbance, the impacts of each proposal would be limited to its footprint and immediate vicinity. All
36 three projects considered together would not cause any cumulative impacts to earth resources. Impacts
37 would also be spread over time given that only one other proposal has been constructed in the past.

1 *Erosion Hazard*

2 Soil erosion and compaction are typically limited to the footprint of development; however, broader scale
3 soil erosion can also occur as a result of long-term land use changes (e.g., historical conversion of natural
4 lands to farming). Project construction could result in cumulative erosion impacts resulting from
5 disturbance of existing vegetation. However, the Applicant, just like any other proponent of new
6 development, is required to comply with local, state, and federal requirements to minimize erosion
7 resulting from stormwater exposure. All reasonably foreseeable actions would be constructed in
8 compliance with the applicable requirements of the 2012 Stormwater Management Manual for Western
9 Washington (as amended in December 2014) and any additional local regulatory requirements, thereby
10 minimizing this cumulative impact. The 2012 Stormwater Management Manual for Western Washington
11 (as amended in December 2014) includes several recommended practices during development of a
12 SWPPP to consider the cumulative potential for erosion and stormwater runoff that could result from
13 several individual/unrelated sources located in proximity to one another. During operation, use of existing
14 logging roads by both Project and active logging activities can result in increased erosion rates of road
15 surfaces. Project roads will be designed and maintained to minimize such erosion.

16 *Landslide Hazard*

17 Certain Project WTGs and access roads will be constructed in locations identified as having high
18 susceptibility to landslides. Such locations could be in close proximity to existing and actively used logging
19 roads. Improper installation of Project facilities, when combined with the nearby and concurrent use of
20 logging road sand associated soil disturbances, could result in exacerbating landslide potential at these
21 locations. As addressed in Section 3.1.6.1, Project facilities will be constructed in accordance with the
22 requirements of applicable CAOs. Hazard assessments and geotechnical borings will be conducted at
23 locations susceptible to landslide and final topography designed to minimize the potential for future
24 landslides in these locations.

25 *Mine Hazard*

26 The Project does not involve mining nor will it be located at locations where mining previously occurred.
27 There will not be any cumulative mine hazard impact.

28 *Seismic Hazards*

29 Neither the Project, nor other reasonably foreseeable actions, would increase the risk or probability of a
30 seismic event. Should a seismic event occur within the Project vicinity, it would impact the Project, as well
31 as any reasonably future proposals located within the seismic event impact area to varying degrees,
32 depending on the susceptibility and preparedness of each project to withstand and respond to structural
33 damage, and the proximity of each Project to populated areas, hazardous material sites, and emergency
34 response resources. The cumulative effect that the Project would have on the seismic event's impact to
35 the general region as whole would be low since the Project would not involve a high level of seismic risk
36 in terms of structural damage, hazardous materials, or human health and safety concerns; therefore, the
37 Project would not noticeably effect the region's ability to respond to emergencies in a seismic event, and
38 would not noticeably contribute to an increase in regional seismic susceptibility or seismic risk factors.

1 *Volcanic Hazards*

2 Neither the Project, nor other reasonably foreseeable actions, would increase the risk or probability of a
3 volcanic event. Should a volcanic event occur within the Project vicinity, it would impact the Project as
4 well as any reasonably future proposals located within the volcanic event impact area to varying degrees,
5 depending on the susceptibility and preparedness of each project to withstand and respond to structural
6 damage, and the proximity of each Project to populated areas, hazardous material sites, and emergency
7 response resources. The cumulative effect that the Project would have on the volcanic event's impact to
8 the general region as a whole would be low since the Project would not involve a high level of risk in terms
9 of structural damage, hazardous materials, or human health and safety concerns; therefore, the Project
10 would not noticeably effect the region's ability to respond to emergencies in a volcanic event.

11 *Channel Migration Zones*

12 The Project will not involve construction of structures within channel migration zones; therefore, there
13 will not be any cumulative impact.

14 **3.14.3.2 Air Quality**

15 Depending on their nature, past and present development and activities have cumulatively contributed
16 to emissions to the regional air shed. However, as more modern air emission sources have been included,
17 older ones have been retired. The cumulative impact to air quality at the present time is assessed by local,
18 state, and federal air pollution control agencies as described in Section 3.2.2.1.

