CYPRESS CREEK RENEWABLES

June 16, 2023

Joanne Snarski
Energy Facility Siting Specialist
Washington Energy Facility Site Evaluation Council
PO Box 43172
Olympia, WA 98504 -3172

Re: Responses to Data Request 1 for the Carriger Solar, LLC Project Application for Site Certification

Dear Ms. Snarski,

Cypress Creek Renewables, LLC, (CCR) is submitting the enclosed responses to Data Request 1 for the Carriger Solar, LLC Project (Project)'s Application for Site Certification (ASC) submitted on February 10, 2023, to the Washington Energy Facility Site Evaluation Council (EFSEC). This data request response package includes the Data Request 1 table with associated responses and includes several attachments including the following:

- Attachment Noise-1: Revised Acoustic Assessment Report
- Attachment Rec-1: DR-REC-1 Response (figure and table)
- Attachment Veg-1: Draft Vegetation Management Plan for the Carriger Solar, LLC Project
- Attachment Veg-2: Potential for Rare Non-vascular Plants and Lichens to Occur within Survey Area
- Attachment Wlf-1: Wildlife corridors figure
- Attachment Wlf-2: Western gray squirrel buffers

The response to DR-T-01 Transportation is in process and will be provided in July 2023. The response will include an additional traffic analysis report following the scope outlined by EFSEC, Klickitat County, and Washington Department of Transportation in the May 24, 2023 call with CCR. This information will be submitted as Attachment T-1.

Additionally, we have requested more clarification on the data request DR-WLF-01 (see data response table).

If you have any questions or require further information, please contact me at lauren.altick@ccrenew.com.

Sincerely,

Lauren Altick
Project Developer

Encls

cc: Sean Greene, EFSEC
Tai Wallace, CCR
John Hanks, CCR
Julie Alpert, CCR
Leslie McClain, Tetra Tech

<table>
<tr><th>Item</th><th>Section</th><th>Report</th><th>Information Request</th><th>Applicant Response</th></tr>
<tr><td>DR-HC-01</td><td>Historic and Cultural Resources</td><td>ASC</td><td>Provide an explanation of why different Tribes are listed throughout the ASC. The Tribes differ between sections 1.F, 2.A.5, 2.B.6, 3.19.a, 4.18, 4.19.A, 4.19.B, and 4.19.C.</td><td>Sections 1.F, 2.A.5, 2.B.6, 4.18, 4.19.A, 4.19.B, and 4.19.C of the ASC, with the exception of Section 3.19.a, consistently lists the following Tribes: Confederated Tribes of the Umatilla Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Yakama Nation, the Wanapum, and the Nez Perce Tribe. The Confederated Tribes of the Grand Ronde were listed in the List of Stakeholders in Section 1.F but were not listed in sections 2.A.5, 2.B.6, 3.19.a, 4.18, 4.19.A, 4.19.B, and 4.19.C. This was an unintended oversight by the Applicant, and the intention was to include the Confederated Tribes of the Grand Ronde in these sections along with the other listed Tribes.

Additional clarification to Sections 2.B.6 and 3.19.a of the ASC is hereby provided:

In Section 2.B.6, the ASC states: The Project Study Area is within the ceded territory of the Yakama Nation. The Project submitted a letter to the Confederated Tribes of the Umatilla Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Yakama Nation, the Wanapum and the Nez Perce and requested an opportunity to meet with their staff to discuss the proposed development plans and the coordination on cultural and archaeological field studies. This sentence should also list the Confederated Tribes of the Grand Ronde as an introductory letter was sent to Mr. Chris Bailey, Cultural Protection Coordinator at the Confederated Tribes of the Grand Ronde on March 25, 2022.

In Section 3.19.a, the ASC states the following: The Survey Area is located within the traditional use area of the Wanapum, Yakama, Chamnapum, Palouse, Umatilla, and Walla Walla, and it is situated within the Ceded Area of the Confederated Tribes and Bands of the Yakama Nation. This is an accurate statement regarding traditional use areas. This reference is different from other sections in the ASC where the reference is to “expert agency participation” or to the list of stakeholder or consultation letters.</td></tr>
<tr><td>DR-HC-02</td><td>Historic and Cultural Resources</td><td>ASC</td><td>Please note that the Wanapum are not a sovereign tribal government, they are enrolled in the federally recognized Confederated Tribes and Bands of the Yakama Nation. Additionally, please note that Rex Buck, Jr., listed as a Tribal contact, passed away in February 2022. The text should be updated and revised.</td><td>The Applicant agrees that the Wanapum Tribe is not a sovereign tribal government and is enrolled in the federally recognized Confederated Tribes and Bands of the Yakama Nation. The Applicant also notes the Tribal contact for the Wanapum Tribe is no longer Rex Buck, Jr. The initial project introduction letter was addressed to Mr. Buck, Jr. and dated 3/25/2022, without the knowledge of his passing.</td></tr>
<tr><td>DR-A-01</td><td>Air Quality</td><td>ASC</td><td>Provide numerical comparison of ambient air quality monitoring results to the applicable ambient air quality standards in the area for the last 3 years. Provide the source of the ambient air quality monitoring data.</td><td>Ambient monitoring data for the years 2020-2022 from the nearest air quality monitors have been summarized and compared to the National Ambient Air Quality Standards (NAAQS) in Table 1. The sources for ambient monitoring data are provided in the footnotes for Table 1. In most cases, the nearest air quality monitors are located far from and in areas classified as more urban than the Project site and should be considered highly conservative estimates of the air quality near the Project. Additionally, as mentioned in Section 4.2.B in the ASC, extended smoke events from regional wildfires have contributed to exceedances of some air quality standards and the EPA has issued waivers for unmet air quality monitoring requirements (Ecology 2022).

Table 1. Ambient Background Concentrations at Air Quality Monitors Nearest Project with Comparison to NAAQS
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Site</th><th>Distance from Project (mi)</th><th>Units</th><th>2020[1]</th><th>2021[2]</th><th>2022[3]</th><th>3-year Design Value</th><th>NAAQS</th><th>% of NAAQS</th></tr>
<tr><td rowspan="2">CO</td><td>1-hour</td><td rowspan="2">Portland - SE Lafayette (OR)
AQS Site ID: 41-051-0080</td><td rowspan="2">88</td><td>ppm</td><td>15.1</td><td>2.1</td><td>1.9</td><td>15.1</td><td>35</td><td>43%</td></tr>
<tr><td>8-hour</td><td>ppm</td><td>1.4[4]</td><td>1.4</td><td>1.7</td><td>1.7</td><td>9</td><td>19%</td></tr>
<tr><td rowspan="2">NO_2</td><td>1-hour</td><td rowspan="2">Portland- SE Lafayette (OR)
AQS Site ID: 41-051-0080</td><td rowspan="2">88</td><td>ppb</td><td>29.4</td><td>31.0</td><td>30.4</td><td>30.3</td><td>100</td><td>30%</td></tr>
<tr><td>Annual</td><td>ppb</td><td>6.4</td><td>6.6</td><td>6.7</td><td>6.7</td><td>53</td><td>13%</td></tr>
<tr><td>PM_{10}</td><td>24-hour</td><td>Yakima 4th Ave (WA)
AQS Site ID: 53-077-0009</td><td>55</td><td>µg/m³</td><td>326</td><td>123</td><td>80</td><td>326</td><td>150</td><td>217%</td></tr>
<tr><td rowspan="2">$PM_{2.5}$</td><td>24-hour</td><td rowspan="2">TOPPENISH - WARD RD (WA)
AQS Site ID: 53-077-0015</td><td rowspan="2">45</td><td>µg/m³</td><td>90</td><td>65</td><td>29</td><td>61.3</td><td>35</td><td>175%</td></tr>
<tr><td>Annual</td><td>µg/m³</td><td>14.1</td><td>11.5</td><td>9.6</td><td>11.7</td><td>12</td><td>98%</td></tr>
<tr><td rowspan="2">SO_2</td><td>1-hour</td><td rowspan="2">Portland - SE Lafayette (OR)
AQS Site ID: 41-051-0080</td><td rowspan="2">88</td><td>ppb</td><td>2.3</td><td>2.6</td><td>3.0</td><td>3.0</td><td>75</td><td>4%</td></tr>
<tr><td>3-hour</td><td>ppb</td><td>2.2</td><td>2.4</td><td>3.1</td><td>3.1</td><td>500</td><td>1%</td></tr>
<tr><td>Ozone</td><td>8-hour</td><td>Hermiston - Municipal Airport (OR)
AQS Site ID: 41-059-1003</td><td>78</td><td>ppm</td><td>0.056</td><td>0.065</td><td>0.064</td><td>0.065</td><td>0.070</td><td>93%</td></tr>
</table>
[1] Data for OR monitors is based on the Oregon Air Quality Monitoring Annual Report: 2020 (Published Dec. 2021); Data for WA monitors is based on the 2022 Ambient Air Monitoring Network Plan (Published June 2022).
[2] Data for OR monitors is from EPA Air Data (https://www.epa.gov/outdoor-air-quality-data); Data for WA monitors is based on the 2022 Ambient Air Monitoring Network Plan (Published June 2022).
[3] All data is from EPA Air Data (https://www.epa.gov/outdoor-air-quality-data)
[4] Wildfire smoke contributed to elevated carbon monoxide in 2020; data presented has wildfire data removed.

Ambient background concentrations are also available through Northwest International Air Quality Environmental Science and Technology Consortium’s (NW-AIRQUEST) Background Concentrations 2014-2017 (IDEQ 2019). The tool was created in collaboration between Ecology, Idaho Department of Environmental Quality, and Oregon Department of Environmental Quality (DEQ) using model and monitoring data from 2014 through 2017 to estimate background concentrations of criteria pollutant design values at user-specified locations in the Pacific Northwest. It was recommended for use by Ecology (via email correspondence) and is also included in Oregon DEQ’s Recommended Procedures for Air Quality Dispersion Modeling (DEQ 2022). In addition to the monitored data presented in Table 1 from EPA Air Data, Table 2 presents the predicted criteria pollutant design value concentrations using NW-AIRQUEST’s tool based on the specified location of the Project.</td></tr>
</table>

				Table 2. NW-AIRQUEST Ambient Background Concentrations with Comparison to NAAQS **Pollutant** | **Averaging Period** | **NW-AIRQUEST Predicted Design Value Concentration** | **NAAQS** | **Units** | **% of NAAQS** **CO** | 1-hour | 1.13 | **35** | ppm | 3% 8-hour | 0.79 | **9** | ppm | 9% **NO_2** | 1-hour | 9.2 | **100** | ppb | 9% Annual | 1.9 | **53** | ppb | 4% **PM_{10}** | 24-hour | 70.3 | **150** | µg/m³ | 47% **$PM_{2.5}$** | 24-hour | 15.4 | **35** | µg/m³ | 44% Annual | 4.6 | **12** | µg/m³ | 38% **SO_2** | 1-hour | 4.8 | **75** | ppb | 6% 3-hour | 6.5 | **500** | ppb | 1% **Ozone** | 8-hour | .058 | **0.07** | ppm | 83% Source: https://idahodeq.maps.arcgis.com/apps/MapSeries/index.html?appid=0c8a006e11fe4ec5939804b873098dfe User-specified coordinates based Project location: 45.83°, -120.89° References: DEQ 2022. Recommended Procedures for Air Quality Dispersion Modeling. Oregon Department of Environmental Quality, March 2022. Available online at: https://www.oregon.gov/deq/aq/cao/Documents/CAORP-AirQualityModeling.pdf Ecology. 2022. 2022 Ambient Air Monitoring Network Plan. June 2022. Publication 22-02-013. Available online at: https://apps.ecology.wa.gov/publications/documents/2202013.pdf IDEQ 2019. Background Concentrations 2014-2017. NW-AIRQUEST. Available online at: https://idahodeq.maps.arcgis.com/apps/MapSeries/index.html?appid=0c8a006e11fe4ec5939804b873098dfe
DR-N-01	**Noise**	ASC	The baseline calculations do not appear to refer to the correct reference. The below FHWA guide does not provide a means to calculate baseline, was it in reference to the FTA Transit Noise and Vibration Impact Assessment Manual (2018)? FHWA (Federal Highway Administration). 2006. FHWA Roadway Construction Noise Model User's Guide, FHWA-HEP-05-054).	Yes, the baseline calculations were made in reference to the FTA Transit Noise and Vibration Impact Assessment Manual (2018). This reference has been corrected in the Revised Acoustic Assessment Report (see **Attachment Noise-1**).
DR-N-02	**Noise**	ASC Attachment H, Acoustic Assessment Report	Revise Table 6 of Attachment H to include the usage factor percentage as mentioned in the sentence preceding the table.	The text in section 3.2 of the Revised Acoustic Assessment Report (see **Attachment Noise-1**) has been revised to indicate that, for the purposes of the construction acoustic modeling analysis the usage factor of all equipment was conservatively assumed to be 100 percent.
DR-N-03	**Noise**	ASC Attachment H, Acoustic Assessment Report	Include distances used to calculate noise impacts in Attachment H, Table 7.	Distances from each NSR to the closest construction work area were added to Table 7 of the Revised Acoustic Assessment Report (see **Attachment Noise-1**).
DR-N-04	**Noise**	ASC	What number or size of BESS was used in the model? Was it modeled as point sources, area sources, or vertical area sources?	There were 60 BESS units included in the Project acoustic modeling analysis. Each BESS Unit was modeled as a combination of area and vertical area sound sources, radiating equally from each face of those sources.
DR-N-05	**Noise**	ASC Attachment H, Acoustic Assessment Report	Noise impacts from the tracking system motors during operations are considered a possible source of noise. Revise Table 8, Attachment H to include this possible source of noise for analysis of noise impacts.	Table 8 of the Revised Acoustic Assessment Report (see **Attachment Noise-1**) has been revised to include the tracking motors planned as part of the Project; however, they were not incorporated in the acoustic model due to their low sound power level. With a sound power level of 50 dBA, at a distance of 10 feet from the resultant sound pressure level would be less than 29 dBA. Even though the Project incorporates a multitude of tracking motors, their cumulative sound contribution is not expected to materially affect offsite received sound levels The reason is due to both the low-level sound emissions of tracking motors and the logarithmic relationship between additive sound sources. Because the decibel scale is a logarithmic scale, two different sound sources combining can't simply be added together arithmetically. For instance, two sound sources with a sound power level of 50 dBA result in a combined sound power level of 53 dBA, as opposed to 100 dBA.

DR-N-06	**Noise**	ASC Attachment H, Acoustic Assessment Report	Noise sources used in the model were stated to have been "provided by equipment manufacturers, based on information contained in reference documents or developed using empirical methods." Provide citations for the references used for the noise sources presented in Attachment H, Table 8.	Citations for the Project sound sources have been added to Table 8 in the Revised Acoustic Assessment Report (see **Attachment Noise-1**), as well as in the references section.
DR-N-07	**Noise**	ASC Attachment H, Acoustic Assessment Report	Provide the maximum modeling results to demonstrate compliance with the WAC (173-60) limits for each receiving land use EDNA classification. Section 4.16a.C.1 of the ASC states, "the Project is predicted to comply with all the applicable WAC regulatory limits at the Project Site Control Boundary." Please provide data or other evidence to support this claim.	As described in section 1.3.2 of the Revised Acoustic Assessment Report (see **Attachment Noise-1**), this analysis conservatively considers Class C lands containing non-participating residences to be evaluated using the Class A WAC limits. Therefore, the Project is located on Class C land while the adjacent properties consist of a mix of lands classified as Class C and Class A. For Class C land containing non-participating residential structures, limits of 60 dBA and 50 dBA apply to daytime and nighttime hours, respectively. For Class C land containing participating Class A residential structures, the daytime limit of 60 dBA and the nighttime limit of 50 dBA may be waived. For Class C land, a daytime and nighttime limit of 70 dBA is applicable. In order to assess compliance, the modeled received sound levels relative to the Project Site Control Boundary must be reviewed. The modeled received sound levels displayed in Figures 2 and 3 related to the Site Control Boundary indicate successful compliance with the 50 dBA nighttime WAC sound limit at all abutting Class A lands and with the 70 dBA WAC sound limit at all abutting Class C lands.
DR-REC-1	**Recreation**	ASC	Provide a figure of known recreational opportunities within the viewshed (labeled "Project Potentially Visible") shown in Figure 4 of the Visual Impact Assessment and an accompanying table identifying approximate distance from the Project and recreational opportunity provided.	See **Attachment Rec-1** which includes the requested figure and table. Please also refer to Part 4, Section 4.17.B of the ASC which describes the mapped recreation areas, including the limitations on public access to the WDFW Private Land Hunting Access Program Parcels and the Goldendale Fish Hatchery.
DR-T-01	**Transportation**	ASC	To ensure transportation circulation, safety, and that LOS will not degrade beyond acceptable levels, it is recommended that the Applicant provide a comprehensive traffic impact analysis (TIA) conducted by a licensed traffic engineer, including LOS analysis at critical intersections along SR-142 in Goldendale for the peak construction phase. The scope and content of the TIA study should be developed in coordination with WSDOT, Klickitat County, and EFSEC.	*Response in Process – will be provided with additional traffic analysis report following scope outlined by EFSEC, County, and WSDOT in 5/24/23 call with CCR. Will be submitted as* ***Attachment T-1***
DR-V-01	**Vegetation**	ASC	When will the Revegetation and Noxious Weed Management Plan available for EFSEC review? Information from the plan will be helpful for the ASC/SEPA review.	See **Attachment Veg-1**
DR-V-02	**Vegetation**	ASC Attachment F, Botanical Survey Report	Were surveys conducted for endangered, threatened, or sensitive bryophytes and lichens protected under the Washington Natural Heritage Program? If not, then please provide the reasons for not including these in the surveys.	Currently there are no species of fungi listed as rare (i.e., endangered, threatened, or sensitive) in Washington (per https://www.dnr.wa.gov/NHPlists and pers. comm. with Jasa Holt of the Washington Natural Heritage Program on Dec. 13, 2022). In addition, based on review of available information no rare non-vascular plants have the potential to occur in the Project Survey Area which includes the Maximum Project Extent in which we are seeking to obtain site certification. This review is provided in **Attachment Veg-2**.
DR-WLF-01	**Wildlife**	ASC	The ASC does not discuss potential indirect effects to wildlife from sensory disturbance or other behavioral changes that may reduce the function of adjacent habitat. Identify the indirect loss of habitat.	The Applicant requests more information and clarification regarding what EFSEC means by the term "…sensory disturbance…" and further how "…sensory disturbance or behavioral changes…" would reduce the function of adjacent habitat.

