# 3.11 Noise and Vibration

This section describes the existing noise and vibration environment, as well as the regulatory setting, for the proposed Horse Heaven Wind Farm (Project, or Proposed Action) vicinity. The Project vicinity includes the areas 4 miles south/southwest of Kennewick, Washington, in Benton County, and the larger Tri-Cities urban area along the Columbia River. The Project's potential impacts to noise and vibration including consistency with relevant environmental standards, regulations, goals, and policies is evaluated in Section 4.11.

## *Acoustic Metrics and Terminology*

Acoustic values can be described in terms of noise or sound. Sound is generated by pressure fluctuations in the air. Noise is generally defined as any "unwanted" sound and is therefore based on human perception, but the terms "noise" and "sound" are often used interchangeably. Sound propagation involves three principal components: a sound source, a person or a group of people, and a transmission path. While two of these components, the sound source and the transmission path, are easily quantified (i.e., by direct measurements or through predictive calculations), the effect of noise on humans is hard to determine. It is difficult to predict a response from one individual because there is variation in how people perceive and react to noise.

Level of noise is related to magnitude of sound pressure, which is referred to as sound pressure level (SPL) and is measured in units called decibels (dB). The higher the decibel value, the louder the sound. Decibels are calculated as a logarithmic function of the measured SPL in the air in relation to a reference effective sound level of 0 dB, which is considered the hearing threshold. To account for human response to sound, it is common to use the A-weighted sound level (noted in units of dBA) in evaluating noise sources and their impacts on humans. The A-weighted scale expresses relative loudness as perceived by the human ear, by reducing sound levels mostly at low frequencies to which the human ear is less sensitive. Accordingly, A-weighted decibels will almost always be lower than unweighted decibels.

The following SPL data parameters are typically collected during a typical noise study:

- Leq – The equivalent continuous SPL averaged over the measurement period; this parameter is the continuous steady SPL that would have the same total acoustic energy as the real fluctuating noise over the same time.
- Lmax – The maximum SPL for the sampling period.
- Lmin – The minimum SPL for the sampling period.
- Ldn – The day-night average SPL is calculated with a 10 dBA "penalty" added to nighttime hours (10 p.m. to 7 a.m.). This is done to evaluate potential human response in residential land uses, where humans are more sensitive to nighttime noise impacts.
- Ln – The SPLs that were exceeded n percent of the time during the sampling period. For example, L90 is the level exceeded 90 percent of the time.

## *Vibration*

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Ground-borne noise occurs when vibration radiates through a building interior and creates a low-frequency sound, often described as a rumble, as when a train passes by (FTA 2018). However, in contrast to airborne noise, ground-borne vibration is not a common environmental

problem. It is unusual for vibration from sources such as large construction equipment to be perceptible at distances greater than 100 feet.

## *Regulatory Setting*

### Federal Regulations

There are no federal noise regulations applicable to the Project.

### Washington Administrative Code Statutes

Environmental noise limits have been established by Washington Administrative Code (WAC) 173-60. WAC 173-60 establishes limits on sounds crossing property boundaries 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 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 that tend to have noise levels higher than those normally experienced in other areas. Typical Class A EDNA uses generally are not permitted in such areas. Typically, Class C EDNA uses 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.

The noise level limits by EDNA classifications are presented in **Table 3.11-1**. 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. 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
- 15 dBA for no more than 1.5 minutes of any hour

WAC 173-60-050 exempts daytime noise generated by blasting and temporary daytime construction noise from the state noise limits.

**Table 3.11-1: Washington State Environmental Noise Limits**

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

Source: Washington Administrative Code 173-60-040
EDNA = Environmental Designation for Noise Abatement

**Table 3.11-2** shows a maximum noise limit of 60 dBA for a Class C noise source and a Class A receiving property, which is subject to a further reduction of 10 dBA during nighttime hours. The WAC regulatory limits are absolute and independent of the existing acoustic environment; therefore, an ambient sound survey is not required in order to determine conformance. However, based on the requirements under WAC 463-60-352 Built Environment – Environmental Health, and to describe and quantify the background noise environment, an ambient sound survey has been conducted for the Project. The original baseline survey was completed by Tetra Tech, commencing on December 22, 2020, and concluding on January 19, 2021 (Tetra Tech 2021). A supplemental baseline survey was completed by Tetra Tech to collect additional data, commencing on February 14, 2022, and concluding on March 1, 2022 (Horse Heaven Wind Farm, LLC 2022).