19 Construction of the Project will result in emissions from construction vehicles and equipment and from
20 fugitive dust resulting from ground-disturbance activities. These emissions would have a cumulative
21 impact on the air shed only if other reasonably foreseeable proposals are constructed in close vicinity to
22 the Project construction and at the same time. Most of the Project construction activity is associated with
23 installation of access roads and WTGs in the Project Area, with shorter duration and more limited activities
24 associated with installation of the O&M facility, interconnection at the Tono substation, and construction
25 of the gen-tie line. The location of construction is geographically removed from the locations of existing
26 or future reasonably foreseeable proposals which involve construction activity. Therefore, Project
27 construction will not result in a cumulative impact.

28 Operation of the Project will result in emissions from infrequent onsite vehicular travel in association with
29 Project site maintenance and the infrequent operation of an emergency generator located at the O&M
30 Facility. Potential emissions generated by worker vehicles arriving and departing from the site will be small
31 and localized. The emergency generator will be tested on a regular basis for short durations of time and
32 will otherwise only be operated in the event of a power failure, thus also resulting in short-duration, small
33 and localized emissions. Generation of electricity by the WTGs does not emit air emissions. Because of
34 the minimal nature of Project air emissions, and the rural nature of the Project location, the Project will
35 not result in significant cumulative air quality impacts within the air shed where the Project is located.

36 On a broader regional scale, although the impacts resulting from the Project and other existing or
37 reasonably foreseeable actions could increase temporary construction related air emissions, the impacts
38 of each proposal would be limited to its immediate vicinity and to the time when construction occurs.
39 Therefore, there would be no cumulative impacts to air quality resulting from construction. The Project's
40 air emissions resulting from operation are minimal and localized and would not contribute to a cumulative
41 impact in relationship to other transportation, electrical generation, and industrial air emission impacts.

1 **3.14.3.3 Water Resources**

2 *Surface Water, Water Quality, and Stormwater Runoff*

3 Past and present development and activities have cumulatively caused various adverse impacts to
4 waterbodies and streams in the general vicinity of the Project. Portions of some of these waterbodies
5 have been channelized or filled. Others have been affected by pollutants from stormwater runoff,
6 wastewater discharges, and other sources. Reasonably foreseeable future actions, including continued
7 commercial forestry practices, could also contribute to these cumulative impacts; however, the location
8 of such impacts would occur in the portions of the watershed where such proposals are located.

9 The Project could result in cumulative impacts to surface water, water quality, and stormwater runoff in
10 association primarily with ongoing forestry activities within the Project Area. Roadway construction and
11 maintenance in the Project Area and vicinity could increase stormwater runoff, and increase
12 sedimentation and turbidity if construction equipment crosses drainage ways or if erosion control BMPs
13 are insufficient or fail. The Project could incrementally contribute to adverse cumulative impacts to
14 waterbodies and streams in the general Project vicinity. However, mitigation measures implemented to
15 minimize such impacts would reduce the cumulative impact overall.

16 The Project and other cumulative projects also would have a longer-term adverse cumulative impact to
17 these water bodies through the addition of increased impervious areas, which could increase the amount
18 of stormwater runoff to these water bodies, however the increase in impervious surfaces for the Project
19 are expected to be minimal and largely limited to the WTG foundations and the O&M Facility.
20 Implementation of stormwater detention and other stormwater management practices for the Project
21 will serve to minimize and possibly avoid project contributions to these cumulative impacts, including
22 contributions to cumulative impacts to other water bodies in the area.

23 Finally, Project-related water quality impacts will be small in the context of region-wide forestry activities
24 and are not expected to significantly contribute to region-wide hydrological impacts. Past and present
25 uses have resulted in cumulative habitat conversion. Reasonably foreseeable future actions, such as
26 ongoing land development and timber harvests, would continue this trend. For example, at the Vail Tree
27 Farm, Weyerhaeuser harvests approximately 50,000,000 board feet of timber per year over a cumulative
28 harvest area of 2,000 acres (Lowe 2018). The Project-related contribution to water quality impacts
29 resulting from construction and decommissioning is very minor on this regional scale.

30 *Groundwater*

31 Cumulative impacts to groundwater quality can result from multiple sources of pollutants released to the
32 ground surface, which infiltrate into groundwater. The Project could contribute to the cumulative effect
33 of potential groundwater contamination. Spills of materials could occur during both construction and
34 operation of the Project. However the potential for spills or contamination would be no larger than
35 existing commercial forestry or agricultural operations.