DR-WLF-02	**Wildlife**	ASC	Identify with supporting literature what the spacing will be between the fenced areas. Identify how wildlife corridors will be designed so as not to create pinch points and increase predation.	Carriger Solar, LLC is seeking to permit the areas within the Maximum Project Extent (MPE). Through careful design and consideration of wildlife values and functions within and surrounding the project site, solar arrays will be fenced outside of all riparian and wetland habitats to allow for the potential passage of wildlife. The fenced solar arrays will be in conformance with all State and County (Critical Areas Ordinance) wetland and riparian setbacks and buffers. The widths of these corridors vary throughout the project site (minimum width of 60-feet) and will, in combination with the visual openness of chain link fencing, facilitate the potential for unimpeded movement of wildlife, including mule deer, between the fenced solar arrays. The length of these corridors does not exceed 0.5 mile where bordered on either side by fenced solar panel arrays. Please see **Attachment WLF-1** for a figure that demonstrates the locations of these potential wildlife corridors between the fenced solar arrays. Efforts will be taken to avoid entrapping wildlife within the facility during installation of the perimeter chain link security fencing and the facility will be checked regularly to allow animals to escape, in the unlikely event that mule deer or other wildlife becomes trapped in the facility. See Part 2, Section A.2.a, subsection 3.5.3 of the ASC for a description of the security fence.
DR-WLF-03	**Wildlife**	ASC	How will the fencing be installed to address small mammal access? Address how the design does not negatively impact predator-prey relationships.	The majority of the Project is located in active agricultural lands. Due to monoculture vegetation and constant disturbance, these lands do not support a robust small mammal prey base. The National Electric Code requires security fencing around solar facilities. The specifications for security fencing make this fence type exclusionary for large animals such as mule deer, but small animals such as mice, reptiles, and amphibians will have permeability through the chain link fencing and other small to medium-sized animals, such as rabbits, coyote, fox, bobcat, etc., will have potential permeability by digging under or finding areas in which the fence does not sit flush upon the ground surface. It is understood that once construction is completed, conditions will change for potential wildlife use within the fenced solar arrays, for instance, PV panels could serve as shelter for some animals against predators, especially aerial ones, and the fencing may have the effect of protecting smaller prey by keeping out larger terrestrial predators (Cypher et al., 2019); the fencing may aid in plant regrowth providing food and cover for small animals. However, the fencing is not expected to significantly influence the predator-prey dynamics. *Reference: Cypher, B.L., T.L. Westall, K.A. Spencer, D.E. Meade, E.C. Kelly, J. Dart, and C.L. van Horn Job. 2019. Response of San Joaquin kit foxes to topaz solar farms: Implications for conservation of kit foxes. Final Report prepared for: BHE Renewables Topaz Solar Farms.*
DR-WLF-04	**Wildlife**	ASC	Will buffers to special status species (e.g., gray squirrel) consider potential indirect effects from the project?	The purpose of establishing buffers between the Project and special status or listed species habitat is to mitigate for any potential direct and indirect effects from the Project, either during construction or during the life of the Project. The Project footprint was modified to avoid occupied western gray squirrel nesting habitat and by proxy also avoid any occupied or potentially occupied wild turkey habitat within the Ponderosa Pine Forest and Woodlands habitat type located on private lands adjacent to but outside of the MPE. Known nesting habitat will be protected by a permanent year-round 50-foot buffer and, to the extent practicable, a seasonal 400-foot buffer between March 1 to August 31 will be maintained from known nesting habitat to protect squirrels from disruptive activities during the breeding season as recommended by WDFW (Linders et al. 2010) (**Attachment WLF-2**). The Applicant is in the process of coordinating with WDFW on what types of project activities would be considered as disruptive activities but based on guidance from WDFW at the June 5, 2023 meeting, it would be possible to develop a phased construction approach so that very loud and intense construction activities would occur outside of the nesting period. This approach will need further internal review by the Applicant and additional review and guidance from WDFW on the phased approach once drafted. Guidance from WDFW regarding the year-round 50-foot buffer included that this is required for logging activities and would not be required for the Carriger project; the Applicant, however, will be leaving the 50-foot buffer intact. *Reference: Linders, M. J., W. M. Vander Haegen, J. M. Azerrad, R. Dobson, and T. Labbe. 2010. Management Recommendations for Washington's Priority Species: Western Gray Squirrel. Washington Department of Fish and Wildlife, Olympia, Washington.*
			When will surveys be done to delineate buffers for gray squirrels?	Please see our response regarding western gray squirrels above. The purpose of the 50-foot buffer, and 400-foot buffer is to preclude the need for nesting squirrel surveys. It should be noted that the current known nesting locations of western gray squirrel were provided by WDFW and are located northeast of the Project site, outside of the Project's Site Control Boundary. The Applicant does not have access to the parcels where the known western gray squirrel nests are located. However, Project biologists walked the eastern edge of the Project survey area near the known western gray squirrel habitat during the May 2022 survey effort and observed a western gray squirrel nest/shelter in the forested area east of the Project. See Figure 3 in Attachment C of the ASC.
			How will nesting habitat for wild turkeys be mitigated during the outlined breeding period?	Nesting wild turkeys were not observed within the Project Survey Area during the Spring 2022 surveys. However, one turkey was observed from a public roadway near the Ponderosa Pine Forest and Woodlands habitat located off-site on private property northeast of the Project site (see Figure 3 in Attachment C of the ASC). Current routine and active agricultural practices within the Project may preclude wild turkeys from nesting on site with a predicted low potential for nesting in any type of appropriate habitat (Mackey 1982). Based on WDFW recommendations to minimize human disturbances between mid-February and early June within breeding and nesting habitat for wild turkey (Larsen et al. 2004), it is the intent of the Applicant to conduct ground-nesting migratory bird species surveys prior to construction should construction activities start or occur during the nesting period of wild turkeys and between March 1 and August 31 for all other potentially nesting migratory bird species. *References:* *Larsen, E.M., J. M. Azerrad, and N. Nordstrom, editors. 2004. Management recommendations for Washington's Priority Species, Volume IV: Birds. Washington Department of Fish and Wildlife, Olympia, Washington, USA.* *Mackey, D. L. 1982. Ecology of Merriam's turkeys in south central Washington with special reference to habitat utilization. Thesis, Washington State University, Pullman, Washington, USA.*
DR-WLF-05	**Wildlife**	ASC	Is the site along a bird or bat migratory corridor?	The Project is not sited near any Important Bird Areas (IBA) which are identified as the most important sites for breeding, wintering, and/or migrating birds. The nearest IBAs are Columbia Hills and Conboy National Wildlife Refuge which are approximately 6 miles to the south and 20 miles to the northwest, respectively. Long-distance bird migration is often characterized by nocturnal flights and diurnal stopovers with most of the duration of the migratory journey spent at stopover sites (Alerstam, 2003). eBird data were used to examine species distribution, abundance, and stopover sites for migratory birds. There are 307 bird species known to occur in Klickitat County made up of mostly waterfowl, shorebirds, songbirds, and raptors (Fink et al. 2022). There are four eBird hotspots within 2 miles of the Project: Cunliff Road, Blockhouse, Goldendale sewage ponds, Mountain View Cemetery, and Goldendale Trout Hatchery. The number of species observed at these sites varied from 37 to 123 species (Fink et al. 2022). Most of the observations included single individuals or small flocks (<100 individuals), but larger flocks (100-800 individuals) of common widespread species (e.g.,

				American robin, horned lark, dark-eyed junco, European startling, least sandpiper, Canada goose, northern pintail, green-winged teal, and mallard) were occasionally observed (Fink et al. 2022). Migrating birds are more likely to stop over at other hotspots in the region that support a greater abundance and diversity of birds such as Centerville Valley, Swale Creek, Conboy Lake National Wildlife Refuge, or those along the Columbia River. Additionally, migratory birds are more likely to occur in the trees and shrubs on the edges of the Project site than the agricultural lands within the Project Area. Riparian areas will be avoided by the Project and no open water will be removed by the Project. Therefore, the Project would have a negligible effect on bird migration. Bats are relatively short-distance migrators. Many bat species may undertake seasonal migration within the region as they travel between wintering and summering locations, but few data exist on the extent and destination of such movements. During winter months, bats in the Pacific Northwest either migrate to southern regions where insects are available or to a local cave to hibernate. In general, bats in Washington do not hibernate in large aggregations like bats do in eastern North America. Migratory tree bats such as hoary bats and silver-haired bats are primarily solitary tree dwellers that do not hibernate. Long-distance movements may be associated with bats seeking favorable temperature and humidity conditions for roosting and foraging. Washington bats occupy a variety of roost structures including cavernous structures, such as caves, mines, and buildings; in and under bridges; in crevices of rocks, trees, and under loose bark; and in tree hollows and foliage. All bats in Washington eat insects. The presence of open water is important for bats, not only for drinking but also for foraging because of the high availability of insects. Riparian areas will be avoided by the Project and no open water will be removed by the Project. Therefore, the Project would have a negligible effect on bat migration. *Reference: Alerstam, T. and A. Lindstrom. 1990. Optimal bird migration: The relative importance of time, energy, and safety. In: Bird Migration (ed Gwinner, E.). Springer, Berlin, Heidelberg, pp. 331–351.* *Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligocki, O. Robinson, W. Hochachka, L. Jaromczyk, A. Rodewald, C. Wood, I. Davies, A. Spencer. 2022. eBird Status and Trends, Data Version: 2021; Released: 2022. Cornell Lab of Ornithology, Ithaca, New York. https://doi.org/10.2173/ebirdst.2021*
DR-WLF-06	**Wildlife**	ASC	Discuss impacts to general wildlife guilds. For example, small mammals are a food source for raptors; will burrows be impacted?	Outside of State listed and PHS species and habitat and Federal listed species or critical habitat, there are no regulatory requirements to protect or mitigate for impacts to general wildlife species. This topic has been addressed above in DR-WLF-04.
DR-WLF-07	**Wildlife**	ASC	Bald eagles were identified as potentially occurring near the project. Include a detailed description of the likelihood of bald eagle occurrence and how this was determined.	As stated in the Habitat and General Wildlife Survey Report and Raptor Nest Survey Report there is a low likelihood of bald eagles occurring at the Project; bald eagles were not observed during the raptor nest survey conducted in Spring 2022. In Washington, bald eagles nest primarily along marine shorelines and major rivers in the western and northeastern parts of the state. Nesting bald eagles are rare or absent from the Columbia Basin and southeastern Washington (WDFW 2022), however they have been documented to occur during the winter months. Potential bald eagle nesting habitat includes large trees, often near coastal areas, river systems, reservoirs, lakes, bays, or other bodies of water with their primary food sources, such as fish, waterfowl, or seabirds. In the area around the Project, there have been multiple single sighting eBird documented observations of bald eagles between 2016 and 2023 (Fink et al. 2022). The closest occurring observations to the Project are from February of 2019 to the northwest; March 2023 at the Goldendale Fish Hatchery to the west; December 2016 and 2018 along the Little Klickitat River to the south; and February of 2022 and March of 2023 near the Little Klickitat River to the east (eBird 2023). Direct or indirect impacts to over-wintering bald eagles from Project construction and operations and maintenance activities are considered low due to the very limited potential for occurrence of bald eagles around the Project site. *References:* *eBird. 2023. Bald Eagle. Website accessed on 6/2/23. https://ebird.org/map/baleag?env.minX=-179.99999999291&env.minY=16.9397716157348&env.maxX=179.326113654898&env.maxY=73.4067412181169* *Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligocki, O. Robinson, W. Hochachka, L. Jaromczyk, A. Rodewald, C. Wood, I. Davies, A. Spencer. 2022. eBird Status and Trends, Data Version: 2021; Released: 2022. Cornell Lab of Ornithology, Ithaca, New York. https://doi.org/10.2173/ebirdst.2021* *WDFW. 2022. State Listed Species and State Candidate Species, Revised March 2022. Available online at: https://wdfw.wa.gov/sites/default/files/2022-04/StateListed%26amp%3BCandidateSpecies28Mar2022.pdf Accessed July 2022.*
DR-WLF-08	**Wildlife**	ASC	Provide an evaluation of how the project will impact water quality and quantity and air quality at Goldendale Fish Hatchery, and groundwater supply.	The Project has been designed to avoid direct and indirect impacts to surface water quality, ground water quality, and air quality at not only the Goldendale Fish Hatchery but at all other properties adjacent to and within the Project or downstream of the Project. The following measures will be implemented to mitigate direct and indirect impacts from Project construction and O&M activities: • Surface water quality and quantity: ○ The Project's MPE was developed to specifically avoid impacts to streams and wetlands by conforming with State and local (Critical Area Ordinance) requirements for buffers and setbacks. ○ The Project design incorporates measures to address stormwater runoff during construction and post-construction. As stated in Section 4.5.C.1 of the ASC, the Project will prepare an Erosion and Sediment Control Plan (ESCP), a Construction Phase Stormwater Pollution Prevention Plan (SWPPP), Operations SWPPP, and Project Vegetation Management Plan. Ecology's 2019 Stormwater Management Manual for Eastern Washington (SWMMEW) will be used to provide guidance for planning, designing, and implementation of stormwater management practices tailored specifically for construction projects in this region. ○ The Project will develop a Spill Prevention, Control, and Countermeasure (SPCC) plan to address the risk of spills or leaks of petroleum-based products from equipment and supplies that could add pollutants to stormwater runoff.

				○ Minimal grading is proposed in the solar array locations and where possible existing vegetation root structure will be left intact to enhance soil stability and infiltration rates. ○ Upon further investigation, it has been determined that water for construction will be purchased from a permitted off-site source (i.e., municipal water source or vendor with a valid water right) and hauled to the Project site. Water for operations may be sourced from an existing on-site well or diversion associated with a valid water right, but viability is still being explored. If water is sourced from an existing surface water diversion associated with a valid water right during Project operations, use of this water would be permitted through Ecology and mitigated appropriately to not cause significant effect to the surface water supply. Thus, regardless, no net increase in either total or consumptive water use will occur as a result of the Project construction or operation (as described in Part 3, Section 3.6 of the ASC). ○ As described in Part 3, Section 3.4 of the ASC, washing of solar panels, when required, would be done with water only, and no surfactants or other chemicals would be added. Because the panel wash water would not contain added chemicals and the water is expected to evaporate with only minimal amounts potentially reaching the ground, no adverse impacts to surface water or groundwater quality would occur, and therefore no mitigation would be required. • Ground water quality and quantity: ○ Based on the depth to groundwater observed during geotechnical investigations (Attachment K of the ASC), the Project is not expected to impact groundwater. The slight increase in impervious surfaces associated with the Project is not expected to impact recharge to groundwater or stream flows with the implementation of proposed mitigation measures. ○ Upon further investigation, it has been determined that water for construction will be purchased from a permitted off-site source (i.e., municipal water source or vendor with a valid water right) and hauled to the Project site. Water for operations may be sourced from an existing on-site well or diversion associated with a valid water right, but viability is still being explored. If water is sourced from an existing surface water diversion associated with a valid water right during Project operations, use of this water would be permitted through Ecology and mitigated appropriately to not cause significant effect to the surface water supply. Thus, regardless, no net increase in either total or consumptive water use will occur as a result of the Project construction or operation (as described in Part 3, Section 3.6 of the ASC). ○ As described in Part 3, Section 3.4 of the ASC, washing of solar panels, when required, would be done with water only, and no surfactants or other chemicals would be added. Because the panel wash water would not contain added chemicals and the water is expected to evaporate with only minimal amounts potentially reaching the ground, no adverse impacts to surface water or groundwater quality would occur, and therefore no mitigation would be required. • Air quality ○ Section 4.2. of the ASC discusses existing air quality, changes to existing conditions, and proposed BMPs for reducing potential impacts to air quality and monitoring measures for impacts to air quality. The proposed BMPs discussed in this section would avoid significant impacts to air quality from construction and O&M related activities within the Project, adjacent to the Project, and within the local area surrounding the Project.

Attachments

Attachment Noise-1: Revised Acoustic Assessment Report

Carriger Solar Project
Revised Acoustic Assessment Report

Prepared for:

Carriger Solar, LLC

Prepared by:

TETRA TECH

January 2023

UPDATED: June 5, 2023

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Figures

Acronyms and Abbreviations

Applicant	Carriger Solar, LLC
BESS	battery energy storage system
CadnaA	Computer-Aided Noise Abatement
dB	decibel
dBA	A-weighted decibel
dBL	linear decibel
EDNA	Environmental Designation for Noise Abatement
EFSEC	Energy Project Site Evaluation Council
EOZ	Energy Overlay Zone
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
Hz	hertz
ISO	International Organization for Standardization
KCC	Klickitat County Code
kV	kilovolt
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_P	sound pressure level
L_w	sound power level
MW	megawatt
NSR	noise sensitive receptor
µPa	microPascal
Project	Carriger Solar Project
PV	photovoltaic
Tetra Tech	Tetra Tech, Inc.
WAC	Washington Administrative Code

1.0 Introduction

The Carriger Solar Project (Project) proposed by Carriger Solar, LLC (the Applicant), a wholly owned subsidiary of Cypress Creek Renewables, LLC, is a proposed solar Photovoltaic (PV) electric generating facility that includes 160 megawatts (MW) of solar energy and 63 MW of battery energy storage on private lands in Klickitat County, Washington. The Project components include a solar array comprised of PV modules; pile-driven racking equipment; power inverters and transformers mounted on concrete pads; a collection system of cables; battery energy storage system; Project substation; and interconnection with the regional electric transmission system.

Tetra Tech, Inc. (Tetra Tech) has prepared this acoustic assessment for the Project, evaluating potential sound impacts relative to the applicable noise regulations prescribed in the Washington Administrative Code (WAC). The existing ambient acoustic environment was characterized based on land use, population density, and proximity to major roadways. An acoustic modeling analysis was conducted simulating sound produced during both construction and operation. Operational sound sources consisted primarily of the inverters, step-up transformers, battery storage, and transformer at the on-site substation. The overall objectives of this assessment were to 1) identify Project sound sources and estimate sound propagation characteristics, 2) computer-simulate sound levels using internationally accepted calculation standards, and 3) confirm that the Project will operate in compliance with the applicable noise regulations.

1.1 Project Area

The Project Lease Boundary is approximately 2,110 acres that encompasses 25 privately owned assessor parcels for which the Applicant has executed or is pursuing a lease agreement with the underlying property owner. The Project parcels are composed primarily of agricultural and rural residential land uses. Land within the Project Lease Boundary have been heavily disturbed by agricultural crops and livestock grazing. Land in the surrounding area is similarly used and zoned for agricultural and rural residences. State Route 142 is located at the southern boundary of the Project, and the Washington Department of Fish and Wildlife Goldendale Fish Hatchery is located on an adjacent parcel on the western edge of the Project. Other lands to the west of the Project are also proposed for development of an unrelated utility scale solar project.

The Project parcels are located in unincorporated Klickitat County in the Extensive Agricultural District and General Rural Zone. Within the General Rural Zone, uses of a “public utility nature” may be permitted as a conditional use as described in Klickitat County Code (KCC) 19.18.030.H. Within the Extensive Agricultural District, “utility facilities necessary for public service” may be permitted as a conditional use, as described in KCC 19.16.030.E. The southern portion of the Project (south of the line that divides Range 15 East Townships 4 and 5) is located in the Energy Overlay Zone (EOZ) (KCC 19.39). In the EOZ, solar energy facilities are a permitted use (KCC 19.39.4). A portion of the Project is located outside of the EOZ; therefore, the Project requires a Conditional Use Permit pursuant to the underlying zone(s), and the EOZ ordinance (KCC 19.39) does not apply. The preliminary design accounts for Project size, topography, and other constraints; however, the solar modules, supporting components, and precise layout of the solar array have not yet been finalized.

Figure 1 provides an overview of the Project Area and provides the locations of nearby residences, which are considered Noise Sensitive Receptors (NSRs).

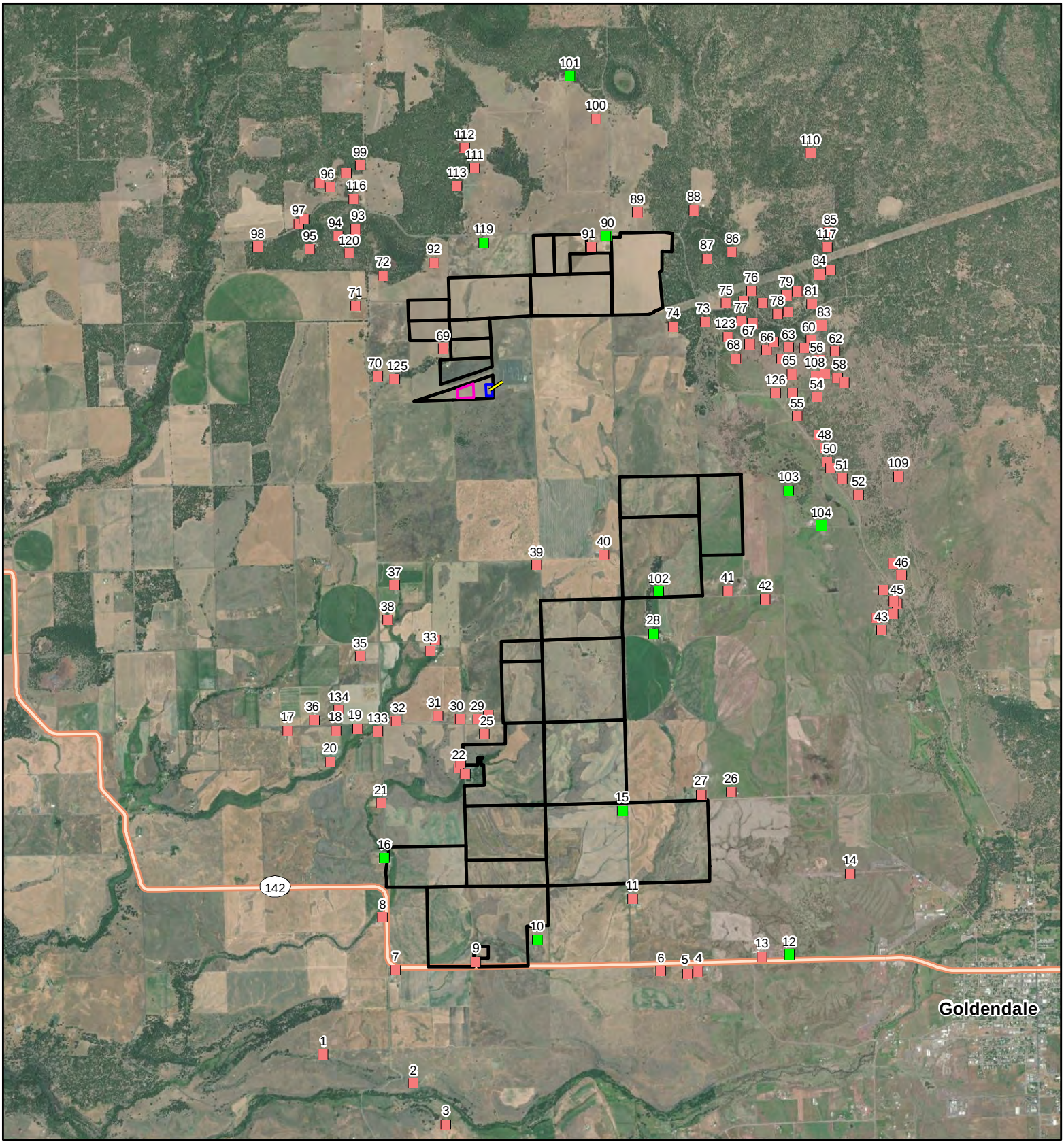

Figure 1
Project Area

Carriger Solar Project
Klickitat County, WA

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1.2 Acoustic Metrics and Terminology

All sounds originate with a source, whether it is a human voice, motor vehicles on a roadway, or a combustion turbine. Energy is required to produce sound, and this sound energy is transmitted through the air in the form of sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear. A sound source is defined by a sound power level (L_W), which is independent of any external factors. By definition, sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts.