**Table 3.11-2: Ln Environmental Noise Limits for Class C Sources**

| EDNA of Source Property | EDNA of Receiving Property | | | |
|---|---|---|---|---|
| | Limit | Ln25 | Ln8.3 | L2.5 |
| **Class A Land (day/night)** | 60/50 | 65/55 | 70/60 | 75/65 |
| **Class B Land** | 65 | 70 | 75 | 80 |
| **Class C Land** | 70 | 75 | 80 | 85 |

Source: Washington Administrative Code 173-60-040 (b) and (c)
EDNA = Environmental Designation for Noise Abatement; Ln2.5 = SPL exceeded 2.5% of the time; Ln8.3 = SPL exceeded 8.3% of the time ; Ln25 = SPL exceeded 25% of the time; SPL = sound pressure level

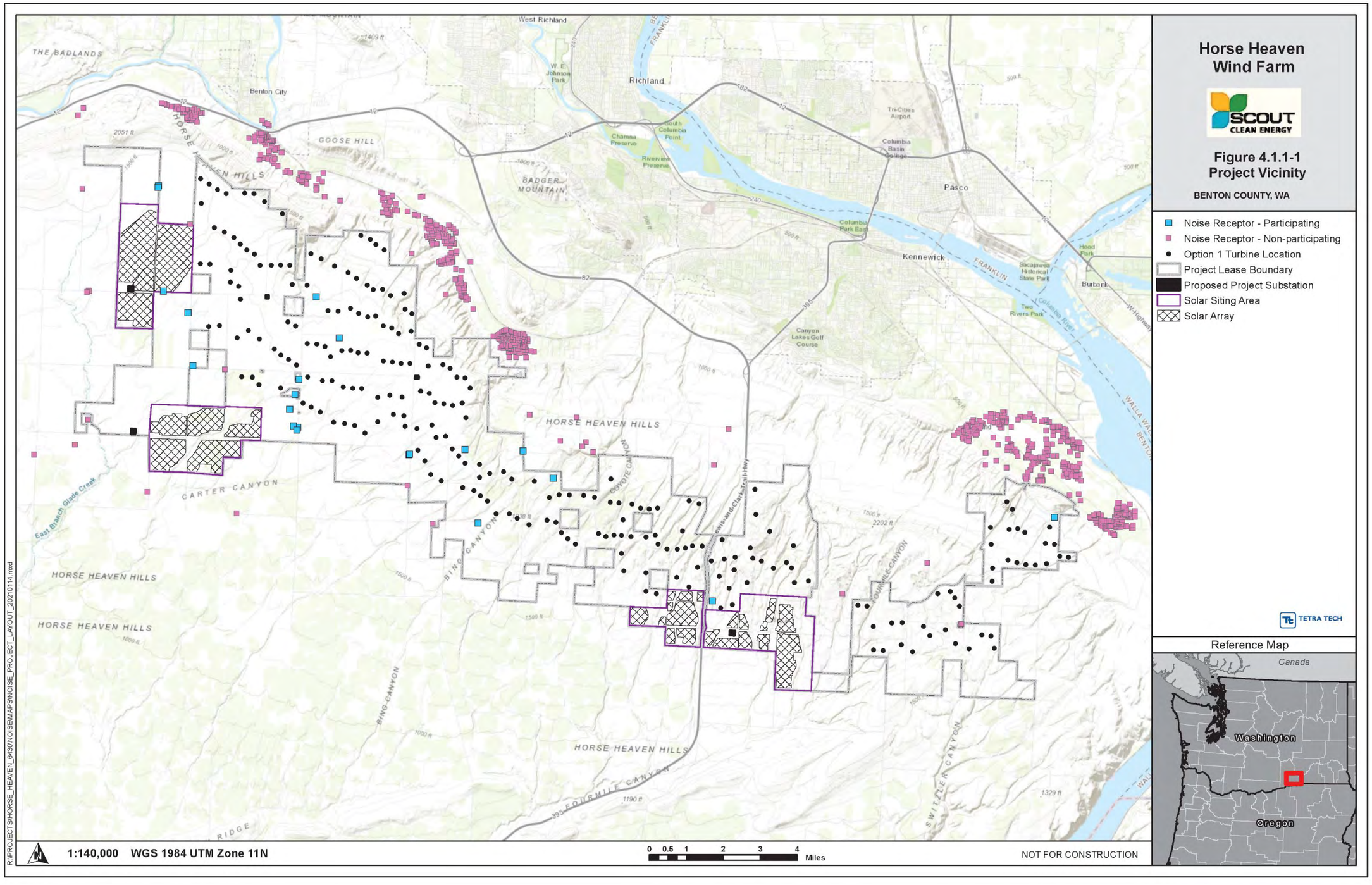
### Benton County Code

Chapter 6A.15 of the Benton County Code provides language pertaining to public disturbance and nuisance noise; however, sounds originating from industrial or commercial activities, as well as construction or refuse removal equipment, are exempt (Benton County 2021). The code requires all projects to comply with all noise regulations under WAC 173-60.

## 3.11.1 Affected Environment

The Project Lease Boundary is dominated by rolling hills bisected by meandering canyons, some of which constitute ephemeral or intermittent drainages. The Horse Heaven Hills ridgeline lies along the northern border of the Lease Boundary, particularly in the western portion. On the southern side of this ridge, the landscape transitions to relatively rolling topography with shallow, meandering canyons that drain southwest into the Columbia River. **Figure 3.11-1** provides an overview of the Project vicinity and provides the locations of nearby residences that are considered noise sensitive receptors (NSR). These receptors will be used to assess

compliance of the Project with WAC standards as a receiving property for noise. NSR locations typically include residences, hospitals, schools, parks, and churches, and, for the purposes of this study, represent Class A EDNA receiving land uses. Impacts from the Proposed Action at NSR locations will consider their current acoustic environment, as well as future sources of noise.