36 *Public and Private Domestic Water Supplies*

37 Impacts to groundwater from past and present development and activities in the general Project vicinity
38 have included groundwater withdrawals for wells. Some of the reasonably foreseeable future actions
39 could also consume groundwater. However, groundwater will not be withdrawn at the Project site for
40 construction purposes. Construction water will be sourced outside the immediate vicinity of the location

1 of Project construction from local municipal water utility sources under existing water rights. Such
2 sourcing could increase water consumption at the source; however, withdrawals would be made in
3 accordance with applicable water right withdrawal provisions.

4 Only water withdrawals in areas close to the O&M Facility could potentially result in a cumulative impact
5 resulting from Project operations; however, none of the reasonably foreseeable proposals that could
6 consume groundwater are located near the Project site. Therefore, the cumulative impacts are not
7 anticipated.

8 *Floodplains*

9 The Project does not involve construction within regulated floodplains. Therefore, there will not be any
10 cumulative impacts to floodplain resources.

11 On a broader regional scale, although the impacts resulting from the Project and other existing or
12 reasonably foreseeable wind energy proposals would cause impacts to water resources described above,
13 the impacts would occur in separate watersheds, and cumulative impacts would be unlikely.

14 **3.14.3.4 Biological Resources**

15 *Vegetation and Habitat*

16 Past and present land development, timber harvest, and agricultural uses have resulted in a change in the
17 composition of vegetation and habitat types in the Project vicinity. In general, land development and
18 agricultural uses have resulted in conversion of forested areas to non-forested areas, and timber harvests
19 have resulted in a mosaic of forest ages, with average stand age declining over time from relatively short
20 stand rotations. Changes in stand structure and complexity, patch size, and species distribution also have
21 occurred. Few large, old-growth conifers or late-successional stands exist in the general Project vicinity.

22 Accordingly, past and present uses have resulted in cumulative habitat conversion and an ongoing pattern
23 of habitat fragmentation. Reasonably foreseeable future actions, such as ongoing land development and
24 timber harvests, would continue this trend. For example, at the Vail Tree Farm, Weyerhaeuser harvests
25 approximately 50,000,000 board feet of timber per year over a cumulative harvest area of 2,000 acres
26 (Lowe 2018). As indicated above, the Tono Solar proposal would result in a harvest over 320 acres.

27 Project construction will take place in the context of the existing use of the Project vicinity generally for
28 commercial forestry, which includes regular cycles of clear cutting and reforestation. Nonetheless, by
29 removing trees and other vegetation, development of the Project and other reasonably foreseeable
30 actions would contribute incrementally, though in a relatively minor and temporally limited way, to
31 cumulative impacts.

32 On a broader regional scale, although the impacts resulting from the Project and other existing or
33 reasonably foreseeable wind energy proposals would cause impacts to similar types of habitats as all three
34 are mainly proposed on commercial forestry lands, these lands are managed specifically for timber
35 harvesting, where harvesting is an ongoing activity. The Project will only result in a temporary removal of
36 forest vegetation through the Project lifetime; following Project decommissioning, the land will be
37 returned to commercial forestry. Therefore, in the long term, the Project will not contribute to cumulative
38 loss of this habitat.

1 Special-Status Plant Species

2 Plant species listed as threatened or endangered and other special-status plant species have been
3 cumulatively affected by past and present development and activities through habitat loss and direct
4 effects to individual species. This trend will likely continue as future development occurs in areas where
5 these species are present. However, the Project will not contribute to this adverse cumulative impact
6 because, as described in Section 3.4.4.1, the Project will not affect any threatened or endangered or other
7 special status plant species.

8 Because the Project does not contribute any adverse impacts to special status plant species, there would
9 also not be any cumulative impacts on a broader regional scale resulting from cumulative wind energy
10 development.

11 Wetlands

12 Incremental losses and degradation of wetlands over time have cumulatively reduced wetland resources
13 in the United States. In the Project vicinity, wetlands likely were previously impacted by construction of a
14 variety of activities, including development of roads and railroads, agricultural activities, and past timber
15 harvests. Reasonably foreseeable future actions may also affect wetlands in the Project vicinity or a
16 region-wide basis, but it is expected that these future projects would be required to avoid, minimize, and
17 compensate for any potential impacts to wetlands from filling or other activities as required by local, state,
18 and federal permitting requirements. While the construction and operation of the Proposed Action may
19 minimally impact wetlands, implementation of the Project would not contribute to cumulative impacts to
20 wetlands as impacts will be permitted and mitigated as part of compliance with the state and federal
21 Clean Water Act and local critical area ordinances.