A source sound power level cannot be measured directly. It is calculated from measurements of sound intensity or sound pressure at a given distance from the source outside the acoustic and geometric near-field. A sound pressure level (L_P) is a measure of the sound wave fluctuation at a given receiver location and can be obtained through the use of a microphone or calculated from information about the source sound power level and the surrounding environment. The sound pressure level in decibels (dB) is the logarithm of the ratio of the sound pressure of the source to the reference sound pressure of 20 microPascals (µPa), multiplied by 20.1. The range of sound pressures that can be detected by a person with normal hearing is very wide, ranging from about 20 µPa for very faint sounds at the threshold of hearing, to nearly 10 million µPa for extremely loud sounds such as a jet during take-off at a distance of 300 feet.

Broadband sound includes sound energy summed across the entire audible frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum can be completed to determine tonal characteristics. The unit of frequency is hertz (Hz), measuring the cycles per second of the sound pressure waves. Typically, the frequency analysis examines 11 octave bands ranging from 16 Hz (low) to 16,000 Hz (high). Since the human ear does not perceive every frequency with equal loudness, spectrally-varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system and is represented in A-weighted decibels (dBA).

Sound can be measured, modeled, and presented in various formats, with the most common metric being the equivalent sound level (L_{eq}). The L_{eq} has been shown to provide both an effective and uniform method for comparing time-varying sound levels and is widely used in acoustic assessments in the state of Washington. Estimates of noise sources and outdoor acoustic environments, and the comparison of relative loudness are presented in Table 1. Table 2 presents additional reference information on terminology used in the report.

Table 1. Sound Pressure Levels and Relative Loudness of Typical Noise Sources and Acoustic Environments

Noise Source or Activity	Sound Level (dBA)	Subjective Impression
Vacuum cleaner (10 feet)	70	Moderate
Passenger car at 65 miles per hour (25 feet)	65	
Large store air-conditioning unit (20 feet)	60	
Light auto traffic (100 feet)	50	Quiet
Quiet rural residential area with no activity	45	
Bedroom or quiet living room; Bird calls	40	Faint
Typical wilderness area	35	
Quiet library, soft whisper (15 feet)	30	Very quiet
Wilderness with no wind or animal activity	25	Extremely quiet
High-quality recording studio	20	
Acoustic test chamber	10	Just audible
	0	Threshold of hearing

Adapted from: Beranek (1988) and EPA (1971a)

Table 2. Acoustic Terms and Definitions

Term	Definition
Noise	Typically defined as unwanted sound. This word adds the subjective response of humans to the physical phenomenon of sound. It is commonly used when negative effects on people are known to occur.
Sound Pressure Level (LP)	Pressure fluctuations in a medium. Sound pressure is measured in dB referenced to 20 µPa, the approximate threshold of human perception to sound at 1,000 Hz.
Sound Power Level (LW)	The total acoustic power of a sound source measured in dB referenced to picowatts (one trillionth of a watt). Noise specifications are provided by equipment manufacturers as sound power as it is independent of the environment in which it is located. A sound level meter does not directly measure sound power.
Equivalent Sound Level (L_{eq})	The L_{eq} is the continuous equivalent sound level, defined as the single sound pressure level that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period.
A-Weighted Decibel (dBA)	Environmental sound is typically composed of acoustic energy across all frequencies. To compensate for the auditory frequency response of the human ear, an A-weighting filter is commonly used for describing environmental sound levels. Sound levels that are A-weighted are presented as dBA in this report.
Unweighted Decibels (dBL)	Unweighted sound levels are referred to as linear. Linear decibels are used to determine a sound's tonality and to engineer solutions to reduce or control noise as techniques are different for low and high frequency noise. Sound levels that are linear are presented as dBL in this report.
Propagation and Attenuation	Propagation is the decrease in amplitude of an acoustic signal due to geometric spreading losses with increased distance from the source. Additional sound attenuation factors include air absorption, terrain effects, sound interaction with the ground, diffraction of sound around objects and topographical features, foliage, and meteorological conditions including wind velocity, temperature, humidity, and atmospheric conditions.

1.3 Noise Regulations and Guidelines

1.3.1 Federal Regulations

There are no federal noise regulations applicable to the Project.

1.3.2 Washington Administrative Code State Regulations

Environmental noise limits have been established by the Washington Administrative Code (WAC 173-60). WAC 173-60 establishes noise limits based on the Environmental Designation for Noise Abatement (EDNA) of the sound source and the receiving properties.

- Class A EDNA – Lands where people reside and sleep. They typically include residential property; multiple family living accommodations; recreational facilities with overnight accommodations such as camps, parks, camping facilities, and resorts; and community service facilities including orphanages, homes for the aged, hospitals, and health and correctional facilities.
- Class B EDNA – Lands involving uses requiring protection against noise interference with speech. These typically will include commercial living accommodations; commercial dining establishments; motor vehicle services; retail services; banks and office buildings; recreation and entertainment property not used for human habitation such as theaters, stadiums, fairgrounds, and amusement parks; and community service facilities not used for human habitation (e.g., educational, religious, governmental, cultural and recreational facilities).
- Class C EDNA –Lands involving economic activities of a nature that noise levels higher than those experienced in other areas are normally to be anticipated. Typical Class A EDNA uses generally are not permitted in such areas. Typically, Class C EDNA include storage, warehouse, and distribution facilities; industrial property used for the production and fabrication of durable and nondurable man-made goods; and agricultural and silvicultural property used for the production of crops, wood products, or livestock.

Land use that is considered agricultural is defined as Class C receiving properties. Conversely, agricultural properties where their principal use is for residential purposes with no clearly visible farming or ranching activities, are identified as Class A receiving properties. The WAC does maintain flexibility for interpretation in the classification of the appropriate EDNA on both the state and local level. In this assessment, receiving properties consist of Class C lands and Class C Lands containing Class A residential structures. This assessment conservatively assumes all NSRs are Class A receiving properties. Between the hours of 10:00 p.m. and 7:00 a.m., the noise limitations are reduced by 10 dBA for receiving property within Class A EDNAs. WAC 173.60.050 exempts temporary construction noise from the state noise limits.

The noise level limits by EDNA classifications are presented in Table 3. The WAC allows these limits to be exceeded for certain periods of time: 5 dBA for no more than 15 minutes in any hour, 10 dBA for no more than 5 minutes of any hour, and 15 dBA for no more than 1.5 minutes of any hour; these

are commonly presented as L_n statistical sound levels as well as maximum sound levels (L_{max}), as shown in Table 4.

Table 3. Washington State Environmental Noise Limits

EDNA of Source Property	EDNA of Receiving Property		
	Class A Land Day/Night	Class B Land	Class C Land
Class A Land	55/45	57	60
Class B Land	57/47	60	65
Class C Land	60/50	65	70

Source: WAC 173-60-040

Table 4. L_n Environmental Noise Limits for Class C Sources

EDNA of Source Property	Statistical Sound Level Limits			
	LN_{25}	$LN_{8.3}$	$LN_{2.5}$	L_{MAX}
Class A Land	60/50	65/55	70/60	75/65
Class B Land	65	70	75	80
Class C Land	70	75	80	85

Source: WAC 173-60-040 (b) and (c)

The Project site is located on Class C land and also abuts Class C Land and Class C Land containing Class A residential structures. Table 3 shows that the applicable daytime and nighttime noise limits will vary based on each abutting land use class. This analysis conservatively considers Class C lands containing non-participating residences to be evaluated using the Class A WAC limits. For Class C land containing non-participating residential structures, limits of 60 dBA and 50 dBA apply to daytime and nighttime hours, respectively. For Class C land containing participating Class A residential structures, the daytime limit of 60 dBA and the nighttime limit of 50 dBA may be waived. For Class C land, a daytime and nighttime limit of 70 dBA is applicable. ~~For Class A land, limits of 60 dBA and 50 dBA apply to daytime and nighttime hours, respectively, and for Class C land, a daytime and nighttime limit of 70 dBA is applicable.~~ The WAC regulatory limits are absolute and independent of the existing acoustic environment; therefore, a baseline noise survey is not requisite to determine conformance.

1.3.3 Klickitat County Code

Chapter 9.15.050 in the KCC refers to WAC Chapter 173-60 for noise regulations.

2.0 Existing Sound Environment

The degree of audibility of a new or modified sound source is dependent in a large part on the relative level of the ambient noise. A range of noise settings occurs within the Project Area. Variations in acoustic environment are due in part to existing land uses, population density, and proximity to transportation corridors. Elevated existing ambient sound levels in the region occur near major transportation corridors such as interstate highways and in areas with higher population densities. Nearby rural airstrips and airports, including the Goldendale Municipal Airport and Piper Canyon Airport, also contribute to ambient noise levels in both surrounding urban and rural areas. Principal contributors to the existing acoustic environment likely include motor vehicle traffic, mobile farming equipment, all-terrain vehicles, local roadways, periodic aircraft flyovers, and natural sounds such as birds, insects, and leaf or vegetation rustle during elevated wind conditions. Diurnal effects result in sound levels that are typically quieter during the night than during the daytime, except during periods when evening and nighttime insect noise dominates in warmer seasons.

The analysis area is inclusive of all areas that could be potentially affected by construction or operational noise resulting from the Project. The analysis area for noise around the Project was defined as the area bounded by a perimeter extending approximately 1.2 miles (2 kilometers) from the Solar Siting Area. In the absence of ambient measurement data, the existing sound level environment in the vicinity of the Project was estimated with a method published by the Federal ~~Highway~~ Transit Administration (~~FHWA~~FTA) in its Transit Noise and Vibration Impact Assessment Manual (~~FHWA 2006~~FTA 2018). This document presents the general assessment of existing noise exposure based on the population density per square mile and proximity to area sound sources such as roadways and rail lines.

The proposed Project is approximately 2 miles (3.2 kilometers) northwest of the city of Goldendale, which has a population density of 3,453 per square mile according to the U.S. Census Bureau (2020). Table 5 indicates the estimated baseline sound levels based on population density for daytime, evening, and nighttime L_{eq} as well as the day-night average sound level (L_{dn}). The L_{dn} is the average equivalent sound level over a 24-hour period, with a penalty added for noise during the nighttime hours of 10:00 p.m. – 7:00 a.m. During the nighttime period, 10 dB is added to reflect the impact of the noise.

Table 5. Estimated Baseline Sound Levels in Proximity to the Project

Average Sound Level (dBA)	L_{eq} (Day)	L_{eq} (Evening)	L_{eq} (Night)	L_{dn}
	55	50	45	55

3.0 Project Construction

Construction of the Project is expected to be typical of other solar power generating facilities in terms of schedule, equipment, and activities. Construction is anticipated to occur over approximately 12 to 24 months and would require a variety of equipment and vehicles.

3.1 Noise Calculation Methodology

Acoustic emission levels for activities associated with Project construction were based on typical ranges of energy equivalent noise levels at construction sites, as documented by the U.S. Environmental Protection Agency (EPA; 1971b) and the EPA's "Construction Noise Control Technology Initiatives" (EPA 1980). Using those energy equivalent noise levels as input to a basic propagation model, construction noise levels were calculated at a series of set reference distances. The noise levels were input to a CadnaA (Computer-Aided Noise Abatement) noise ~~model, and~~model and resulting construction levels were calculated at nearby receivers.

3.2 Projected Noise Levels During Construction

Construction work will not consist of a phased approach. Table 6 summarizes the expected equipment to be used during Project construction. Table 6 also shows the maximum noise level at 50 feet ~~and the usage factor percentage for the expected equipment phases~~. For the purposes of the construction acoustic modeling analysis the usage factor of all equipment was conservatively assumed to be 100 percent.

Table 6. Project Construction Noise Levels

Construction Equipment	Usage Factor Percentage	Maximum (L_{max}) Equipment Noise Level at 50 feet, dBA
~~Bull Dozer~~Bulldozer	100	85
Excavator	100	85
Pile Driver	100	101
~~Fork Lift~~Forklift	100	85
Total	100	101

Table 7 shows the projected noise levels from Project construction at nearby NSRs. Periodically, sound levels may be higher or lower than those presented in Table 7; however, the overall sound levels should generally be lower due to excess attenuation and the trend toward quieter construction equipment in the intervening decades since the EPA data were developed.

The construction of the Project may cause short-term, but unavoidable, noise impacts that could be loud enough at times to temporarily interfere with speech communication outdoors, and indoors

with windows open. Noise levels resulting from the construction activities would vary significantly depending on several factors such as the type and age of equipment, specific equipment manufacturer and model, the operations being performed, and the overall condition of the equipment and exhaust system mufflers.

Project construction would generally occur during the day, Monday through Friday. Furthermore, all reasonable efforts would be made to minimize the impact of noise resulting from construction activities including implementation of standard noise reduction measures. Due to the infrequent nature of loud construction activities at the site, the limited hours of construction, and the implementation of noise mitigation measures, the temporary increase in noise due to construction is considered to be a less than significant impact.

Table 7. Received Project Construction Noise Levels, dBA L_{eq}

NSR ID	Participation Status	Distance to Construction (feet)	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, dBA
			Easting	Northing	
1	Non-Participant	4,488	662039	5075841	58
2	Non-Participant	3,834	662935	5075557	59
3	Non-Participant	5,140	663257	5075150	57
4	Non-Participant	3,722	665766	5076669	69
5	Non-Participant	3,579	665663	5076650	70
6	Non-Participant	3,118	665398	5076674	72
7	Non-Participant	1,077	662763	5076684	73
8	Non-Participant	1,111	662628	5077207	73
9	Non-Participant	99	663557	5076769	86
10	Participant	343	664169	5076989	83
11	Non-Participant	589	665118	5077393	83
12	Participant	5,783	666676	5076837	64
13	Non-Participant	5,025	666405	5076814	65
14	Non-Participant	7,262	667283	5077646	64
15	Participant	58	665016	5078267	86
16	Participant	382	662650	5077803	74
17	Non-Participant	5,128	661686	5079068	66
18	Non-Participant	4,249	662165	5079069	69
19	Non-Participant	4,048	662384	5079088	70

Table 7. Received Project Construction Noise Levels, dBA L_{eq}

NSR ID	Participation Status	Distance to Construction (feet)	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, dBA
			Easting	Northing	
20	Non-Participant	3,461	662107	5078756	68
21	Non-Participant	1,492	662615	5078344	69
22	Non-Participant	1,243	663389	5078691	75
23	Non-Participant	1,424	663410	5078749	75
24	Non-Participant	1,041	663457	5078635	76
25	Non-Participant	2,054	663643	5079033	78
26	Non-Participant	3,445	666100	5078457	74
27	Non-Participant	2,464	665801	5078430	75
28	Participant	1,194	665324	5080031	86
29	Non-Participant	2,272	663575	5079179	78
30	Non-Participant	2,840	663402	5079182	75
31	Non-Participant	3,074	663181	5079214	74
32	Non-Participant	3,571	662766	5079161	72
33	Non-Participant	3,773	663104	5079860	74
34	Non-Participant	3,597	663155	5079973	74
35	Non-Participant	5,961	662411	5079805	70
36	Non-Participant	4,874	661956	5079172	68
37	Non-Participant	5,090	662755	5080515	72
38	Non-Participant	5,154	662684	5080169	71
39	Non-Participant	1,318	664164	5080716	82
40	Non-Participant	588	664834	5080818	90
41	Non-Participant	868	666068	5080458	86
42	Non-Participant	1,659	666440	5080374	80
43	Non-Participant	5,179	667595	5080069	68
44	Non-Participant	4,847	667544	5080191	69
45	Non-Participant	5,303	667750	5080336	67
46	Non-Participant	5,258	667797	5080611	68

Table 7. Received Project Construction Noise Levels, dBA L_{eq}

NSR ID	Participation Status	Distance to Construction (feet)	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, dBA
			Easting	Northing	
47	Non-Participant	4,929	667708	5080733	71
48	Non-Participant	2,905	667031	5081881	73
49	Non-Participant	2,892	666973	5082010	74
50	Non-Participant	2,859	667051	5081738	74
51	Non-Participant	3,327	667204	5081577	73
52	Non-Participant	3,854	667369	5081415	72
54	Non-Participant	3,576	666952	5082386	76
55	Non-Participant	2,688	666758	5082197	75
56	Non-Participant	4,545	666971	5082750	74
57	Non-Participant	4,316	667031	5082618	74
58	Non-Participant	4,499	667160	5082576	73
59	Non-Participant	4,560	667226	5082533	73
60	Non-Participant	4,936	666891	5082950	70
61	Non-Participant	4,661	666829	5082875	72
62	Non-Participant	5,089	667131	5082840	72
63	Non-Participant	4,291	666669	5082879	72
64	Non-Participant	4,040	666600	5082768	73
65	Non-Participant	3,715	666704	5082615	76
66	Non-Participant	3,635	666448	5082853	75
67	Non-Participant	3,054	666282	5082915	76
68	Non-Participant	2,879	666146	5082772	79
69	Non-Participant	228	663236	5082867	95
70	Non-Participant	1,496	662585	5082594	82
71	Non-Participant	1,726	662360	5083295	78
72	Non-Participant	1,146	662636	5083597	82
73	Non-Participant	1,444	665840	5083134	78
74	Non-Participant	664	665524	5083091	84

Table 7. Received Project Construction Noise Levels, dBA L_{eq}

NSR ID	Participation Status	Distance to Construction (feet)	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, dBA
			Easting	Northing	
75	Non-Participant	2,064	666046	5083321	78
76	Non-Participant	2,903	666303	5083444	72
77	Non-Participant	2,577	666197	5083150	75
78	Non-Participant	3,757	666564	5083214	74
79	Non-Participant	3,984	666644	5083403	70
80	Non-Participant	4,281	666753	5083442	67
81	Non-Participant	4,863	666901	5083311	68
82	Non-Participant	4,090	666666	5083236	70
83	Non-Participant	5,203	666997	5083101	70
84	Non-Participant	4,865	666974	5083610	68
85	Non-Participant	5,121	667065	5084022	67
86	Non-Participant	1,959	666105	5083833	65
87	Non-Participant	1,174	665859	5083765	83
88	Non-Participant	1,060	665731	5084246	82
89	Non-Participant	664	665162	5084224	85
90	Participant	174	664851	5083988	89
91	Non-Participant	149	664706	5083877	91
92	Non-Participant	693	663141	5083726	87
93	Non-Participant	2,890	662360	5084060	74
94	Non-Participant	3,113	662185	5083992	73
95	Non-Participant	3,613	661906	5083857	75
96	Non-Participant	4,479	662109	5084475	70
97	Non-Participant	4,353	661797	5084111	69
98	Non-Participant	5,209	661388	5083880	68
99	Non-Participant	4,670	662409	5084694	71
100	Non-Participant	3,766	664758	5085158	76
101	Participant	5,181	664496	5085582	72

Table 7. Received Project Construction Noise Levels, dBA L_{eq}

NSR ID	Participation Status	Distance to Construction (feet)	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, dBA
			Easting	Northing	
102	Participant	0	665375	5080450	99
103	Participant	1,566	666671	5081459	84
104	Participant	2,610	666998	5081105	73
105	Non-Participant	1,911	663685	5079222	80
106	Non-Participant	4,298	661850	5084155	69
107	Non-Participant	2,640	666220	5083342	72
108	Non-Participant	4,078	666939	5082598	75
109	Non-Participant	5,168	667765	5081596	68
110	Non-Participant	5,238	666888	5084812	68
111	Non-Participant	2,904	663547	5084665	75
112	Non-Participant	3,625	663447	5084867	74
113	Non-Participant	2,958	663371	5084486	78
114	Non-Participant	4,608	662272	5084616	70
115	Non-Participant	4,802	662004	5084521	69
116	Non-Participant	3,748	662345	5084359	72
117	Non-Participant	5,073	667053	5083878	67
118	Non-Participant	5,217	667087	5083645	67
119	Participant	1,115	663638	5083922	87
120	Non-Participant	2,451	662298	5083814	79
121	Non-Participant	3,251	666409	5083321	73
122	Non-Participant	3,768	666522	5082941	74
123	Non-Participant	2,302	666065	5082988	79
124	Non-Participant	2,942	666305	5083122	75
125	Non-Participant	993	662756	5082565	84
126	Non-Participant	2,924	666543	5082424	77
127	Non-Participant	3,379	666587	5082556	77
128	Non-Participant	3,181	666710	5082425	75

Table 7. Received Project Construction Noise Levels, dBA L_{eq}

NSR ID	Participation Status	Distance to Construction (feet)	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, dBA
			Easting	Northing	
129	Non-Participant	2,955	667087	5081682	73
130	Non-Participant	4,754	667613	5080465	67
131	Non-Participant	5,189	667718	5080351	67
132	Non-Participant	5,304	667712	5080230	67
133	Non-Participant	3,757	662581	5079059	70
134	Non-Participant	4,818	662195	5079272	69
135	Non-Participant	336	662784	5083303	89
136	Non-Participant	572	662719	5083095	84

3.3 Construction Noise Mitigation

Since construction equipment operates intermittently, noise emitted during construction would be mobile and highly variable, making it challenging to control. The construction management protocols would include the following proposed noise mitigation measures to minimize noise impacts:

- Maintain all construction tools and equipment in good operating order according to manufacturers' specifications.
- Limit use of major excavating and earth-moving machinery to daytime hours.
- To the extent practicable, schedule construction activity during normal working hours on weekdays when higher sound levels are typically present and are found acceptable. Some limited activities, such as concrete pours, would be required to occur continuously until completion.
- Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks.
- For construction devices that utilize internal combustion engines, ensure the engine's housing doors are kept closed, and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible.
- Noise blankets or other similar materials to block noise will be used where and when applicable.
- Limit possible evening shift work to low noise activities such as welding, wire pulling, and other similar activities, together with appropriate material handling equipment.