22 *Habitat and Wildlife*

23 Terrestrial Wildlife Species

24 Past and present development and other activities have had an impact on terrestrial wildlife species and
25 their habitat in the general Project vicinity. The clearing and conversion of land since approximately the
26 19th century has resulted in the loss of wildlife habitat. Wildlife habitat also has been modified through
27 activities such as logging and other silvicultural activities, which have further altered and fragmented
28 habitat. Wildlife species also have been directly affected by hunting and trapping activities, as well as
29 incidental harm and killing from other human activities in the area.

30 Reasonably foreseeable future actions involving highway improvements, residential, commercial,
31 agricultural, and other development and logging would be expected to incrementally add to these
32 cumulative impacts.

33 Some terrestrial wildlife species may be disturbed by Project construction activities or avoid the Project
34 Area temporarily during construction, however the construction activities associated with the Project are
35 consistent with the existing timber activities onsite to support silvicultural operations. The Project thus
36 would contribute incrementally, though in a relatively minor way, to the cumulative impact on terrestrial
37 wildlife species and their habitat. Reasonably foreseeable future actions involving highway improvements,
38 residential, commercial, agricultural, and other development and logging are expected to incrementally
39 add to cumulative impacts to the degree that they are conducted in habitats used by terrestrial wildlife
40 species.

1 On a broader regional scale, although the impacts resulting from the Proposed Action and other existing
2 or reasonably foreseeable wind energy proposals could cause impacts to similar types of terrestrial
3 species given that similar habitats would be affected on commercial forestry lands, the Proposed Action
4 and other wind energy projects would not affect the same populations of such species. Cumulative
5 impacts would be unlikely.

6 Bird and Bat Species

7 Past and present development and other activities have had an adverse impact on wildlife species,
8 including birds and bats, due to permanent alteration and loss of their habitat in the general Project
9 vicinity. The clearing and conversion of land for home sites, utility infrastructure, and other uses since
10 approximately the 19th century has resulted in a loss of habitat for birds and bats. Habitat for birds and
11 bats has also been modified through activities such as logging and other silvicultural activities, which have
12 altered and fragmented habitat. This habitat loss and modification has resulted in the displacement and
13 mortality of these wildlife species. Further, as discussed below, past and present residential and other
14 development has a continuing impact on these species, through building, window, transmission line and
15 telecommunication facility strikes, vehicular strikes, and the predation of these species by domestic cats.
16 Reasonably foreseeable future actions are expected to have a continuing negative impact on these
17 species.

18 As documented in Section 3.4, the Project would impact bird and bat species. Because of the variability in
19 species, habitat, and flight patterns on a regional basis, it is difficult to assess potential cumulative impacts
20 of development of wind power on birds and bats over a large geographic area.

21 In terms of cumulative impacts resulting from wind energy development in the region where the Proposed
22 Action is located, as indicated above, although three other proposals have been brought forward, only
23 two received permits, and of these two only one was constructed. Information regarding the impacts of
24 the Coastal Energy project on bird and bat species indicates that “the actual risk to avian species was likely
25 overstated due to the conservative nature of pre-project surveys lack of knowledge of how species may
26 interact with wind turbine generators” and that overall the project presented “relatively low risk
27 thresholds due to the size of the Project” (Pacific County 2008). As required by permits issued to the
28 project, CCAP is working in partnership with WDFW to complete an impact study and develop standards
29 for coastal wind farm impacts on avian and bat species. Injuries and deaths are usually anticipated to
30 occur based on birds and bats flying into the WTG blades when WTGs are operational. However, to date,
31 there is guidance that developers must use when proposing to undertake wind farm projects in coastal
32 Washington. As such, this effort is critical to better understanding the negative impacts that may be
33 produced with respect to bats and birds.

34 The proponents of the Coyote Crest Wind Park conducted a baseline analysis of bird and bat use of the
35 Coyote Crest WTG proposed locations (Lewis County 2010). Numerous species, typical of the habitats
36 present, were identified. The potential presence of protected avian species (spotted owl and marbled
37 murrelets) was also assessed. The Coyote Crest Wind Park provides suitable habitat for spotted owl, but
38 no spotted owls were detected during surveys. The Coyote Crest site does not support known nesting
39 locations for marbled murrelet but is located in the vicinity of lands identified medium-priority sites for
40 marbled murrelet conservation emphasis, and known nesting locations occur within 2 miles of the site.