- Utilize a complaint resolution procedure to address any noise complaints received from residents.

4.0 Operational Noise

This section describes the model used for the assessment, input assumptions used to calculate noise levels due to the Project's normal operation, a conceptual noise mitigation strategy, and the results of the noise impact analysis.

4.1 Noise Prediction Model

The CadnaA (Computer-Aided Noise Abatement) computer noise model was used to calculate sound pressure levels from the operation of the Project equipment in the vicinity of the Project site. An industry standard, CadnaA was developed by DataKustik GmbH (2020) to provide an estimate of sound levels at distances from sources of known emission. It is used by acousticians and acoustic engineers due to the capability to accurately describe noise emission and propagation from complex facilities consisting of various equipment types like the Project, and in most cases, yields conservative results of operational noise levels in the surrounding community.

The outdoor noise propagation model is based on the International Organization for Standardization (ISO) 9613, Part 2: "Attenuation of Sound during Propagation Outdoors" (1996). The method described in this standard calculates sound attenuation under weather conditions that are favorable for sound propagation, such as for downwind propagation or atmospheric inversion, conditions which are typically considered worst-case. The calculation of sound propagation from source to receiver locations consists of full octave band sound frequency algorithms, which incorporate the following physical effects:

- Geometric spreading wave divergence;
- Reflection from surfaces;
- Atmospheric absorption at 10 degrees Celsius and 70 percent relative humidity;
- Screening by topography and obstacles;
- The effects of terrain features including relative elevations of noise sources;
- Sound power levels from stationary and mobile sources;
- The locations of noise-sensitive land use types such as residential land uses;
- Intervening objects including buildings and barrier walls, to the extent included in the design;
- Ground effects due to areas of pavement and unpaved ground;
- Sound power at multiple frequencies;
- Source directivity factors;

- Multiple noise sources and source type (point, area, and/or line); and
- Averaging predicted sound levels over a given time.

CadnaA allows for three basic types of sound sources to be introduced into the model: point, line, and area sources. Each noise-radiating element was modeled based on its noise emission pattern. Larger dimensional sources such as the transformers and inverters were modeled as area sources.

Off-site topography was obtained using the publicly available U.S. Geological Survey digital elevation data. A default ground attenuation factor of 0.5 was assumed for off-site sound propagation over acoustically "mixed" ground.

The output from CadnaA includes tabular sound level results at selected receiver locations and colored noise contour maps (isopleths) that show areas of equal and similar sound levels.

4.2 Input to the Noise Prediction Model

The Project's general arrangement was reviewed and directly imported into the acoustic model so that on-site equipment could be easily identified, buildings and structures could be added, and sound emission data could be assigned to sources as appropriate. The primary noise sources during operations are the inverters, their integrated step-up transformers, battery energy storage system (BESS) units, and the substation transformer. The Project layout includes 44 step-up transformers and 44 inverters distributed throughout the solar array areas. BESS units will be positioned adjacent to the substation, and their associated sound emissions were considered in the acoustic analysis.

Substations have switching, protection, and control equipment, as well as a main power transformer, which generate the sound generally described as a low humming. There are three chief noise sources associated with a transformer: core noise, load noise, and noise generated by the operation of the cooling equipment. The core is the principal noise source and does not vary significantly with electrical load. The load noise is primarily caused by the load current in the transformer's conducting coils (or windings) and consequently the main frequency of this sound is twice the supply frequency: 120 Hz for 60 Hz transformers. The cooling equipment (fans and pumps) may also be an important noise component, depending on fan design. During air forced cooling method, cooling fan noise is produced in addition to the core noise. The resulting audible sound is a combination of hum and the broadband fan noise. Breaker noise is a sound event of very short duration, expected to occur only a few times throughout the year. Just as horsepower ratings designate the power capacity of an electric motor, a transformer's megavolt amperes rating indicates its maximum power output capacity.

Reference sound power levels input to CadnaA were provided by equipment manufacturers, based on information contained in reference documents or developed using empirical methods. The source levels used in the predictive modeling are based on estimated sound power levels that are generally deemed to be conservative. The projected operational noise levels are based on Applicant-supplied sound power level data for the major sources of equipment. Table 8 summarizes the equipment sound power level data ~~used as inputs to~~considered for the acoustic modeling analysis; however, the tracking motors were not incorporated due to their low sound power level. With a sound power level of 50 dBA, at a distance of 10 feet, ~~from~~ the resultant sound pressure level would be less than 29 dBA. Even though the Project incorporates a multitude of tracking motors,

their cumulative sound contribution is not expected to materially affect offsite received sound levels. The reason is ~~related~~due to both the low-level sound emissions of tracking motors and the logarithmic relationship between additive sound sources. Because the decibel scale is a logarithmic scale, ~~if we have~~ two different sound sources combining ~~together we~~ can't simply ~~add the sound power or pressure levels~~be added together arithmetically. For instance, two sound sources with a sound power level of 50 dBA result in a combined sound power level of 53 dBA, as opposed to 100 dBA. ~~-~~For the purpose of the analysis, it was assumed that all equipment would operate consistently during both daytime and nighttime periods.

Table 8. ~~Modeled~~ Octave Band Sound Power Level for Major Pieces of Project Equipment

Sound Source	Sound Power Level (L_W) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Step-up Transformer	98	102	98	98	98	92	87	81	74	98
Inverter	~~78~~117	~~86~~112	~~93~~109	~~94~~103	~~93~~96	~~90~~90	~~85~~84	~~78~~77	~~71~~72	99
BESS	85	93	100	101	100	97	92	85	78	106
Substation Transformer	98	102	98	98	98	92	87	81	74	98
Tracking Motor	72	59	53	50	48	45	40	36	34	50

Source: Siemens Energy Inc. 2020; SMA America LLC 2022; FlexGen 2022; and NEXTracker 2020.

In addition to the above, the modeling analysis accounts for the 500-foot-long 500-kilovolt (kV) transmission line located between the Project substation and the existing Knight substation. Transmission lines generate sound referred to as corona. The level of corona noise generated by a transmission line is highly dependent on weather conditions (i.e., foul weather), electrical gradient, altitude, and condition of the conductor wires. The corona effect is initiated where the conductor's electric field is concentrated by imperfections in the conductor surface such as nicks or scratches, or by substances on the lines such as water droplets, dirt or dust, and bird droppings. Corona activity increases with increasing altitude, and with increasing voltage in the line, but is generally not affected by system loading. Details pertaining the transmission line have not been finalized, but the audible sound level associated with transmission line operation under foul weather conditions was conservatively estimated at 69 dBA at a distance of 50 feet from the transmission line.

4.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. It is expected that all sound-producing equipment would operate during both daytime and nighttime periods. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. Table 9 shows the projected exterior sound levels resulting from full, normal operation of the Project under clear and rainy conditions~~during both daytime and nighttime hours~~, at all nearby NSRs.

Additionally, Ssound contour plots displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figures 2 and 3 for operations with the under clear and rainy conditions. The sound contours are graphical representations of the cumulative noise associated with full operation of the equipment and show how operational noise would be distributed over the surrounding area of the Project site. The contour lines shown are analogous to elevation contours on a topographic map (i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of sound).

Table 9 shows the projected exterior sound levels resulting from full, normal operation of the Project during both daytime and nighttime hours, at all nearby NSRs. As described in section 1.3.2, this analysis conservatively considers Class C lands containing non-participating residences to be evaluated using the Class A WAC limits. —Therefore, the Project is located on Class C land while the adjacent properties consist of a mix of lands classified as Class C and Class A. For Class C land containing non-participating residential structures, limits of 60 dBA and 50 dBA apply to daytime and nighttime hours, respectively. For Class C land containing participating Class A residential structures, the daytime limit of 60 dBA and the nighttime limit of 50 dBA may be waived. For Class C land, a daytime and nighttime limit of 70 dBA is applicable. In order to assess compliance, the modeled received sound levels relative to the Project Site Control Boundary must be reviewed. The modeled received sound levels displayed in Figures 2 and 3 related to the Site Control Boundary indicate successful compliance with the 50 dBA nighttime WAC sound limit at all abutting Class A lands and with the 70 dBA WAC sound limit at all abutting Class C lands.

The Project is located on Class C land while the adjacent properties consist of a mix of both Class C land with Class A residential structures, which has a daytime limit of 60 dBA and nighttime limit of 50 dBA, and Class C land, which has a daytime and nighttime limit of 70 dBA. The Project will be in compliance with the applicable noise regulations at all non-participating and participating receptors .

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, Clear Conditions (dBA)	Received Noise Level, Rainy Conditions (dBA)
		Easting	Northing		
1	Non-Participant	662039	5075841	31	31
2	Non-Participant	662935	5075557	32	32
3	Non-Participant	663257	5075150	28	28
4	Non-Participant	665766	5076669	37	37
5	Non-Participant	665663	5076650	38	38
6	Non-Participant	665398	5076674	38	38
7	Non-Participant	662763	5076684	41	41

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, Clear Conditions (dBA)	Received Noise Level, Rainy Conditions (dBA)
		Easting	Northing		
8	Non-Participant	662628	5077207	43	43
9	Non-Participant	663557	5076769	44	44
10	Participant	664169	5076989	46	46
11	Non-Participant	665118	5077393	45	45
12	Participant	666676	5076837	33	33
13	Non-Participant	666405	5076814	35	35
14	Non-Participant	667283	5077646	33	33
15	Participant	665016	5078267	53	53
16	Participant	662650	5077803	42	42
17	Non-Participant	661686	5079068	33	33
18	Non-Participant	662165	5079069	36	36
19	Non-Participant	662384	5079088	36	36
20	Non-Participant	662107	5078756	35	35
21	Non-Participant	662615	5078344	37	37
22	Non-Participant	663389	5078691	43	43
23	Non-Participant	663410	5078749	43	43
24	Non-Participant	663457	5078635	43	43
25	Non-Participant	663643	5079033	42	42
26	Non-Participant	666100	5078457	42	42
27	Non-Participant	665801	5078430	45	45
28	Participant	665324	5080031	43	43
29	Non-Participant	663575	5079179	41	41
30	Non-Participant	663402	5079182	40	40
31	Non-Participant	663181	5079214	39	39
32	Non-Participant	662766	5079161	38	38
33	Non-Participant	663104	5079860	36	36
34	Non-Participant	663155	5079973	36	36
35	Non-Participant	662411	5079805	34	34
36	Non-Participant	661956	5079172	34	34
37	Non-Participant	662755	5080515	35	35

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, Clear Conditions (dBA)	Received Noise Level, Rainy Conditions (dBA)
		Easting	Northing		
38	Non-Participant	662684	5080169	34	35
39	Non-Participant	664164	5080716	41	41
40	Non-Participant	664834	5080818	44	44
41	Non-Participant	666068	5080458	45	45
42	Non-Participant	666440	5080374	41	41
43	Non-Participant	667595	5080069	31	31
44	Non-Participant	667544	5080191	31	31
45	Non-Participant	667750	5080336	30	30
46	Non-Participant	667797	5080611	33	33
47	Non-Participant	667708	5080733	34	34
48	Non-Participant	667031	5081881	33	33
49	Non-Participant	666973	5082010	33	33
50	Non-Participant	667051	5081738	33	33
51	Non-Participant	667204	5081577	34	34
52	Non-Participant	667369	5081415	34	34
54	Non-Participant	666952	5082386	34	34
55	Non-Participant	666758	5082197	34	35
56	Non-Participant	666971	5082750	34	34
57	Non-Participant	667031	5082618	34	34
58	Non-Participant	667160	5082576	34	34
59	Non-Participant	667226	5082533	34	34
60	Non-Participant	666891	5082950	33	33
61	Non-Participant	666829	5082875	33	33
62	Non-Participant	667131	5082840	33	33
63	Non-Participant	666669	5082879	33	33
64	Non-Participant	666600	5082768	34	34
65	Non-Participant	666704	5082615	35	35
66	Non-Participant	666448	5082853	36	36
67	Non-Participant	666282	5082915	37	37
68	Non-Participant	666146	5082772	39	39

Table 9. Acoustic Modeling Results Summary

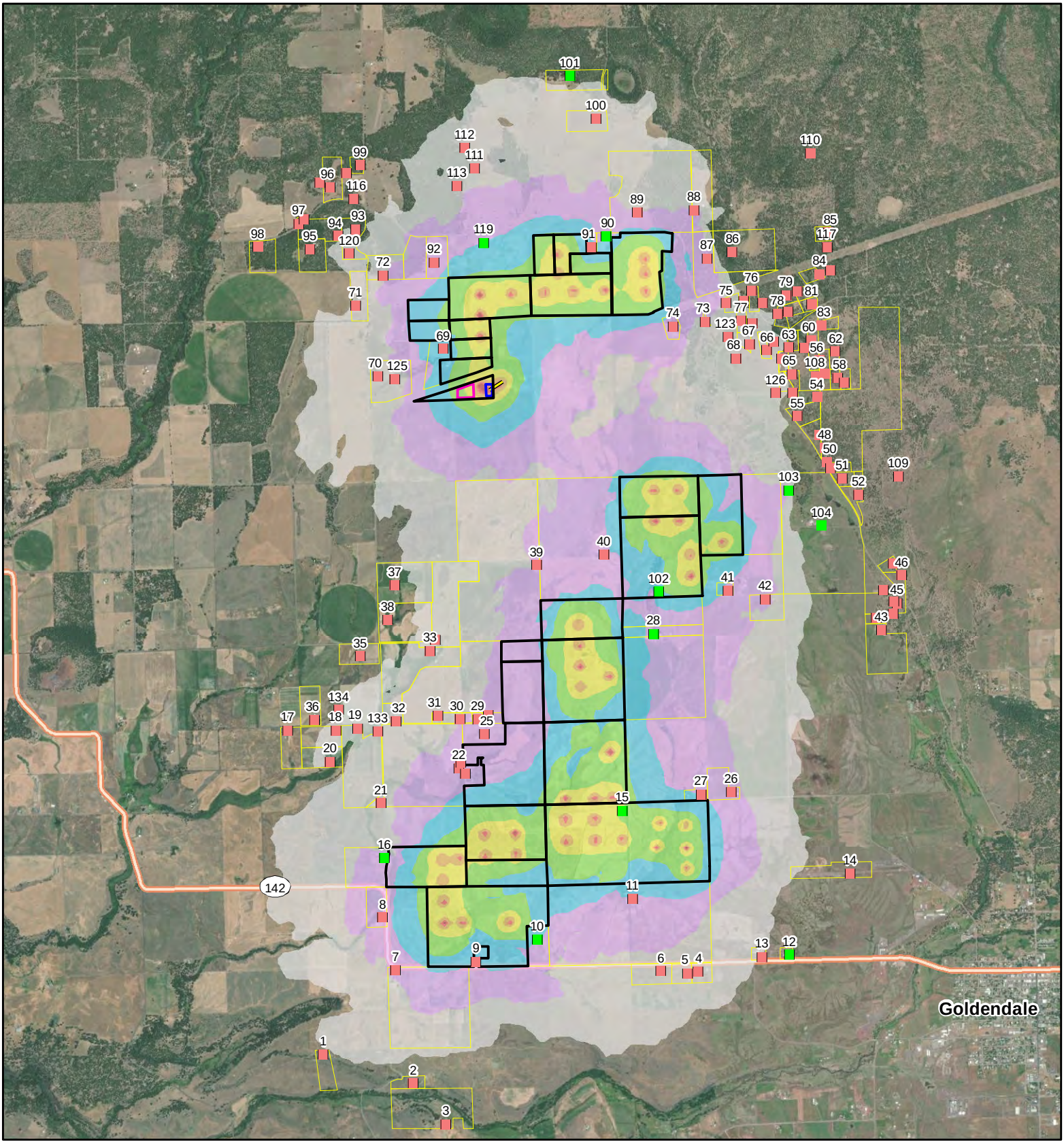
NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, Clear Conditions (dBA)	Received Noise Level, Rainy Conditions (dBA)
		Easting	Northing		
69	Non-Participant	663236	5082867	48	48
70	Non-Participant	662585	5082594	37	38
71	Non-Participant	662360	5083295	35	35
72	Non-Participant	662636	5083597	38	38
73	Non-Participant	665840	5083134	39	39
74	Non-Participant	665524	5083091	43	43
75	Non-Participant	666046	5083321	39	39
76	Non-Participant	666303	5083444	35	35
77	Non-Participant	666197	5083150	37	37
78	Non-Participant	666564	5083214	35	35
79	Non-Participant	666644	5083403	32	32
80	Non-Participant	666753	5083442	30	30
81	Non-Participant	666901	5083311	31	31
82	Non-Participant	666666	5083236	32	32
83	Non-Participant	666997	5083101	32	32
84	Non-Participant	666974	5083610	31	31
85	Non-Participant	667065	5084022	30	30
86	Non-Participant	666105	5083833	28	28
87	Non-Participant	665859	5083765	43	43
88	Non-Participant	665731	5084246	41	41
89	Non-Participant	665162	5084224	40	40
90	Participant	664851	5083988	44	44
91	Non-Participant	664706	5083877	46	46
92	Non-Participant	663141	5083726	43	43
93	Non-Participant	662360	5084060	34	34
94	Non-Participant	662185	5083992	33	33
95	Non-Participant	661906	5083857	33	33
96	Non-Participant	662109	5084475	31	31
97	Non-Participant	661797	5084111	30	30
98	Non-Participant	661388	5083880	30	31

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, Clear Conditions (dBA)	Received Noise Level, Rainy Conditions (dBA)
		Easting	Northing		
99	Non-Participant	662409	5084694	32	32
100	Non-Participant	664758	5085158	37	37
101	Participant	664496	5085582	35	35
102	Participant	665375	5080450	47	47
103	Participant	666671	5081459	40	40
104	Participant	666998	5081105	34	34
105	Non-Participant	663685	5079222	42	42
106	Non-Participant	661850	5084155	30	30
107	Non-Participant	666220	5083342	35	35
108	Non-Participant	666939	5082598	34	34
109	Non-Participant	667765	5081596	30	30
110	Non-Participant	666888	5084812	31	31
111	Non-Participant	663547	5084665	36	36
112	Non-Participant	663447	5084867	36	36
113	Non-Participant	663371	5084486	38	38
114	Non-Participant	662272	5084616	32	32
115	Non-Participant	662004	5084521	30	30
116	Non-Participant	662345	5084359	32	32
117	Non-Participant	667053	5083878	31	31
118	Non-Participant	667087	5083645	31	31
119	Participant	663638	5083922	45	45
120	Non-Participant	662298	5083814	35	36
121	Non-Participant	666409	5083321	34	34
122	Non-Participant	666522	5082941	36	36
123	Non-Participant	666065	5082988	39	39
124	Non-Participant	666305	5083122	37	37
125	Non-Participant	662756	5082565	39	39
126	Non-Participant	666543	5082424	36	36
127	Non-Participant	666587	5082556	36	36
128	Non-Participant	666710	5082425	35	35