41 As described in Section 3.4, operation of the Project could result in unavoidable mortality to birds and
42 bats through WTG collisions; however, the level of individuals affected is not expected to negatively affect

1 the population viability of any single species. Continued operation of the Coastal Energy wind project also
2 could presumably cause some mortality to birds and bats, mitigated through implementation of habitat
3 acquisition and other measures require by permit (Pacific County 2008). Raptors, including bald eagles,
4 golden eagles, northern goshawks, and others could travel between the two wind projects, and the two
5 projects would be considered part of the same regional population of raptors. The project thus could
6 contribute incrementally, though in a relatively minor way, to the cumulative impact on bird and bat
7 species in the region.

8 Fatality rates are typically reported on a per turbine basis or per nameplate capacity (MW). Information
9 provided herein has been reported by MW to account for differences in turbine capacity, which range
10 from 100 kw to 3.0 MW or more. The regional mortality estimates for birds in the Pacific Northwest is 2.7
11 birds per MW per year (minimum 0.9 to maximum 2.0 birds per MW per year; NWCC 2004). Mortality
12 estimates for raptors in the Pacific Northwest is 0.10 raptors per MW per year (minimum 0.00 to maximum
13 0.47 raptors per MW per year; Erickson et al. 2000, URS Corporation 2010, Johnson et al. 2003, Gritski
14 and Kronner 2010, Young et al. 2006, Downes and Gritski 2012). Although the Pacific Northwest mortality
15 estimates are largely based on wind facilities east of the Cascades, the pre-construction mean use was
16 comparable between these sites and the Project, meaning that there is no indication that mortality rates
17 at the project and within the area of regional significance would be substantially different. Therefore, in
18 the absence of wind facilities in similar habitats, it is assumed that the level of bird and raptor mortality
19 in these studies can be expected at the Project. The Project would therefore not significantly increase
20 regional rates of bird mortality resulting from wind energy generation.

21 Regional estimates for bat mortality are not readily available and data has not been provided within the
22 Pacific Northwest. Nationally, adjusted bat fatality rates may be higher than bird fatality rates, especially
23 at facilities in the upper west and eastern forests: two facilities within the Appalachian region reported
24 fatality levels of greater than 30 bats per MW per year, but there are also reports as low as one to two
25 bats per MW per year at other facilities in the eastern U.S. (Hein et al. 2013). On average, reported bat
26 fatality rates are substantially lower at facilities in the western U.S. (Arnett and Baerwald 2013; Hein et al.
27 2013). Based bat activity at the project site and in comparison to the mortality rates reported above, there
28 is no indication that the cumulative mortality rates at the project in combination with regional mortality
29 rates would be significantly increased.

30 Finally, the evaluation of cumulative impacts for wind energy generation facilities should be considered
31 in the context of other mortality threats to these species, which have been estimated in recent research
32 as many times larger than those from wind energy generation (Erickson et al. 2005, 2008, USFWS 2018).
33 Moreover, the cumulative impacts analysis for wind energy generation facilities does not account for
34 potential mortality to birds and bats caused by climate change and the beneficial biological impact of
35 renewable energy in avoiding these impacts. For example, one study from 2009 estimated that, based on
36 performance in the United States and Europe, wind farms and nuclear power stations are responsible
37 each for between 0.3 and 0.4 bird fatalities per gigawatt-hour of electricity while fossil-fueled power
38 stations are responsible for about 5.2 fatalities per gigawatt-hour (Sovacool 2009).

39 *Fish Species*

40 Past development and other activities have had an impact on fish species, including the alteration and
41 loss of their habitat in the general Project vicinity. Impacts to fish and other aquatic resources from past
42 development in the region include the alteration of streams and rivers by the introduction of dams, loss
43 of riparian habitat, increased sediment loading, increased stream temperatures, pollution from herbicide

1 and insecticide use, changes in peak and low stream flows, fragmentation of fish habitat, decreases in
2 streambank stability, altered nutrient supply, and stormwater runoff from roads and bridges.

3 The Project will not result in direct impacts to surface water where fish habitat may be present, and will
4 implement mitigation measures to protect water quality from construction and operations related
5 stormwater runoff. Other foreseeable actions would also be subject to similar mitigation measures.
6 Therefore, cumulative impacts are not anticipated.

7 The proposed road work within the Project vicinity may cause temporary increases in impacts from
8 construction activities. These impacts are anticipated to continue into the foreseeable future.

9 Typically, wind energy generation projects in the region tend to be located in upland areas and generally
10 well away from fish habitat, which is also true of the Project. Therefore, wind energy projects in the region
11 in general, and the Proposed Action in particular, would not contribute to direct cumulative impacts to
12 fish species.

13 **3.14.3.5 Energy and Natural Resources**

14 Electricity required onsite for the Project during construction would be minor and generated by diesel-
15 powered portable generators or acquired from PSE's electrical utility system. Reasonably foreseeable
16 actions would likely be constructed in a similar fashion. When complete, the Project will produce up to
17 137 MW of electricity annually, increasing the amount of electricity produced via renewable resources
18 available in Washington.

19 Natural resources will also be consumed in small quantities for Project construction and operations such
20 as water for domestic use at the O&M Facility and light maintenance use, as well as lubrication fluids and
21 oils for WTG operation. However, the amount of these resources needed is small compared with the
22 available supply. Foreseeable proposals would likely consume similar amounts of energy and natural
23 resources. However, since these projects are being proposed to improve natural resource conditions and
24 improve transportation conditions in the long term cumulate impacts are expected to improve conditions.

25 **3.14.3.6 Health and Safety**

26 During construction of the Project, there could be a slight increase in risk of traffic or worker accidents
27 during the construction period. This impact would take place in the background of existing land use
28 patterns based on commercial forestry, industrial, and residential development. Given the anticipated low
29 number of incidents and the available capacity of the local emergency responders and hospitals to
30 respond to those incidents, the cumulative impact would be relatively minor and would be reduced once
31 construction is completed. The addition of Project operations to active commercial forestry lands will not
32 conflict with ongoing forestry operations. For more information see the Section 3.6 and specifically Table
33 3.6-1, Weyerhaeuser Lease Emergency Procedure Provisions.

34 On a broader regional scale, although other existing or reasonably foreseeable wind energy proposals
35 would result in similar impacts to those discussed for the Proposed Action, these impacts would occur in
36 different locations and would not result to cumulative impacts for any specific residences or emergency
37 service providers. Response to regional fire incidents can result in emergency providers from one fire
38 district temporarily providing assistance to another district through mutual aid agreements. However,
39 adverse impacts to service providers would only occur if response was needed for a region-wide event; in
40 such cases, broader intervention by state and out of region local resources would be coordinated.

1 **3.14.3.7 Noise**

2 In order for a cumulative noise impact to occur, noise emissions from the Project and from other
3 reasonably foreseeable actions must occur within the same relative vicinity and at the same time. The
4 reasonably foreseeable proposals are located at significant distance from the Project, and their noise
5 levels will attenuate to background levels before they reach the vicinity of Project activities. Cumulative
6 impacts are therefore not expected.

7 The Project will result in temporary construction noise, including noise from Project construction-related
8 traffic on local roads. Although cumulative increases in ambient levels could occur in combination with
9 other vehicle traffic on local roads, such increases would be temporary in duration.

10 Noise emissions resulting from Project operations will attenuate to background prior to reaching any
11 sensitive receptors; there would therefore not be any discernable cumulative impact.

12 Other existing or reasonably foreseeable wind energy proposals would result in similar impacts to those
13 discussed for the Project, these impacts would occur in different locations and would not result to
14 cumulative impacts for any specific noise receptors.

15 **3.14.3.8 Land, Shoreline Use, and Recreation**

16 Past, present, and reasonably foreseeable actions have resulted in changes to land use and would be
17 expected to continue based on the past patterns of incremental growth of developed land uses in the
18 Project vicinity. The Project will be consistent with existing land use planning and zoning designations for
19 Project facilities and will not result in any inconsistencies with existing or planned adjacent land uses. The
20 Project also will have little or no effect on existing land use patterns. It will not conflict with ongoing
21 commercial forestry activities occurring adjacent to Project facilities.

22 The Project will have little to no impact on recreation resources. Given the abundant recreational
23 resources in the area and the low level of impacts, the Project's contribution to cumulative impacts to
24 recreation would be minor.

25 Reasonably foreseeable actions would also be required to comply with land use ordinances and zoning
26 and they would need to consider impacts to recreation areas prior to development. Therefore, no
27 unplanned cumulative impacts are anticipated.

28 **3.14.3.9 Visual Resources**

29 While parts of the Gifford Pinchot National Forest near the Project Area remain undeveloped, past and
30 present development activities have changed the visual landscape in the immediate Project vicinity by
31 introducing manmade features and altering natural forms. These uses include residential, commercial,
32 and agricultural development, the construction of highways, bridges and roads, electrical transmission
33 towers and hydroelectric dams, and telecommunication facilities. Ongoing human activities in the vicinity
34 also contribute to continuing changes in visual resources, primarily from views of clear-cutting and
35 agricultural openings in natural vegetation patterns. Reasonably foreseeable future actions would be
36 expected to continue this trend, as the past and present patterns of land use are expected to continue.