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 10		Received Noise Level, Clear Conditions (dBA)	Received Noise Level, Rainy Conditions (dBA)
		Easting	Northing		
129	Non-Participant	667087	5081682	33	33
130	Non-Participant	667613	5080465	31	31
131	Non-Participant	667718	5080351	30	30
132	Non-Participant	667712	5080230	31	31
133	Non-Participant	662581	5079059	36	36
134	Non-Participant	662195	5079272	34	34
135	Non-Participant	662784	5083303	43	43
136	Non-Participant	662719	5083095	40	40



Project Lease Boundary Parcels
500 kV Transmission Line
BESS
Substation
Noise Sensitive Receptor
Participant
Non-Participant

Received Sound Levels (dBA)
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
> 70

N
0 0.5 1
Miles

Figure 2
Received Sound Levels - Clear Conditions

Carriger Solar Project
Klickitat County, WA

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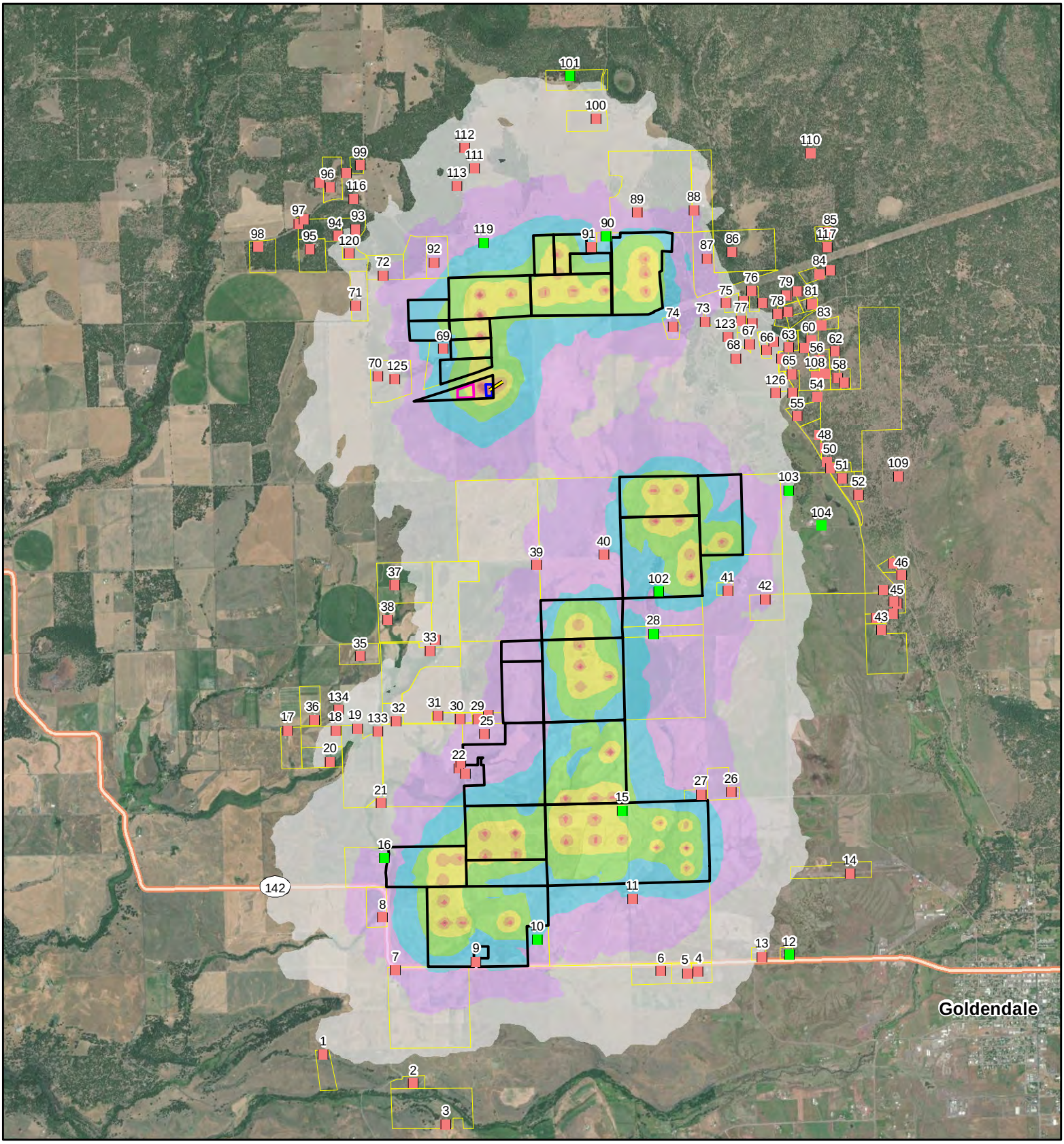

Project Lease Boundary Parcels
500 kV Transmission Line
BESS
Substation
Noise Sensitive Receptor
Participant
Non-Participant

Received Sound Levels (dBA)
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
> 70

N
0 0.5 1
Miles

Figure 3
Received Sound Levels - Rainy Conditions

Carriger Solar Project
Klickitat County, WA

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5.0 Conclusion

Tetra Tech completed a detailed acoustic assessment of the Carriger Solar Energy Project, proposed in Klickitat County, Washington. The assessment included an evaluation of potential Project sound level impacts during construction and operation phases.

The construction noise assessment indicated that construction noise would be periodically audible at off-site locations; however, that noise would be temporary and minimized to the extent practicable through implementation of best management practices and noise mitigation measures as identified in Section 3.3. Traffic noise generated during construction onsite and offsite would also add to overall sound levels but would be intermittent and short-term.

Operational sound levels were modeled and evaluated at nearby NSRs. Anticipated Project sound sources consist of the collector substation main power transformer, inverters, step-up transformers, BESS units, and the 500-kV transmission line. Incorporating a number of conservative assumptions, acoustic modeling results indicate that received sound levels resulting from Project operations would comply with the applicable WAC 173-60 50-dBA daytime and nighttime limits at ~~all NSRs,~~abutting Class A lands, as well as the Class C 70-dBA limit at ~~the Project boundary~~abutting Class C lands. In addition, sound generated from existing sound sources in the Project Area, such as the operation of agricultural equipment, would be expected to be relatively higher than Project operations. Overall, sound emissions associated with the Project are expected to remain at a low level, consistent with other solar energy facilities of similar size and design.

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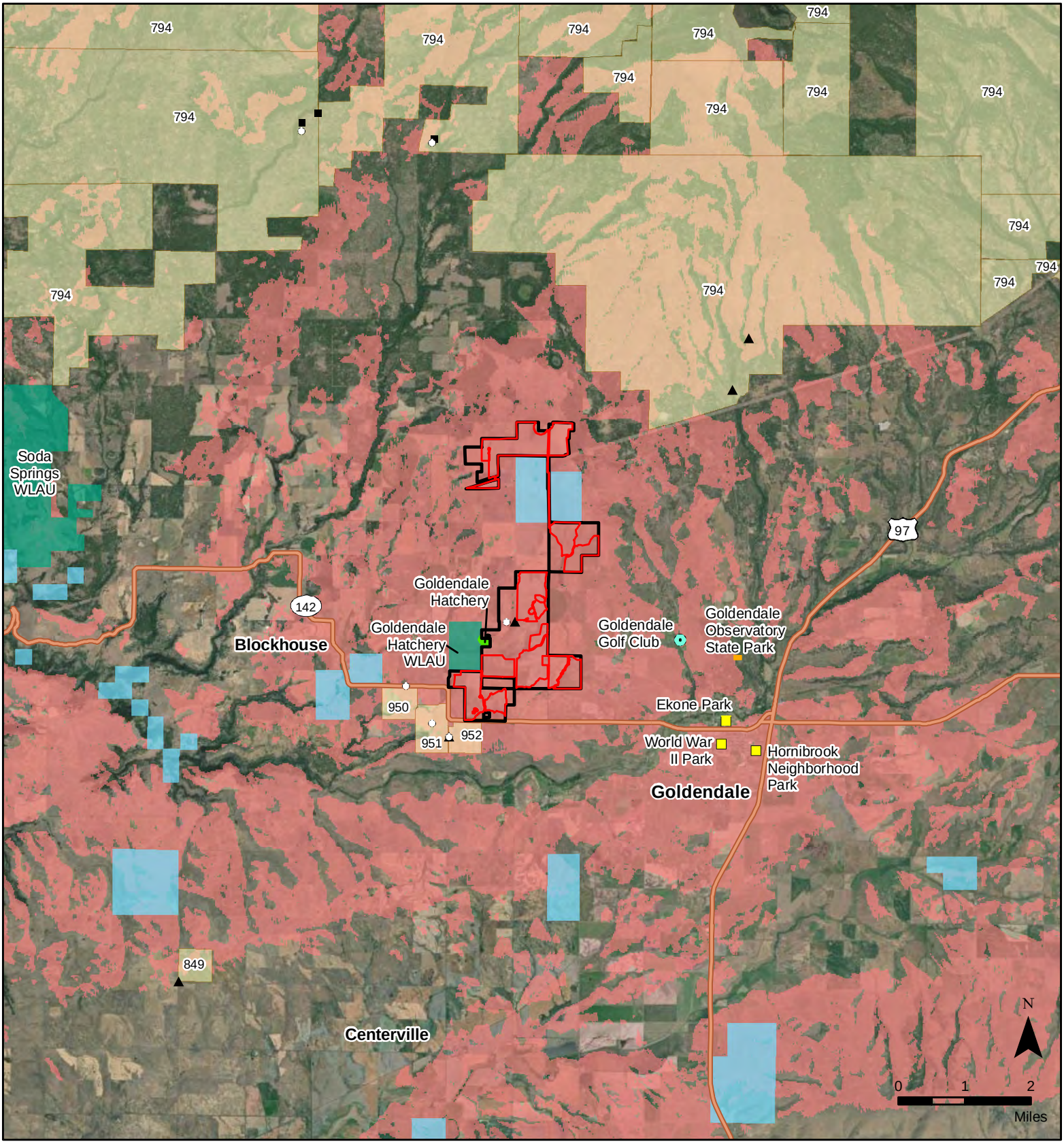
Attachment Rec-1: DR-REC-1 Response (figure and table)



Project Site Control Boundary
Maximum Project Extent (MPE)
Project Potentially Visible
Washington Dept. of Fish and Wildlife
Washington Dept. of Natural Resources
Goldendale Fish Hatchery
State Park
WDFW Private Land Hunting Access Program Parcels
Goldendale City Parks
Golf Course

Private Land Access
Gated Entry Point
Hunt Access Point
Parking Area Point

TETRA TECH

Figure DR-REC-1
Project Potential Visibility and Recreation Opportunities

Prepared for:
Carriger Solar, LLC Project
May 23, 2023

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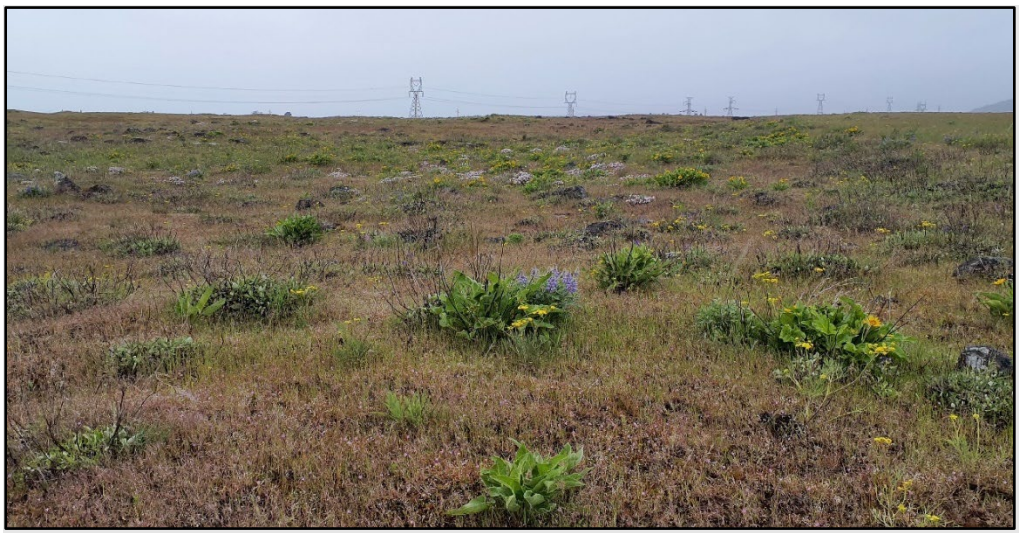
Recreation Opportunity	**Distance from Project Site Control Boundary (mi)**	
Ekone Park	2.2	
Hornibrook Neighborhood Park	2.8	
World War II Park	2.3	
Goldendale Golf Club	1.5	
Goldendale Observatory State Park	2.4	
Goldendale Fish Hatchery	abutting	
Private Land Hunting	abutting	
WDFW Klickitat Wildlife Area Complex - Goldendale Hatchery Unit	abutting	
WDFW Klickitat Wildlife Area Complex - Soda Springs Unit	5.8	
Private Land Hunting		**Land Access Type**
Western Pacific Timber – Goldendale (site #794)	0.8	Feel Free to Hunt
Finn Ridge Road (site #849)	5.1	Feel Free to Hunt
Spring Creek North (site #950)	0.5	Hunt By Reservation
Spring Creek Central (site #951)	0.3	Hunt By Reservation
Spring Creek East (site #952)	abutting	Hunt By Reservation

Attachment Veg-1: Draft Vegetation Management Plan for the Carriger Solar, LLC Project

DRAFT
Vegetation Management Plan for the Carriger Solar, LLC Project

Prepared for:

Cypress Creek Renewables, LLC
3402 Pico BLVD.
Santa Monica, CA 90405



Prepared by:

TETRA TECH

June 16, 2023

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Appendices

Acronyms and Abbreviations

AC	alternating current
ASC	Application for Site Certificate
BESS	battery energy storage system
BPA	Bonneville Power Administration
CCR	Cypress Creek Renewables, LLC
EFSEC	Washington State Energy Facility Site Evaluation Council
MPE	Maximum Project Extent
MW	megawatts
O&M	operations and maintenance
PV	photovoltaic
Project	Carriger Solar Project
RCW	Revised Code of Washington
SR	State Route
Tetra Tech	Tetra Tech, Inc.
USEPA	U.S. Environmental Protection Agency
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSNWCB	Washington State Noxious Weed Control Board

1.0 Introduction

Carriger Solar, LLC (CCR), a wholly owned subsidiary of Cypress Creek Renewables, LLC, proposes to construct and operate the Carriger Solar Project (Project) located in unincorporated Klickitat County, Washington. Tetra Tech, Inc. (Tetra Tech) and CCR have developed this Vegetation Management Plan in support of siting and permitting for an Application for Site Certification (ASC) to the Washington State Energy Facility Site Evaluation Council (EFSEC) for the proposed Project.

1.1 Project Description

The Project is located in unincorporated Klickitat County, Washington, on land composed primarily of agricultural and rural residential lands. The Project is generally located north of State Route (SR) 142 and along Knight Road, Fairgrounds Road West, Mesecher Road West, Fish Hatchery Road, Butts Road, and Pine Forest Road approximately 2 miles west/northwest of the city of Goldendale (see Figure 1).

The Project Site Control Boundary contains 2,108 acres and is composed of two non-contiguous areas across 25 privately owned parcels. Within the Project Site Control Boundary, a smaller 2,011-acre Project Study Area was defined for biological, cultural, and physical resource surveys. The Project Study Area includes all areas under consideration for Project development. Within the Project Study Area, a smaller area will be permanently or temporarily disturbed by Project construction and is referred to as the Maximum Project Extent (MPE; 1,326 acres). The MPE contains the Project footprint and includes additional construction areas to allow for the shifting of project components, known as micro-siting, based on a final approved project design. See Figure 2 for a map of the MPE and applicable county zoning at the Project Site Control Boundary. Only the MPE is subject to the vegetation management activities and best management practices described in this Vegetation Management Plan as the construction and operation of the Project will only occur within the bounds of the MPE.

The Project is a proposed solar photovoltaic (PV) electric generating facility with a capacity of 160 megawatts (MW) of alternating current (AC) solar energy and 63 MW of battery energy storage, as well as associated interconnection and ancillary support infrastructure. The Project will use solar modules configured in a solar array to convert energy from the sun into electric power: solar arrays comprised of single axis tracking PV modules, pile driven racking equipment, cabling, power inverters and transformers mounted on concrete pads, and an electrical collection system of overhead and underground cables. Other Project components include a battery energy storage system (BESS), a Project substation, interconnection equipment, operations and maintenance (O&M) building and employee parking, laydown area, access roads, and perimeter fencing. Fencing will be installed around the perimeter of the solar arrays, the Project substation, and BESS. The Project will interconnect to the Northwest transmission grid via Bonneville Power Administration's (BPA) existing Knight Substation located adjacent to the Project substation.

The Project will use existing roads to the extent practicable but will also construct new Project access roads within the MPE. An overhead collector line will be sited within the existing Klickitat County Knight Road ROW and access roads and collection lines will be sited within a portion of the existing BPA transmission line ROW associated with the existing North Bonneville-Midway No. 1 and Wautoma-Ostrander No. 1 transmission lines. The operational period of the Project is anticipated to be approximately 25 to 40 years.

2.0 Purpose of this Plan

The Vegetation Management Plan has been prepared to avoid, minimize or mitigate impacts to vegetation resources in the MPE anticipated to result from construction and operation of the Project. The Plan addresses vegetation management activities and best management practices related to the Project's construction and operation and specifies methods that will be implemented for effective revegetation of temporarily disturbed areas and noxious weed control.

3.0 Existing Project Conditions

Existing land uses in the Project Study Area predominately include crop cultivation (mostly dryland wheat) and pasturelands with some undeveloped areas, local roads, and electrical infrastructure (e.g., transmission and distribution lines). Adjacent land uses surrounding the Project Study Area are similar and also include scattered rural residences, the Goldendale Fish Hatchery and adjacent Washington Department of Fish and Wildlife (WDFW) lands, Washington Department of Natural Resources lands, rangelands, SR 142, and the BPA Knight Substation.

The topography within the Project Study Area is relatively flat with gentle rolling hills. Vegetation within the majority of the Project Study Area has been modified due to historic and current agriculture and grazing activity. Native vegetation communities have been replaced by cultivated croplands and non-native invasive grasses and forbs are prevalent throughout the Project Study Area due to historic and current farming and grazing activity.

Eighteen soil map units are mapped in the Project Study Area. Silt loam soils were the primary underlying soil type accounting for approximately 1,665 acres (83 percent) of the soil types within the Project Study Area. The dominant soil mapped within the Project Study Area is the Goldendale silt loam, basalt substratum, 2 to 5 percent slopes which comprises approximately 767 acres (38 percent) of the Project Study Area.

3.1 Existing Habitat Types

Six habitat types were mapped within the Project Study Area (Figure 3, Tetra Tech 2022a). The majority (approximately 97 percent) of the Project Study Area consisted of two habitat types: agriculture, pastures, and mixed environs and dwarf shrub-steppe. The other four habitat types composed the remaining approximately 3 percent of the Project Study Area.

Agriculture, pastures, and mixed environs comprises 1,727 acres (86 percent of the Project study Area. This habitat type includes the following subtypes: cultivated croplands (38 percent of the Project Study Area), improved pastures (25 percent of the Project Study Area), as well as unimproved pasture (15 percent of the Project Study Area), and modified grasslands (9 percent of the Project Study Area). Cultivated croplands consisted predominantly of wheat fields that are typically grown on a two-year wheat-fallow cycle. Per Johnson and O'Neil (2001), improved pastures are used to produce perennial herbaceous plants for grass seed and hay. Improved pastures within the Project Study Area primarily consisted of fields planted with alfalfa (*Medicago sativa*) or grasses, such as smooth brome (*Bromus inermis*), for the production of hay. Unimproved pastures, following Johnson and O'Neil (2001), includes abandoned fields that have little or no active management and may or may not be grazed by livestock. Unimproved pastures within the Project Study Area included abandoned fields and areas planted with non-native grasses. Typically, these unimproved pastures were being grazed by cattle. Per Johnson and O'Neil (2001), modified grasslands typically consist of overgrazed habitats that are "*dominated by non-native annual plants with only remnant individual plants of the native vegetation.*" Modified grasslands within the Project Study Area were dominated by non-native grasses.

The dwarf shrub-steppe habitat is considered a Priority Habitat by the WDFW (WDFW 2008) and is located outside areas that have been historically plowed in the Project Study Area. This habitat type typically occurs on sites with little soil development that often have extensive areas of exposed rock, gravel, or compacted soil (Johnson and O'Neil 2001, Rocchio and Crawford 2015). Vegetation cover within this habitat type typically consisted of native dwarf shrubs and subshrubs,

3.2 Noxious Weeds

The Washington State Noxious Weed Control Board (WSNWCB) advises the Washington State Department of Agriculture about noxious weed control in Washington state. Through its actions and policy decisions, the WSNWCB helps coordinate and support the activities of the various regional noxious weed control boards and weed districts of Washington. The WSNWCB also maintains the state's official list of noxious weeds (as established in Washington Administrative Code [WAC] 16-750), which landowners are required to control.

Chapter 17.10 of the RCW mandates the establishment of county noxious weed control boards. In Klickitat County, per Chapter 17.10 RCW, the Klickitat County Noxious Weed Control Board acts as the local governing body administering Washington's noxious weed law.

Based on the background review conducted for the Project's Botanical Survey Report (see Attachment F of the ASC), 155 species are currently designated as noxious weeds in Washington State, including 38 Class A Weeds, 66 Class B Weeds, and 51 Class C Weeds (WSNWCB 2021). In Klickitat County, 127 species are currently designated as noxious weeds, including 38 Class A Weeds, 41 Class B Designate Weeds, 25 Class B Non-Designate Weeds, and 23 Class C Weeds (KCNWCB 2021). See Appendix A for the current Klickitat County Noxious Weed List.

Per the WSNWCB (WSNWCB 2021), the following are the definitions for each class of noxious weed:

- Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.
- Class B Weeds: Non-native species presently limited to portions of the state. Species are designated for required control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal.
- Class C Weeds: Noxious weeds that are typically widespread in Washington or are of special interest to the state's agricultural industry. The Class C status allows county weed boards to require control if locally desired, or they may choose to provide education or technical consultation.

Tetra Tech observed 12 state- and/or county-listed noxious weed species during 2022 field surveys (Tetra Tech 2022b). Table 1 lists the noxious weed species observed (scientific and common name), their noxious weed designation, the frequency of observations within the Project Study Area, and sizes of infestations. Figure 4 shows the locations of noxious weeds observed during field surveys. No Class A Weeds were observed, however several Class B and C Weeds were documented.

Table 1. Noxious Weeds Observed within the Project Study Area

Common Name	Scientific Name	State Status/County Status[1]	Frequency of Observations	Infestation Size[2]
Bull thistle	*Cirsium vulgare*	Class C / Not listed	Observed in three locations in Project Study Area.	Two small (<0.1 acre) and one medium-sized infestation observed.
Canada thistle	*Cirsium arvense*	Class C / Class C	Commonly observed in Project Study Area.	Infestations typically consisted of small, moderately dense infestations and medium-sized, moderately dense infestations.
Cereal rye	*Secale cereale*	Class C / Not listed	Commonly observed in Project Study Area.	Infestations ranged in size from small to large.
Evergreen blackberry	*Rubus laciniatus*	Class C / Not listed	Observed in one location in Project Study Area.	Observation consisted of a small, moderately dense infestation.
Field bindweed	*Convolvulus arvensis*	Class C / Not listed	Abundant throughout Project Study Area.	Infestations ranged from small to large patches consisting of sparse, scattered individuals to areas with high cover of field bindweed.
Jointed goat grass	*Aegilops cylindrica*	Class C / Class C	Observed in six locations in the Project Study Area.	Most infestations were small; however, two infestations were medium-sized.
Medusahead	*Taeniatherum caput-medusae*	Class C / Not listed	Abundant throughout much of the Project Study Area.	Most infestations were larger than 1 acre and consisted of high cover of medusahead.

Common Name	Scientific Name	State Status/County Status[1]	Frequency of Observations	Infestation Size[2]
Reed canarygrass	*Phalaris arundinacea*	Class C / Not listed	Observed in several locations in Project Study Area.	Observation typically consisted of a medium to large-sized, dense infestations.
Rush skeletonweed	*Chondrilla juncea*	Class B / Class B	Commonly observed in Project Study Area.	Infestations typically consisted of small, moderately dense infestations; however, several medium-sized, dense infestations were also observed.
Sulphur cinquefoil	*Potentilla recta*	Class B / Class B	Observed in three locations in Project Study Area.	Infestations ranged in size from small, sparse infestations to large, dense infestations.
Ventenata	*Ventenata dubia*	Class C / Not listed	Abundant throughout the Project Study Area.	Most infestations were larger than 1 acre and consisted of high cover of ventenata.
Yellow toadflax	*Linaria vulgaris*	Class C / Not listed	Observed in one location in the southwestern portion of Project Study Area.	Infestation was less than 1 acre in size and moderately dens.

[1] Class B "Designate" weeds are those designated for control in Klickitat County.
[2] Infestation size: small = less than 0.1 acre; medium = 0.1 to 1 acre; large = greater than 1 acre.

Three noxious weed species were abundant throughout the Project Study Area: field bindweed (*Convolvulus arvensis*), medusahead (*Taeniatherum caput-medusae*), and ventenata (Figure 4). Field bindweed and medusahead were observed throughout all but the northern portion of the Project Study Area and ventenata was documented throughout the Project Study Area. Infestations of these three species were typically medium-sized (0.1 to 1 acre) or large (1 to 5 acres) and consisted of moderately dense to dense cover of individuals in the areas where observed.

Four species were commonly observed within the Project Study Area: Canada thistle (*Cirsium arvense*), cereal rye (*Secale cereale*), reed canarygrass (*Phalaris arundinacea*), and rush skeletonweed (*Chondrilla juncea*). Canada thistle was commonly observed along streams in the central and southern portions of the Project Study Area. Small (less than 0.1 acre) to large (1-5 acres) of cereal rye were observed in various locations throughout the Project Study Area. Infestations consisted of sparse, scattered individuals to areas with high cover of cereal rye. Reed canarygrass was commonly observed along streams and wetlands in the southern portion of the Project Study Area. Most infestations were medium or large in size and consisted of dense cover of reed canarygrass. Rush skeletonweed was observed in scattered locations throughout the Project Study Area, but was most abundant in the central portion. Infestations ranged from sparse, scattered individuals to areas with high cover of rush skeletonweed.

The remaining five noxious weeds—bull thistle (*Cirsium vulgare*), evergreen blackberry (*Rubus laciniatus*), jointed goatgrass (*Aegilops cylindrica*), sulphur cinquefoil (*Potentilla recta*), and yellow toadflax (*Linaria vulgaris*)—were observed in 1 to 6 locations in the Project Study Area. Bull thistle

was observed in three locations in the central and southern portions of the Project Study Area. All observations were along or near streams. One small (less than 0.1 acre) observation of evergreen blackberry was documented in the southwestern portion of the Project Study Area. Jointed goatgrass was observed in six locations in the central and southern portions of the Project Study Area. Most infestations were adjacent to roads or agricultural fields. Sulphur cinquefoil was observed in three locations, two in the southern and one in the northern portion of the Project Study Area. The observation in the northern portion was small (less than 0.1 acre) and consisted of sparse individuals; whereas the two observations in the south consisted of larger (greater than 1 acres), moderately dense infestations. Yellow toadflax was observed in one location in the southwestern portion of the Project Study Area. This infestation was medium-sized (0.1 to 1 acre) and moderately dense.

4.0 Vegetation Management

4.1 Construction

Actions will be taken to minimize impacts during construction including implementing BMPs and erosion control measures. Noxious weed species will be controlled as described in Section 5.0 Noxious Weed Management.

Grading will be restricted to access roads (as needed), concrete pads, and facility footprints within the MPE. Vegetation clearing, where required within or between agricultural lands, will occur in construction areas, areas that are graded, and access roads. Vegetation clearing will be minimized to the extent feasible to minimize surface disturbance and maintain existing native vegetation communities such as dwarf shrub steppe. Erosion control measures will be implemented to avoid, minimize, or mitigate effects from surface-disturbing activities as required by the Construction General Permit and within the approved Stormwater Pollution Prevention Plan and Erosion and Sediment Control Plan. Once surface disturbance activities have been completed, permanent stabilization measures will be initiated.

To the extent feasible, construction will maintain existing topography, natural drainage patterns and infiltration across the MPE. To restore the temporarily disturbed areas as a result of construction activities, reclamation measures will be implemented. Disturbed areas will be revegetated at the conclusion of construction activities with low-growing native species and/or a mix of native and desirable non-native, non-invasive species (i.e., species that would provide more rapid soil stabilization and vegetative cover than slower growing native species), to be identified in coordination with WDFW and other local and state agencies as applicable. Timing of reseeding will be dependent on the seed mix, site conditions, and weather. Additional reclamation measures will be determined at the end of construction and will be dependent on-site conditions.

4.2 Operations and Management

Vegetation management during O&M is expected to be minimal and will predominantly consist of vegetation control and maintenance within the MPE (e.g., mowing, clearing around structures and fence lines, weed control, etc.). that will be conducted in areas of permanent disturbance including but not limited to the access roads, concrete pads for inverters and transformers, and facility foundations. Vegetation control and maintenance will be determined by the weather, season, and site conditions and will seek to eliminate shading of the panels, vegetation touching the panels, maintain internal access for O&M, and emergency response, limit fire risk around transformers, inverters, and collectors, and promote low growing native vegetation communities as feasible. O&M staff will routinely monitor the vegetation on site and determine the clearing schedule, noxious weed management timing, and vegetation restoration success.

To additionally minimize fire risks, the following BMPs will be implemented:

- Above ground electrical wires will run under the solar panels at the midpoint or higher than the center of the panel, and
- Gravel will be placed around the concrete pads under the inverters and transformers.
- A 20-foot fire break will be maintained between the fence line and the closest solar array.

BMPs will be implemented during construction and operations, including but not limited to the use of spark arrestors on power equipment, vehicles and equipment with fire extinguishers and shovels, an approved Fire Control Plan in place, and allowing smoking in designated areas only. Specific fire-related BMPs will be outlined in the Fire Control Plan, which will be made available to the Klickitat County Department of Emergency Management and Fire Protection District 7.

Noxious weed species will be controlled during Project operations as described in Section 5.0 Noxious Weed Management.

5.0 Noxious Weed Management

Twelve noxious weeds were documented during 2022 field surveys, many of which were common or abundant within the Project Study Area (Tetra Tech 2022b). Only the Rush skeletonweed and the Sulphur cinquefoil are listed as Class B weeds in Klickitat County and the Canada thistle as a Class C weed in the Klickitat County Noxious Weed List (Appendix A). The other 9 documented noxious weeds are listed as Class C weeds by the state (Table 1). As noted in Section 3.2, Class B weeds are widespread in some parts of the state, but rare or absent in other parts. The goal with these weeds is to control their spread and reduce their population where found. Class C weeds are those that are common and widespread; these weeds are not required to be controlled, unless the County Weed Control Board believes they are a threat to agriculture or natural resources (which none of the Class C weeds documented have been designed as such by the county).

The Project will comply with RCW 17.10.140 related to the landowner's duty to control the spread of noxious weeds. All Class A weeds found at the Project MPE before or during construction and

during operation will be eradicated. Additionally, Class B weeds found at the Project MPE will be controlled and, where feasible, eradicated depending on the existing abundance of the weed on site.

Class C weeds will be controlled within the MPE, and the Project will work with the Klickitat County Noxious Weed Control Board to develop a plan for mitigating the risk of spreading those weeds.

An integrated approach to noxious weed management is critically important to the effective control of noxious weeds (Dewey et al. 2006). CCR will use an integrated noxious weed management strategy, using a combination of preventative, mechanical, and chemical controls throughout all phases of Project implementation, as applicable. Focus will be preventing the spread of noxious weeds as this is the most effective measure in controlling weed infestations (Dewey et al. 2006). Appropriate species- and site-specific treatments will be implemented in accordance with the with the Klickitat County Weed Control Board, the Washington Department of Agriculture, the Washington Department of Ecology requirements, and landowner agreements.

The following measures will be implemented during construction to minimize the spread and establishment of noxious weeds:

- Project construction personnel will undergo training on the identification of common noxious weeds in the region, weed management measures, and the importance of prevention prior to beginning work on the Project.
- All equipment and vehicles will be washed prior to entering the construction site or solar facility.
- Noxious weed locations will be marked prior to the start of site clearing activities.
- Cleared vegetation will not be placed or stored within known noxious weed locations.
- Stabilization and/or reclamation of disturbed ground will be implemented immediately after construction, or as soon as practicable during construction.
- Chemical or mechanical weed control measures may be implemented prior to construction, during construction, following surface disturbance, or during operation based on the noxious weed species and its associated growth habit and phenology.
- Appropriate species- and site-specific treatments will be implemented in accordance with Washington Department of Agriculture and Klickitat County Weed Control Board requirements and recommendations and landowner agreements.

Monitoring of noxious weeds will also be conducted as part of ongoing operation inspections. Operations personnel will be trained in noxious weed identification and will document observations of noxious weeds during normal operations and maintenance inspections. Monitoring will be conducted at least annually. Identified noxious weed populations will be treated consistently with those measures applied post-construction.

5.1 Preventative Weed Controls

Preventative weed controls refer to any technique that involves maintaining field conditions such that noxious weeds are less likely to become established or spread. Preventative controls include soil stabilization, maintaining good soil fertility, selection of seed mixes appropriate for various site conditions (including selection of well-adapted competitive species), over-seeding of desirable species, avoiding over-grazing to the extent practicable (if limited animal grazing occurs as part of ongoing vegetation management), and quarantines for identified noxious weed locations (Oregon State University 2020).

The Project will minimize soil disturbance during construction and will replant disturbed areas with low-growing native seed mixes and/or a mix of native and desirable non-native, non-invasive species (i.e., species that would provide more rapid soil stabilization and vegetative cover than slower growing native species). Prior to construction, a survey of the existing conditions will be conducted to identify existing noxious weeds. These weeds will be removed and/or controlled during site preparation and throughout the construction process using mechanical control as a primary method for management. Herbicide use may be used as an optional method of control in combination with other practices for the management of weeds.

5.2 Mechanical Weed Controls

Mechanical weed controls refer to physical measures to remove noxious weeds, including mowing, chopping, hoeing, use of weed eaters, discing, and livestock grazing. These are effective as short-term measures for controlling noxious weeds and are especially effective when used repeatedly and in concert with other measures (Dewey et al. 2006). Implementing mechanical controls early in the growing season may prevent certain species from going to seed and spreading (Connett et al. 2017). Areas treated with mechanical controls may be subsequently treated with herbicide to ensure the species does not recolonize before native species can become established.

Once the Project is operational, mechanical control (i.e., mowing) may be conducted on a monthly and/or bi-monthly basis, depending on the season and as needed, over the entire lifespan of the Project. CCR is also exploring the potential for dual-agricultural use at the Project site which may include limited animal grazing which could assist the ongoing vegetation management.

The Project will retain a qualified landscaping contractor to provide regular weed control and eliminate the spread of new noxious weed presence resultant from construction and operations activity at the Project site.

5.3 Chemical Weed Controls

Chemical weed controls refer to herbicide application. There are many types of herbicides and no one herbicide treatment is effective for all weed species. Selection of the appropriate chemical treatment methods must take the species' life cycle and timing of treatment into account. In general, herbicide treatments tailored for specific species are most effective for controlling noxious weeds, especially when integrated with other weed control methods (Dewey et al. 2006). CCR will

select herbicides and treatment strategies that will be most effective against noxious weeds and least detrimental to desirable species and the environment. The herbicides used will follow recommendations and guidance from the U.S. Environmental Protection Agency (USEPA), Washington State Department of Agriculture, and the Klickitat County Weed Board.

The following BMPs will be implemented, as applicable, for herbicide use as a secondary method of control and management of weeds, and in combination with mechanical controls where necessary and appropriate.

- Herbicide application will be conducted by a certified pesticide applicator.
- Herbicide application will not occur during precipitation or when a precipitation event is forecasted within 24 hours.
- The use of herbicides will be prohibited within 200 feet of the mapped populations of state threatened foxtail mousetail (*Myosurus alopecuroides*). Although the mapped populations are located outside the Project MPE, the vernal pools associated with this species and the required buffer of 200 feet will be flagged/fenced prior to construction.
- No herbicide spraying will occur when winds are greater than 15 miles an hour.
- CCR will consider impacts of herbicide application on sensitive areas, such as those containing suitable habitat for special status species, wetlands, and waterbodies, and may elect to use mechanical control methods in these areas to provide additional short-term weed control and limit the establishment of noxious weed populations.
- The Project will comply with the maximum stream and wetland setbacks and buffers required by both the State and County Critical Areas Ordinance (CAO) external to and within the proposed MPE permitted area (i.e., fenced solar panel arrays).
- Additionally, impacts to wetlands and streams from soil erosion, sediment transport, and other potential pollutants will be precluded by the installation and maintenance of stormwater controls and best management practices (BMPs) within the MPE to be in compliance with the requirements of the Stormwater Management Manual for Eastern Washington[1] and the Construction Stormwater General Permit[2]. Requirements to monitor and conduct water quality testing for turbidity, fine sediment, high pH, or phosphorus will be implemented as part of the regulatory requirements.

6.0 References

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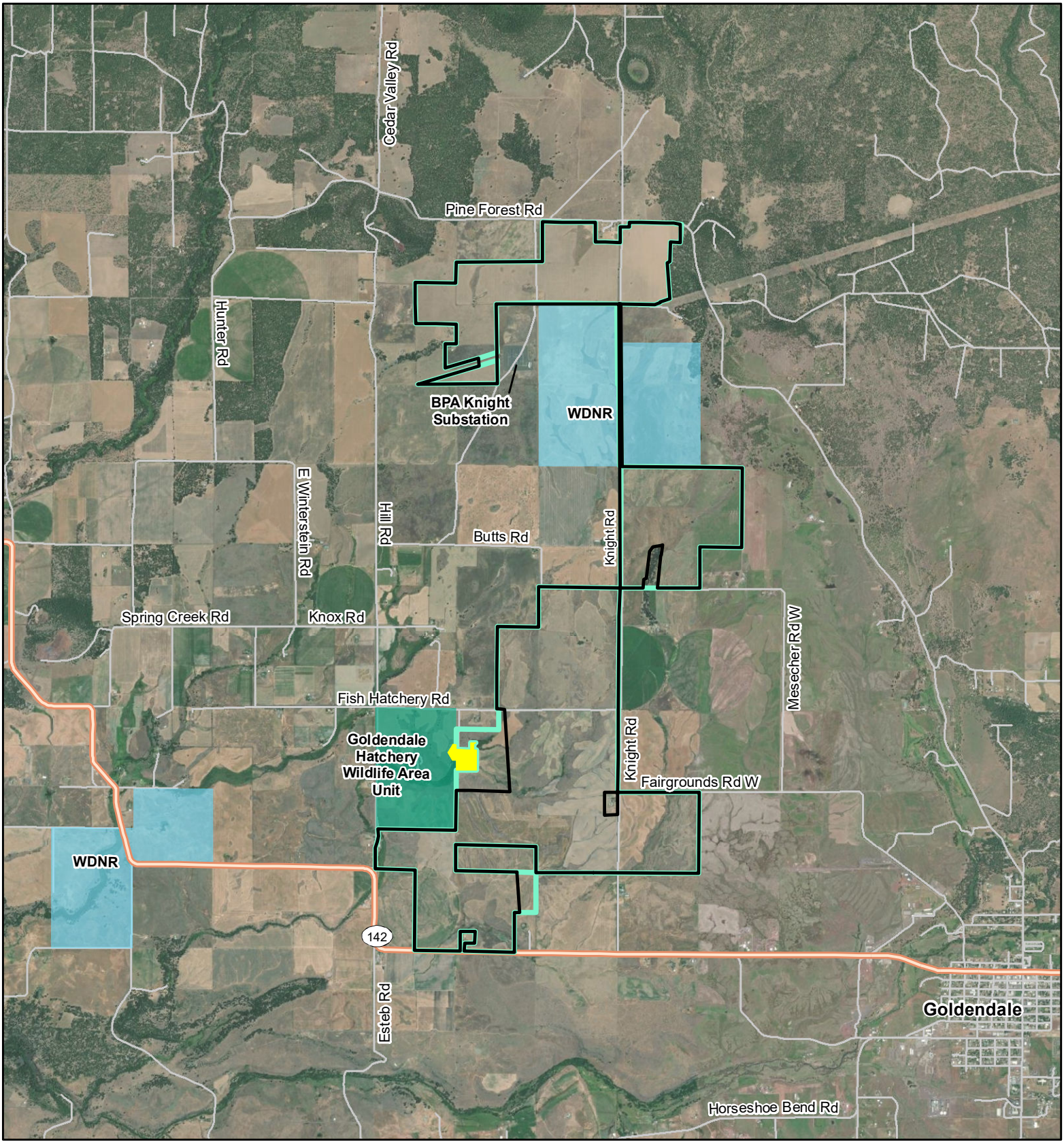
Figures



Project Site Control Boundary
Project Study Area
Public and Protected Lands
Washington Dept. of Fish and Wildlife
Washington Dept. of Natural Resources
Goldendale Fish Hatchery
State Route
Local Road