37 During Project construction, the Project will result in visible construction activities. However, if other
38 reasonably foreseeable actions are constructed at the same time, these activities would happen at other

1 locations, and a cumulative impact to viewers is unlikely. Of the reasonably foreseeable projects, only
2 Tono Solar would be constructed in vicinity of the Project gen-tie-line. Travelers along local roads adjacent
3 to both Tono Solar and the Project gen-tie line could catch temporary glimpses of both projects being
4 constructed. Such views would be of short duration and of a temporary nature. After construction is
5 complete, the presence of the proposed WTGs will change the visual resources in the area and may result
6 in changes in views for some nearby residents, recreationists, and motorists passing by on county roads
7 or forest roads and possibly intermittent views along I-5.

8 A similar impact could occur for residents of and frequent visitors to the Project Area. While residents of
9 Rainier or Tenino, for example, might not see WTGs from the Project on a daily basis, they would likely
10 experience repetitive views of WTGs (or portions of WTGs) through their local travels over a period of
11 weeks, months, or years. The “significance” of these perceptions would be individual in nature and
12 inherently subjective and when considered in the context of an altered landscape that includes
13 hydroelectric generation facilities, transmission towers and lines, roads, bridges, highways,
14 telecommunications infrastructure, and other land uses is not considered to be significant. Consequently,
15 some local residents and frequent visitors might perceive what they individually consider to be a
16 substantial change to the overall character of the local landscape although the geographical and
17 topographical setting of the Project (including north-south trending ridge lines) limits its regional visibility.

18 Other reasonably foreseeable actions would result in similar visual impacts to those discussed for the
19 Project, these impacts would occur in different locations. Therefore cumulative impacts for any specific
20 viewers are not anticipated.

21 **3.14.3.10 Historical and Cultural Resources**

22 Cultural and historic resources in the Project vicinity have been and are being affected because of past,
23 present, and current development and activities. These impacts include the use of the Project Area for
24 commercial silvicultural activities. Although the Project would not affect any known upland archaeological
25 or historic resources, there is the potential for the Project to impact previously undiscovered cultural
26 resources or artifacts. Mitigation measures proposed to address these impacts are identified in Section
27 3.10, Historic and Cultural Resources.

28 Although other reasonably foreseeable actions could result in impacts to historic and cultural resources,
29 prior to development investigation to identify possible impacts will need to be completed. Therefore,
30 cumulative impacts to archeological or historical resources could be avoided.

31 **3.14.3.11 Transportation**

32 Based on the information included in Section 3.11, localized and regional traffic will continue to fluctuate
33 based on economic conditions and regional development. The Project will contribute primarily to traffic
34 during the construction phase of the Project. Therefore, there could be some traffic congestion for
35 travelers along major haul routes when large components are being delivered and local roads during
36 periods when Project construction coincides with planned road maintenance activities. However, the
37 Project will implement construction traffic management protocols to identify possible conflicts with local
38 and regional transportation systems and will provide measures to minimize Project contributions to such
39 conflicts. These measures will minimize cumulative impacts to the shortest duration and smallest
40 inconvenience possible.

1 At this time the construction periods for other reasonably foreseeable actions is unknown. However, it is
2 likely that construction could result in traffic impacts of a similar nature to those discussed for the Project.
3 Because these impacts would occur in different locations and at different times they are not anticipated
4 to result in cumulative impacts for any specific traffic resource. Given the proximity of the Tono Solar
5 proposal to the Project, cumulative impacts to traffic patterns and damage to local roads could occur.
6 However, there is insufficient information available to determine whether in fact both projects would be
7 constructed within a similar time frame and which roads could be used as construction deliveries and
8 access for both projects concurrently.

9 **3.14.3.12 Public Services and Utilities**

10 *Fire Protection and Law Enforcement*

11 Construction of the Project, and the use of construction workers from outside the immediate area, could
12 result in a minor and temporary increase in the demand for public services including police departments
13 and local fire departments. If other reasonably foreseeable actions are constructed at the same time,
14 there may be a cumulative increase in demand for emergency response services and law enforcement
15 agencies. However, this demand will be short term as it will occur during the construction period.

16 The temporary increased demand for services during the construction period caused by up to 250 staff
17 per week would be substantially reduced during operation for the permanent workforce of nine full-time
18 workers.