N

0 0.5 1
Miles

TETRA TECH

Figure 1
Project Location

Prepared for:
Carriger Solar, LLC Project
February 9, 2023

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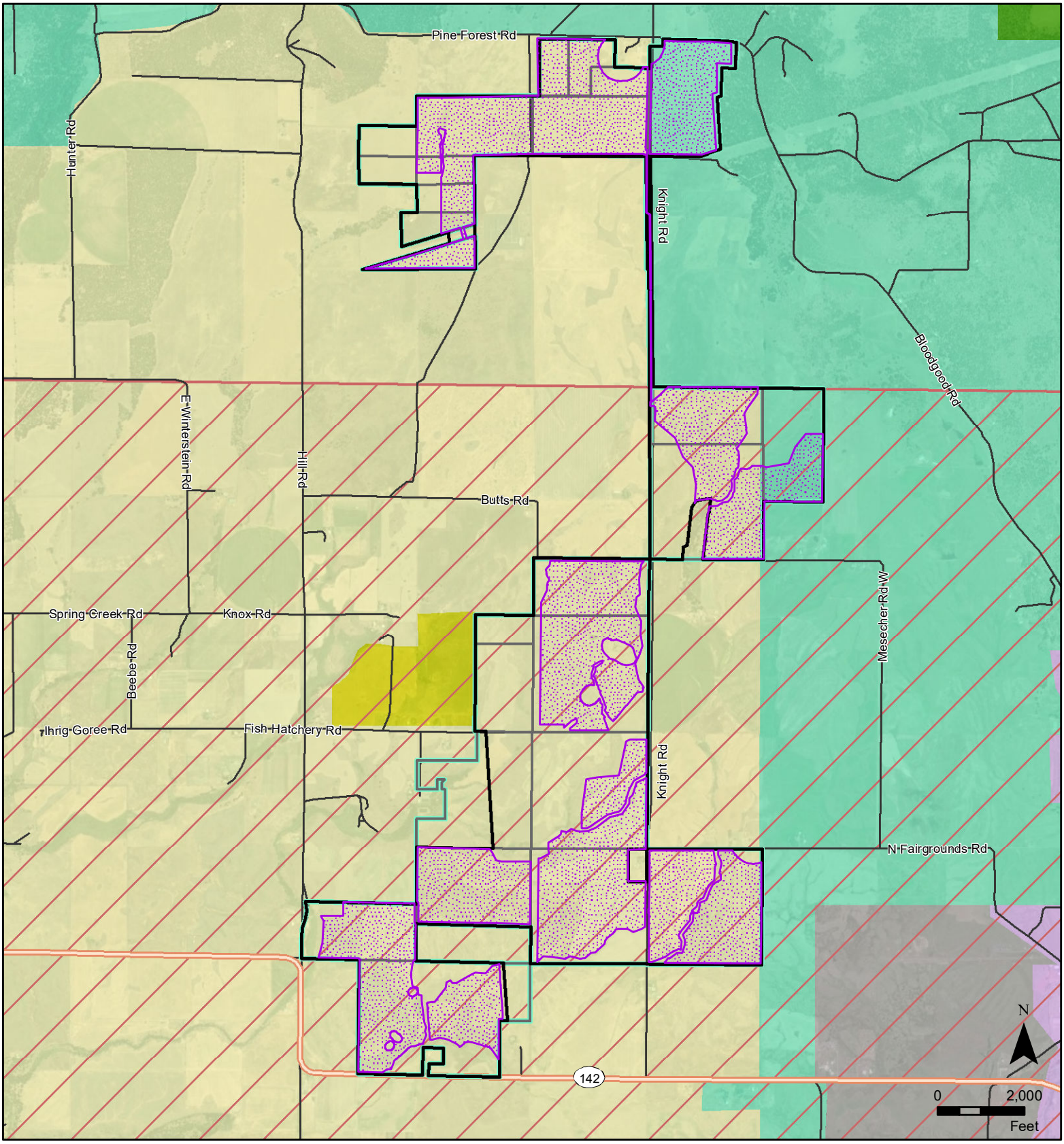

Project Site Control Boundary
Project Study Area
Maximum Project Extent
Project Parcels
Energy Overlay Zone (EOZ)

Zoning

Extensive Agriculture
Extensive Agriculture-Cluster
Forest Resource
General Rural
Industrial Park
Open Space
Rural Residential 2

TETRA TECH

Figure 2
Zoning and EOZ

Prepared for:
Carriger Solar, LLC Project
February 9, 2023

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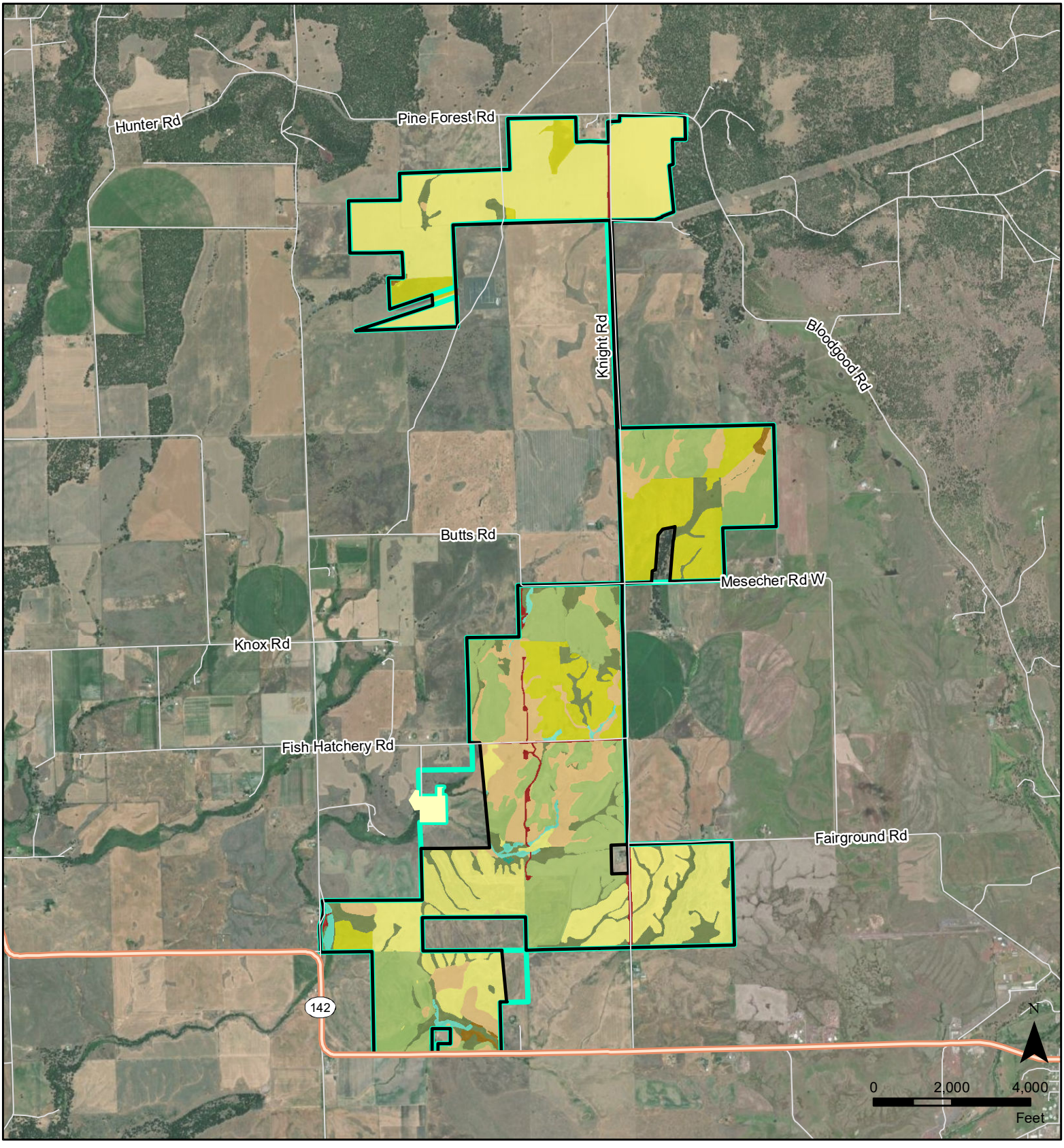

- Project Site Control Boundary
- Project Study Area
- Goldendale Fish Hatchery
- State Route
- Local Road

Field-delineated Vegetation Communities

- Agriculture
- Dwarf Shrub-steppe
- Eastside (Interior) Grasslands
- Eastside (Interior) Riparian-Wetlands
- Improved Pasture
- Modified Grasslands
- Ponderosa Pine Forest and Woodlands (includes Eastside Oak)
- Unimproved Pasture
- Urban and Mixed Environs

TETRA TECH

Figure 3
Habitat Types within the Project Study Area

Prepared for:
Carriger Solar, LLC Project
February 9, 2023

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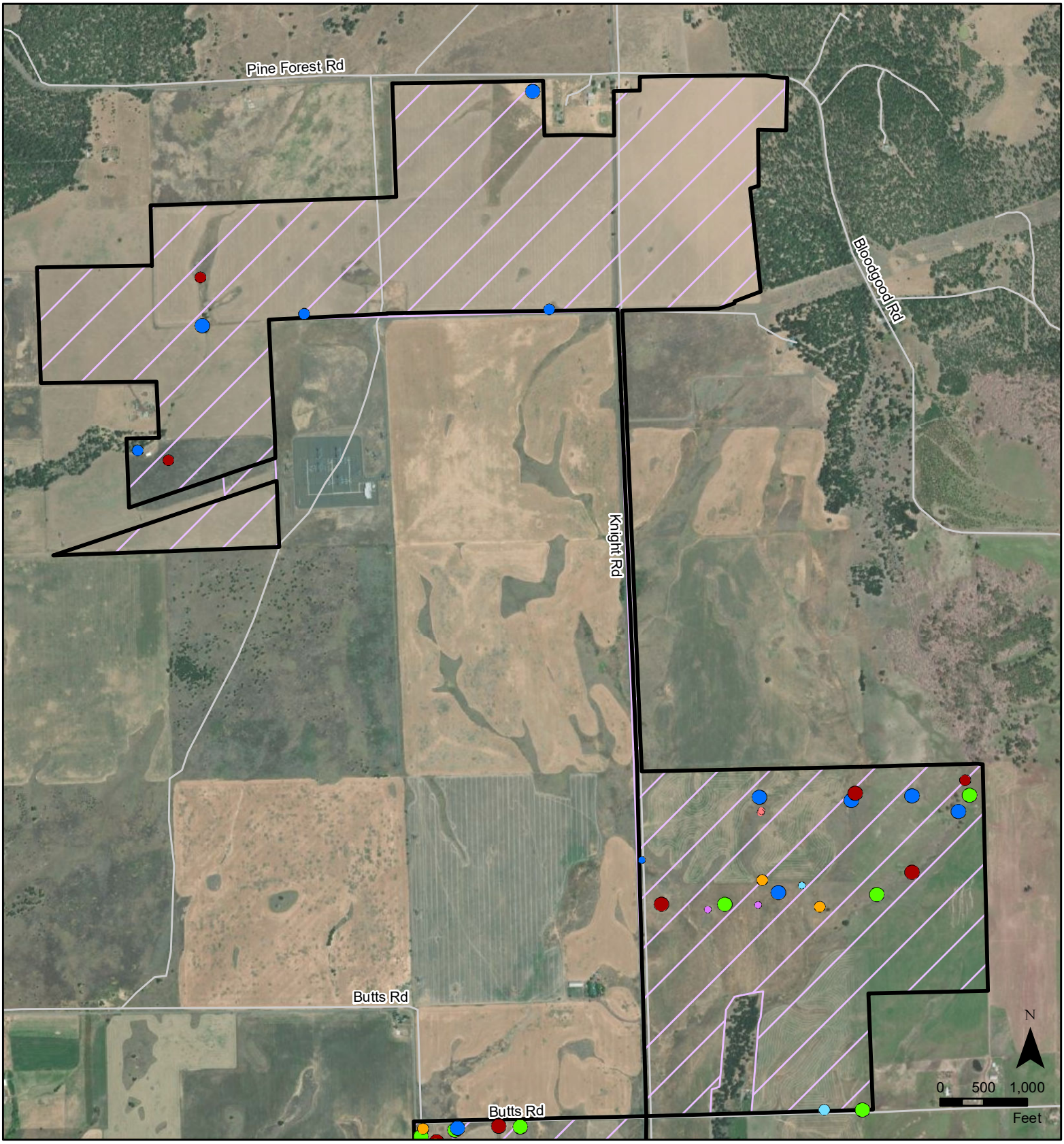

Project Lease Boundary
Project Survey Area
Goldendale Fish Hatchery
State Route
Local Road

Noxious Weed
Bull thistle *(Cirsium vulgare)*
Canada thistle *(Cirsium arvense)*
Cereal rye *(Secale cereale)*
Evergreen blackberry *(Rubus laciniatus)*
Field bindweed *(Convolvulus arvensis)*
Jointed goatgrass *(Aegilops cylindrica)*
Medusahead *(Taeniatherum caput-medusae)*
Reed canarygrass *(Phalaris arundinacea)*
Rush skeletonweed *(Chondrilla juncea)*
Sulphur cinquefoil *(Potentilla recta)*
Ventenata *(Ventenata dubia)*
Yellow toadflax *(Linaria vulgaris)*

Size of Infestation
< 0.1 acre
0.1-1 acre
1-5 acres

Figure 4
Noxious Weeds Observed within the Project Survey Area

Carriger Solar, LLC Project
Klickitat County, WA

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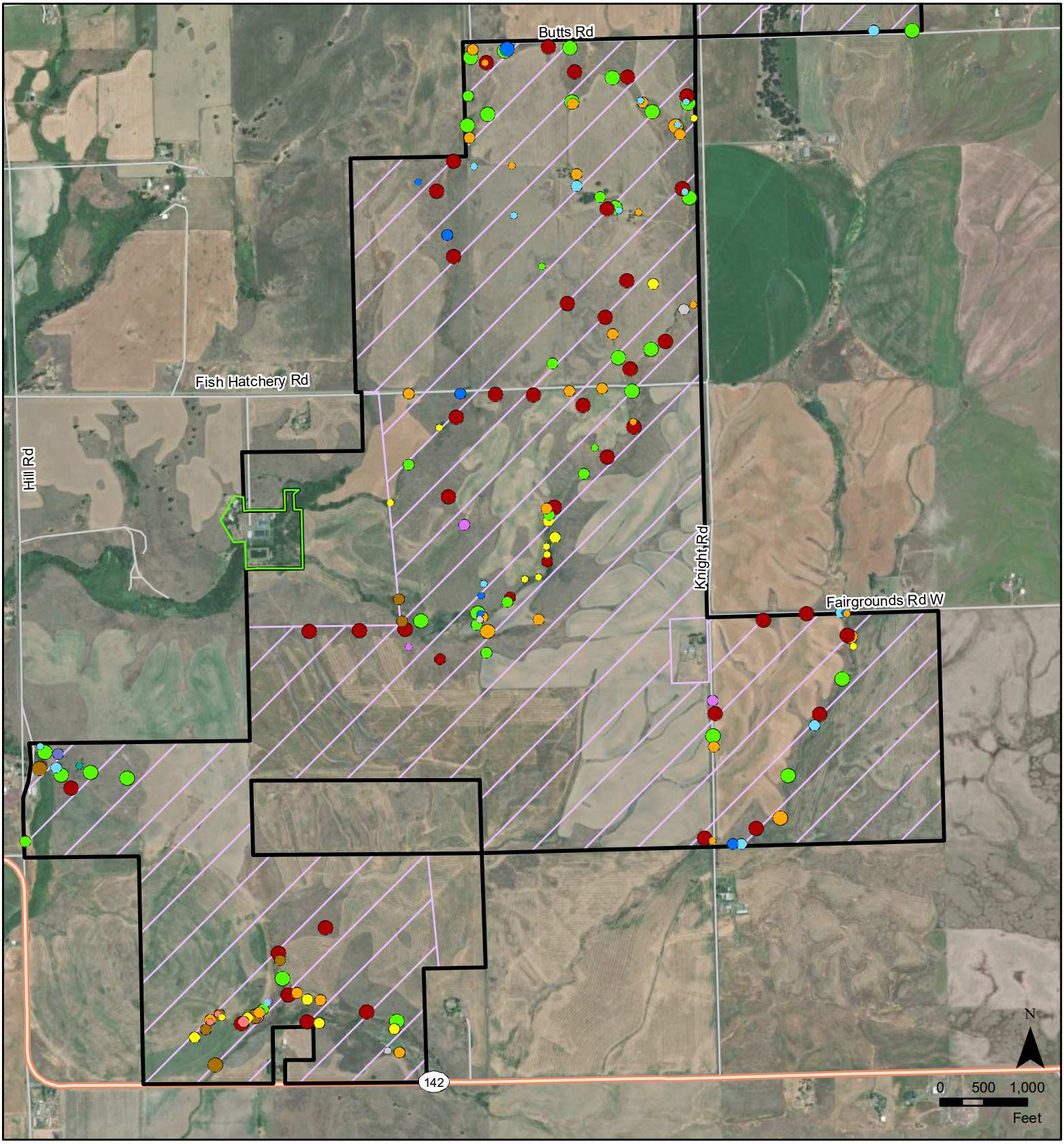

Project Lease Boundary
Project Survey Area
Goldendale Fish Hatchery
State Route
Local Road

Noxious Weed
- Bull thistle *(Cirsium vulgare)*
- Canada thistle *(Cirsium arvense)*
- Cereal rye *(Secale cereale)*
- Evergreen blackberry *(Rubus laciniatus)*
- Field bindweed *(Convolvulus arvensis)*
- Jointed goatgrass *(Aegilops cylindrica)*
- Medusahead *(Taeniatherum caput-medusae)*
- Reed canarygrass *(Phalaris arundinacea)*
- Rush skeletonweed *(Chondrilla juncea)*
- Sulphur cinquefoil *(Potentilla recta)*
- Ventenata *(Ventenata dubia)*
- Yellow toadflax *(Linaria vulgaris)*

Size of Infestation
- < 0.1 acre
- 0.1-1 acre
- 1-5 acres

Figure 4
Noxious Weeds Observed within the Project Survey Area

Carriger Solar, LLC Project
Klickitat County, WA

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Appendix A.

2016 KLICKITAT COUNTY

NOXIOUS WEED LIST

Links in the tables below are to the

Washington State Noxious Weed Control Board web site.

Class A Weeds

CLICK ABOVE LINK FOR PICTURES OF CLASS A WEEDS.

The State of Washington through RCW 17.10 has listed the following Class A weeds for eradication statewide. Class A consists of those noxious weeds not native to state that are of limited distribution or are unrecorded in the state and that pose a serious threat to the state. (RCW 17.10.010.2.(a))

Common Name:	***Scientific Name***
broom, French	*Genista monspessulana*
broom, Spanish	*Spartium junceum*
common crupina	*Crupina vulgaris*
cordgrass, common	*Spartina anglica*
cordgrass, dense flower	*Spartina densiflora*
cordgrass, salt meadow	*Spartina patens*
cordgrass, smooth	*Spartina alterniflora*
dyers woad	*Isatis tinctoria*
eggleaf spurge *	*Euphorbia oblongata*
false brome	*Brachypodium sylvaticum*
floating primrose-willow	*Ludwigia peploides*
flowering rush	*Butomus umbellatus*
garlic mustard	*Alliaria petiolata*
giant hogweed *	*Heracleum mantegazzianum*
goatsrue	*Galega officinalis*
hydrilla	*Hydrilla verticillata*
johnsongrass *	*Sorghum halepense*
knapweed, bighead *	*Centaurea macrocephala*
knapweed, Vochin *	*Centaurea nigrescens*
kudzu	*Pueraria montana var. lobata*
meadow clary	*Salvia pratensis*
oriental clematis	*Clematis orientalis*
purple starthistle	*Centaurea calcitrapa*
Ravenna grass	*Saccharum ravennae*
reed sweetgrass	*Glyceria maxima*
ricefield bulrush	*Schoenoplectus mucronatus*
sage, clary	*Salvia sclarea*
sage, Mediterranean *	*Salvia aethiopis*
silverleaf nightshade	*Solanum elaeagnifolium*
spurge flax	*Thymelaea passerina*

Syrian bean-caper	*Zygophyllum fabago*
Texas blueweed	*Helianthus ciliaris*
thistle, Italian	*Carduus pycnocephalus*
thistle, milk	*Silybum marianum*
thistle, slenderflower	*Carduus tenuiflorus*
variable-leaf milfoil	*Myriophyllum heterophyllum*
wild four o'clock	*Mirabilis nyctaginea*

Class B-Designate Weeds

CLICK ABOVE LINK FOR PICTURES OF CLASS B WEEDS.