19 *Medical Services and Schools*

20 Should medical services be needed during construction of the Project and other reasonably foreseeable
21 proposals, the same medical service providers could be used. The temporary increased demand for
22 medical services of up to 250 Project construction staff, in addition to construction workers serving other
23 projects contemporaneously, could cause an increase in medical visits. However, there are multiple
24 medical practices in the Chehalis/Centralia area, and additional services are available in the Olympia area
25 to satisfy demand. Therefore, cumulative impacts as a result of the Project and those of reasonably
26 foreseeable actions is not anticipated.

27 Up to six full-time staff will be employed at the Project site during operation. It is anticipated that these
28 employees would live with their families in incorporated and unincorporated areas of the area
29 surrounding the Project. Given the reasonably foreseeable actions identified, it is not anticipated that they
30 would result in additional persons moving to live in the area. The result and timing of other proposals
31 regarding attracting additional people to live in the area is speculative (for example activities resulting
32 from the NCLIA and CBS). The Project is unlikely to cause a measurable cumulative increase in medical
33 service provider visits or additional students in the study area, beyond those resulting from normal
34 population growth. Therefore, cumulative impacts as a result of the Project and of reasonably foreseeable
35 actions is not anticipated.

36 *Utilities*

37 Impacts to public and private water supplies are addressed in Section 3.13.3.3 above.

38 Past and present development and activities have resulted in an incremental increase in demand for
39 public services and utilities. With the exception of the NCLIA, reasonably foreseeable actions primarily

1 incur impacts during the construction phase. Construction of the Project along with other reasonably
2 foreseeable proposals would result in incremental use of utility services for collection of sanitary and solid
3 waste at the construction sites. However, the regional infrastructure to collect and dispose of such wastes
4 has the capacity to absorb incremental increases during each proposal's construction period. The Project
5 would not be expected to adversely affect the overall capacity or ability to serve of any utility in the area,
6 and thus would not contribute to cumulative impacts to utilities.

7 The Project would result in a small incremental use of utility power during operation of the O&M Facility.
8 As indicated above, only the NCLIA has the potential to increase utility power usage through induced
9 population and economic growth; however, at this time the amount of such growth cannot be predicted.
10 Therefore, it is unlikely that the Project will result in a negative cumulative impact on utility power supply
11 in the region. The construction periods for reasonably foreseeable actions identified is unknown.
12 However, given the types of projects proposed, cumulative impacts are unlikely.

13 The Project is not expected to result in adverse impacts to public services and utilities. On a broader
14 regional scale, although other existing or reasonably foreseeable actions could result in similar impacts in
15 the localities where they are located, a cumulative impact on any specific locality or service provider is
16 not expected. Cumulative impacts to public services from the Project and Coyote Crest Wind Park could
17 occur if both projects were constructed at the same time; however, no construction date has been
18 announced for Coyote Crest Wind Park. Cumulative impacts would be negligible because construction of
19 the projects is likely to occur at different times.

20 Operation of the Project will result in a net positive cumulative addition of renewable energy resources
21 to Washington State, and as such may contribute to a positive impact on utilities and their customers who
22 wish to purchase electricity generated from renewable resources.

23 **3.14.3.13 Socioeconomics**

24 Cumulative socioeconomic impacts may occur when more than one future foreseeable project has an
25 overlapping construction schedule that creates a demand for workers that cannot be met by local labor,
26 resulting in an influx of non-local workers and their dependents and resulting in excessive demand on
27 public services.

28 The Tono Solar project is the only future foreseeable project whose construction schedule could overlap
29 with the Project and thus could compete with Skookumchuck Wind for skilled labor. However, since the
30 construction schedule for both Tono Solar and Skookumchuck Wind are relatively short, and the two
31 projects are estimated to collectively employ less than 1 percent of the regional workforce, half of which
32 would likely already reside within commuting distance, no adverse impact to local schools, housing, and
33 public services are anticipated. Additionally, about half of the employment workforce for the Project is
34 assumed to be specialized/skilled laborers who would temporarily relocate from outside of the regional
35 study area; a lack of these skilled workers is not anticipated to occur since employment needs for both
36 projects combined would represent a very small fraction of the total available skilled workforce
37 nationwide.

38 Socioeconomics impacts to the area will largely be beneficial but will not dramatically alter the area as a
39 result of the Project and will not contribute to any cumulative socioeconomic impacts since all other
40 planned and future projects would result in similar minor beneficial impacts that would not dramatically

1 affect the overall socioeconomic environment. Therefore, no cumulative impacts to socioeconomics are
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