The State of Washington through RCW 17.10 has listed the following Class B weeds as designated for control in Klickitat County. Class B consists of those noxious weeds not native to the state that are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region. (RCW 17.10.010.2(b))

Common Name	***Scientific Name***
blueweed	*Echium vulgare*
Brazilian elodea	*Egeria densa*
bugloss, annual	*Anchusa arvensis*
bugloss, common	*Anchusa officinalis*
camelthorn	*Alhagi maurorum*
common fennel	*Foeniculum vulgare*
common reed, nonnative	*Phragmites australis*
fanwort	*Cabomba caroliniana*
gorse	*Ulex europaeus*
grass-leaved arrowhead	*Sagittaria graminea*
hawkweed oxtongue	*Picris hieracioides*
hawkweed, orange	*Hieracium aurantiacum*
herb-Robert *	*Geranium robertianum*
knapweed, black	*Centaurea nigra*
knapweed, brown	*Centaurea jacea*
knotweed, Bohemian *	*Polygonuym x bohemicum*
knotweed, giant *	*Polygonum sachalinense*
knotweed, Himalayan	*Polygonum polystachyum*
knotweed, Japanese *	*Polygonum cuspidatum*
loosestrife, garden	*Lysimachia vulgaris*
loosestrife, purple *	*Lythrum salicaria*
loosestrife, wand	*Lythrum virgatum*
Nonnative hawkweed species and hybrids of WALL subgenus	*Hieracium subgenus, Hieracium*
parrotfeather	*Myriophyllum aquaticum*
policeman's helmet	*Impatiens glandulifera*
saltcedar * (unless intentionally planted prior to 2004)	*Tamarix ramosissima*
Shiny geranium	*Geranium lucidum*

spurge laurel	*Daphne laureola*
spurge, leafy *	*Euphorbia esula*
spurge, myrtle *	*Euphorbia myrsinites L*
thistle, musk	*Carduus nutans*
thistle, plumeless	*Carduus acanthoides*
thistle, Scotch *	*Onopordum acanthium*
velvetleaf	*Abutilon theophrasti*
water primrose	*Ludwigia hexapetala*
white bryony	*Bryonia alba*
wild chervil	*Anthriscus sylvestris*
yellow archangel *	*Lamiastrum galeobdolon*
yellow floating heart	*Nymphoides peltata*

Class B Weeds

CLICK ABOVE LINK FOR PICTURES OF CLASS B WEEDS.

The Klickitat County Noxious Weed Control Board through RCW 17.10 has listed the following Class B weeds, not designated by the State, to be on the county noxious weed list. Class B consists of those noxious weeds not native to the state that are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region. (RCW 17.10.010.2(b))

Common Name	***Scientific Name***
butterfly bush *	*Buddleia davidii*
Dalmatian toadflax *	*Linaria dalmatica ssp. dalmatica*
Eurasian watermilfoil *	*Myriophyllum spicatum*
hairy willow-herb *	*Epilobium hirsutum*
hoary alyssum *	*Berteroa incana*
houndstongue *	*Cynoglossum officinale*
indigobush *	*Amorpha fruticosa*
knapweed, diffuse *	*Centaurea diffusa*
knapweed, meadow *	*Centaurea x moncktonii*
knapweed, Russian *	*Acroptilon repens*
knapweed, spotted *	*Centaurea stoebe*
kochia *	*Kochia scoparia*
lesser celandine	*Ficaria verna*
Nonnative hawkweed species and hybrids of MEADOW subgenus	*Hieracium subgenus, Pilosella*
perennial pepperweed *	*Lepidium latifolium*
poison hemlock *	*Conium maculatum*
puncturevine *	*Tribulus terrestris*
rush skeletonweed *	*Chondrilla juncea*
Scotch broom *	*Cytisus scoparius*
sulfur cinquefoil *	*Potentilla recta*
tansy ragwort *	*Senecio jacobaea*
yellow nutsedge*	*Cyperus esculentus*
yellow starthistle *	*Centaurea solstitialis*

Class C Weeds

CLICK ABOVE LINK FOR PICTURES OF CLASS C WEEDS.

The Klickitat County Noxious Weed Control Board through RCW 17.10 has listed the following Class C weeds to be designated for control on the county noxious weed list. Class C consists of any other noxious weeds. (RCW 17.10.010.2(c))

Common Name	***Scientific Name***
Austrian fieldcress *	*Rorippa austriaca*
black henbane	*Hyoscyamus niger*
buffalobur *	*Solanum rostratum*
hairy whitetop *	*Lepidium appelianum*
hoary cress *	*Lepidium draba*
jubata grass	*Cortaderia jubata*
Italian arum	*Arum italicum*
longspine sandbur *	*Cenchrus longispinus*
Nonnative cattails	*Typha species*
pampas grass	*Cordaderia selloana*
spikeweed *	*Centromadia pungens*
spiny cocklebur *	*Xanthium spinosum*
Swainsonpea *	*Sphaerophysa salsula*
thistle, Canada *	*Cirsium arvense*
yellow flag iris *	*Iris pseudacorus*

Weeds of Local Concern

These are additional non-native, invasive plant species that are of concern in Klickitat County. The Board encourages and recommends control and containment of existing populations, but control is not required.

common St. Johnswort *	*Hypericum perforatum*
jointed goatgrass *	*Aegilops cylindrica*
wild carrot *	*Daucus carota*

*indicates known population in Klickitat County

Attachment Veg-2: Potential for Rare Non-vascular Plants and Lichens to Occur within Survey Area

Attachment Veg-2
Potential for Rare Non-vascular Plants and Lichens to Occur within Survey Area

Washington Endangered, Threatened, and Sensitive Non-vascular Plants			
Species Name	**Status[1]**	**Potential to Occur in Project Area**	**Rationale**
Bartramiopsis lescurii	SE	Highly Unlikely	Only known from Snohomish County.
Brotherella roellii	ST	Highly Unlikely	All occurrences in Washington are historical and all specimens were collected prior to 1913. All historic occurrences are from the Cascades or further west.
Encalypta brevicollis	SE	Highly Unlikely	Only known occurrence in the Washington is from Pierce and Lewis counties. Occurrence is historical and was last observed in 1931.
Iwatsukiella leucotricha	SE	Highly Unlikely	Only known from the Northwest Coast Ecoregion
Orthotrichum praemorsum	SE	Highly Unlikely	Only known from one historical occurrence in Kittitas County
Scouleria marginata	ST	Highly Unlikely	The only known extant occurrence in Washington is from Klickitat County; however, the species is only known from bedrock or large boulders at the waterline of perennial rivers and streams; which doesn't occur in the Project Area.
Washington Endangered, Threatened, and Sensitive Lichens			
Species Name	**Status[1]**	**Potential to Occur in Project Area**	**Rationale**
Acroscyphus sphaerophoroides	SE	Highly Unlikely	Known from Glacier Peak Wilderness Area in Snohomish County
Alectoria nigricans (*Gowardia nigricans*)	ST	Highly Unlikely	Only known from western Washington
Alectoria ochroleuca	SE	Highly Unlikely	Only found in arctic and alpine regions
Arctoparmelia incurva	SE	Highly Unlikely	In Washington, only known from the Cascades
Bryoria tenuis	SE	Highly Unlikely	In Washington, only known from San Juan County
Bunodophoron melanocarpum	ST	Highly Unlikely	In Washington, only known from Clalam and Jefferson counties.
Catolechia wahlenbergii	SE	Highly Unlikely	In Washington, only known from Lewis County

Attachment Veg-2
Potential for Rare Non-vascular Plants and Lichens to Occur within Survey Area

Chaenotheca subroscida	SS	Highly Unlikely	Usually found near the base of old trees in shady and moist positions, in old coniferous forests; which doesn't occur in Project Area
Cladonia ciliata var. ciliata	SE	Highly Unlikely	In Washington, only known from Thurston County
Cladonia ciliata var. tenuis	SE	Highly Unlikely	In Washington, only known from Thurston County
Cladonia novochlorophaea	SE	Highly Unlikely	In Washington, only known from Thurston County
Cladonia poroscypha	SE	Highly Unlikely	In Washington, only known from Island and Skagit counties
Cladonia portentosa ssp. pacifica	ST	Highly Unlikely	Only known from western Washington
Collema nigrescens	SS	Highly Unlikely	Not known from Klickitat County
Dactylina arctica	SE	Highly Unlikely	In Washington, only known from Okanogan and Skamania counties
Dactylina ramulosa	SE	Highly Unlikely	In Washington, only known from Okanogan County
Dermatocarpon meiophyllizum	ST	Highly Unlikely	Not known from Klickitat County
Dermatocarpon moulinsii	SE	Highly Unlikely	In Washington, only known from Whatcom County
Erioderma sorediatum	ST	Highly Unlikely	Not known from Klickitat County
Fuscopannaria laceratula	SE	Highly Unlikely	In Washington, only known from Clallam County
Heterodermia leucomela	SE	Highly Unlikely	Only known from western Washington
Hypogymnia heterophylla	SS	Highly Unlikely	Only known from western Washington
Hypotrachyna revoluta	SE	Highly Unlikely	Only known from western Washington
Kaernefeltia californica	ST	Highly Unlikely	In Washington, only known from Grays Harbor County
Leioderma sorediatum	SE	Highly Unlikely	In Washington, only known from Clallam County
Leptogium burnetiae	SE	Highly Unlikely	In Washington, only known from Skamania and Snohomish counties
Leptogium cyanescens	SE	Highly Unlikely	In Washington, only known from Skamania and Snohomish counties
Nephroma occultum	SS	Highly Unlikely	Primarily restricted to old-growth forests; which is not found in Project Area
Niebla cephalota	SS	Highly Unlikely	Only known from western Washington
Pannaria rubiginella	SE	Highly Unlikely	In Washington, only known from Jefferson County
Peltigera hydrothyria	SS	Highly Unlikely	Only known from western Washington
Pertusaria coccodes	SE	Highly Unlikely	In Washington, only known from Clallam County
Pseudocyphellaria hawaiiensis	SE	Highly Unlikely	In Washington, only known from Grays Harbor County
Pseudocyphellaria rainierensis	SS	Highly Unlikely	Only known from western Washington

Attachment Veg-2
Potential for Rare Non-vascular Plants and Lichens to Occur within Survey Area

Ramalina pollinaria	ST	Highly Unlikely	Only known from western Washington
Ramalina thrausta	ST	Highly Unlikely	Only known from forested areas; which is not found in Project Area
Solorina saccata	SE	Highly Unlikely	Not known from Klickitat County
Stereocaulon myriocarpum	ST	Highly Unlikely	Listed as being known from Klickitat County in WNHP (2019); however, all documented occurrences in the Consortium of Lichen Herbaria (2023) are in western Washington.
Sulcaria spiralifera	SE	Highly Unlikely	Only known from western Washington
Texosporium sancti-jacobi	ST	Unlikely	Suitable habitat not present in Project Area
Thelomma mammosum	SS	Highly Unlikely	Only known from western Washington
Tholurna dissimilis	SS	Highly Unlikely	Only known from western Washington
Umbilicaria lambii	SE	Highly Unlikely	Only known from western Washington
Umbilicaria lyngei	SE	Highly Unlikely	Only known from western Washington
Umbilicaria phaea var. coccinea	SE	Highly Unlikely	In Washington, only known from Chelan and Douglas counties
Umbilicaria rigida	ST	Highly Unlikely	In Washington, only known from Clallam County
Umbilicaria scholanderi	SE	Highly Unlikely	Only known from western Washington
Usnea lambii	ST	Highly Unlikely	Only known from western Washington
Usnea longissima	SS	Highly Unlikely	Not known from Klickitat County
Usnea quasirigida	ST	Highly Unlikely	In Washington, only known from Skagit and Whatcom counties
Usnea subgracilis	SS	Highly Unlikely	In Washington, only known from Clallam and Pacific counties
Vulpicida tilesii	SE	Highly Unlikely	In Washington, only known from Jefferson County

[1] SE = State endangered, SS = State Sensitive, ST = State threatened

Sources:

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Attachment Veg-2
Potential for Rare Non-vascular Plants and Lichens to Occur within Survey Area

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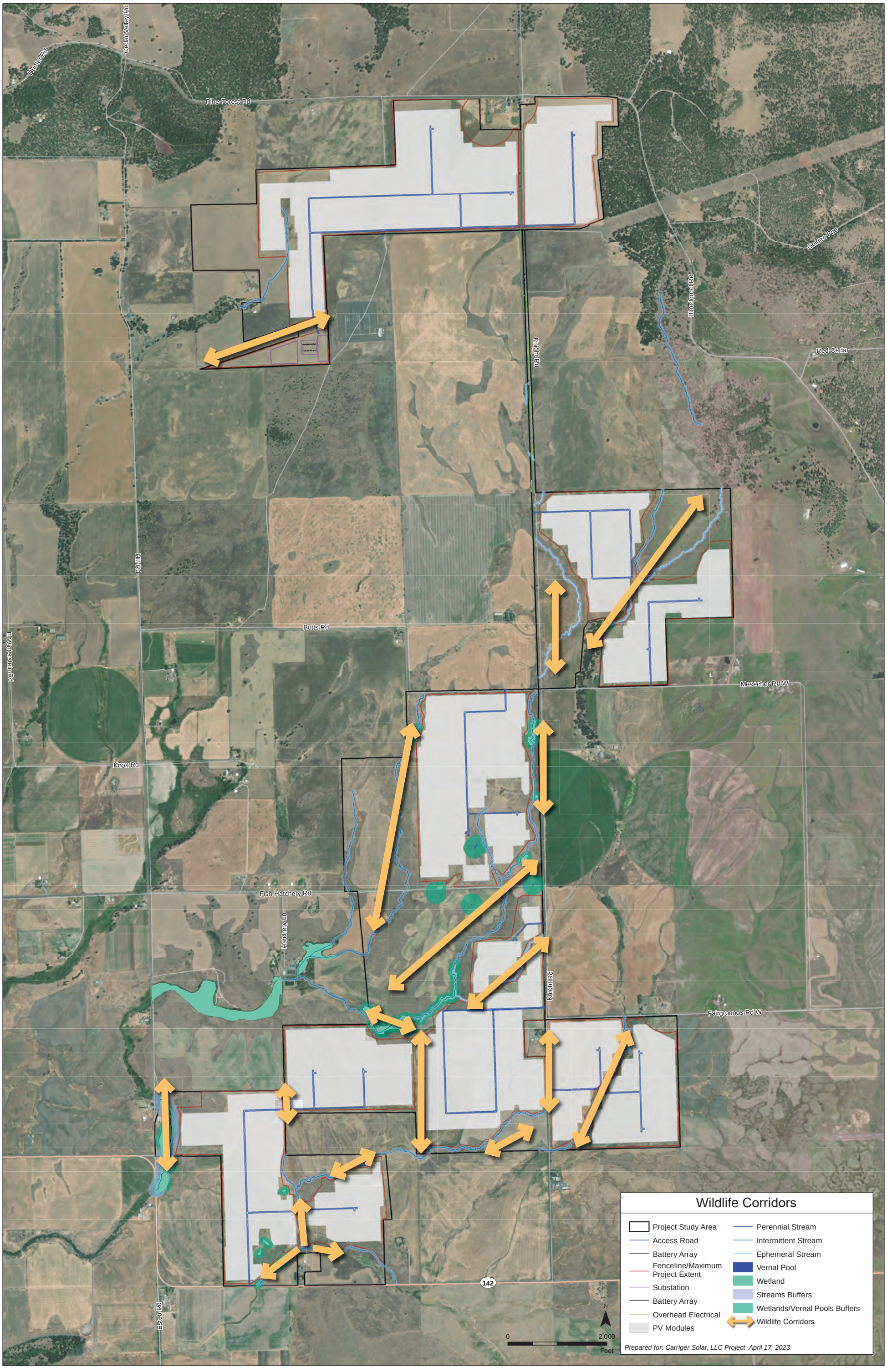
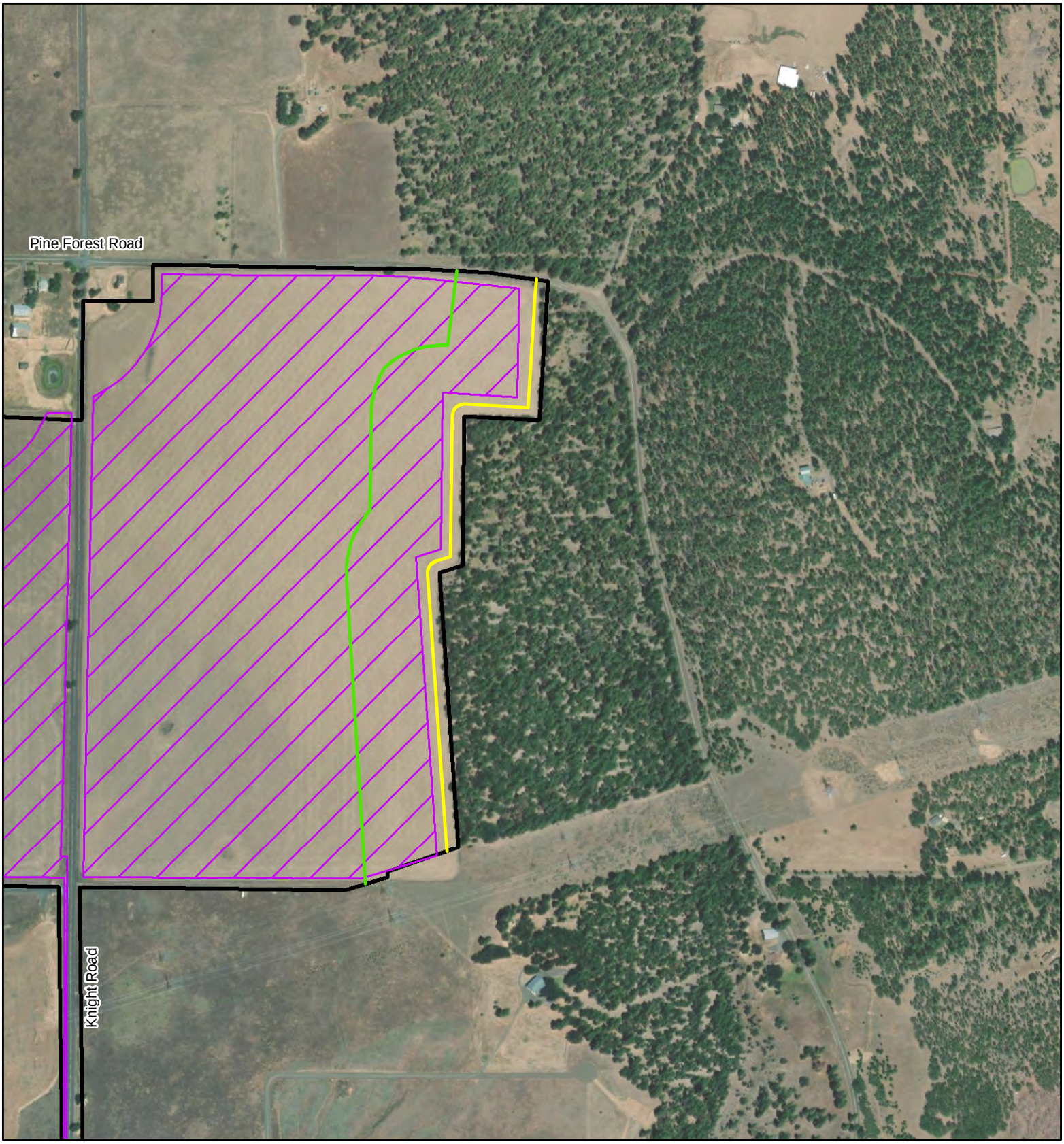
Personal communication with Jasa Holt, WNHP, December 13, 2022.

Attachment Wlf-1: Wildlife corridors figure


Hunter Rd
Cedar Valley Rd
Pine Forest Rd
Golden Pne
Bloodgood Rd
Knight Rd
Red Cedar
Hill Rd
Butts Rd
E Winterstein Rd
Mesecher Rd W
Knox Rd
Fish Hatchery Rd
Hatchery Ln
Knight Rd
Fairgrounds Rd W
Esteb Rd
142
N
0
2,000
Feet
Wildlife Corridors
Project Study Area
Access Road
Battery Array
Fenceline/Maximum Project Extent
Substation
Battery Array
Overhead Electrical
PV Modules
Perennial Stream
Intermittent Stream
Ephemeral Stream
Vernal Pool
Wetland
Streams Buffers
Wetlands/Vernal Pools Buffers
Wildlife Corridors
Prepared for: Carriger Solar, LLC Project April 17, 2023

Attachment Wlf-2: Western gray squirrel buffers



Project Site Control Boundary
Maximum Project Extent
Permanent 50-foot buffer
Seasonal 400-foot buffer

N

0 500 1,000
Feet

TETRA TECH

Western Gray Squirrel Buffers

Prepared for:
Carriger Solar, LLC Project
June 13, 2023

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