Source: Horse Heaven Wind Farm, LLC 2021

**Figure 3.11-1: Noise Sensitive Receptors in Project Vicinity**

Variations in acoustic environment and vibration are due in part to:

- Existing land uses
- Population density
- Proximity to transportation corridors

Elevated existing ambient sound levels in the region occur near major transportation corridors such as Interstate 82 (I-82) and in areas with higher population densities such as Benton City or Kennewick (Horse Heaven Wind Farm, LLC 2021). The Lease Boundary is primarily open land or rural in nature and will have comparatively lower ambient sound levels, possibly 30 dBA or less during nighttime, due to the limited number of anthropogenic noise sources. Principal contributors to the existing acoustic environment likely include:

- Motor vehicle traffic
- Mobile farming equipment
- Farming activities such as plowing and irrigation
- All-terrain vehicles
- Local roadways
- Rail movements
- Periodic aircraft flyovers
- Natural sounds such as birds, insects, and leaf or vegetation rustle during elevated wind conditions

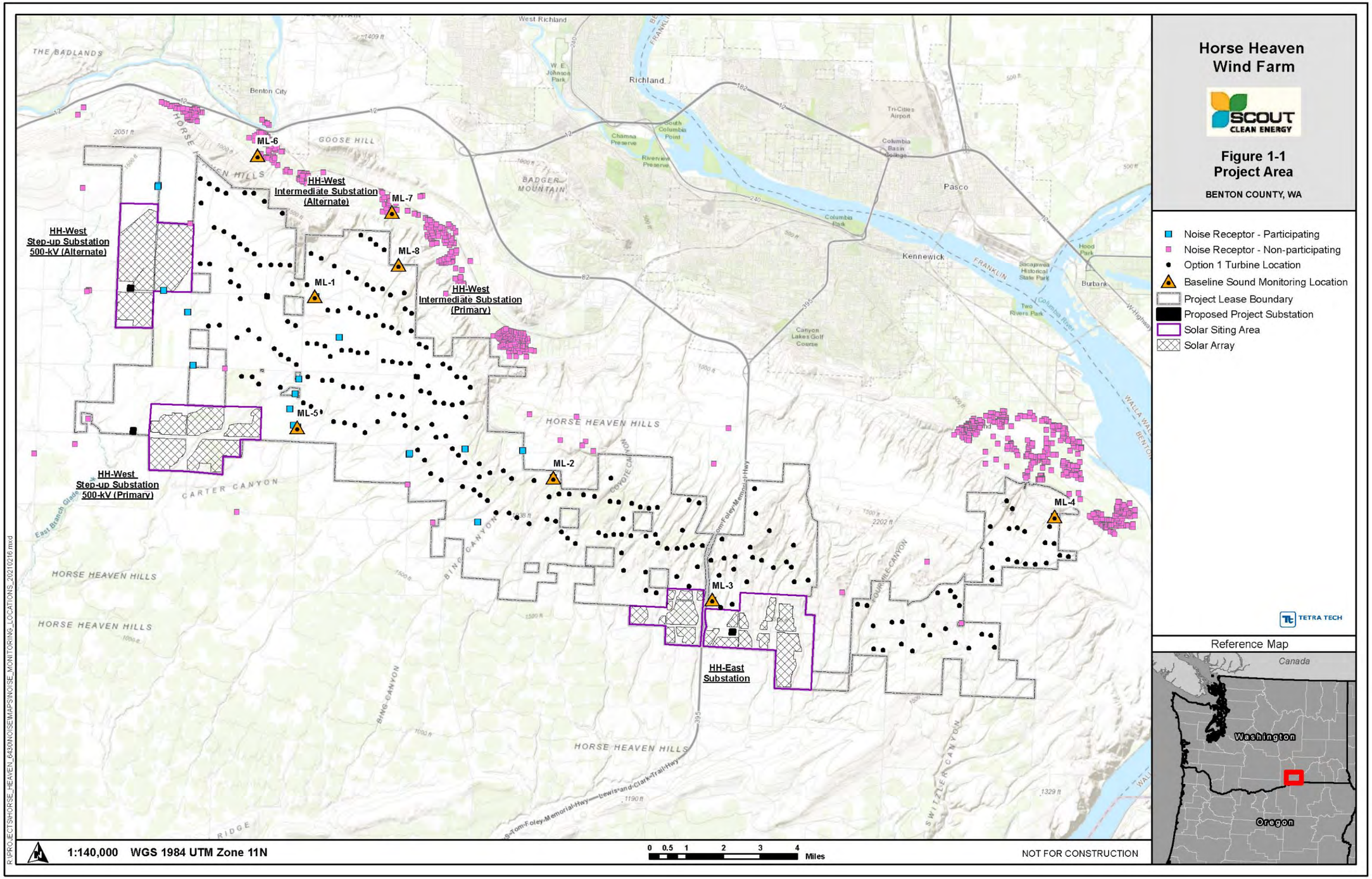
Noise sources are typically louder and more numerous during the daytime than at night—referred to as a “diurnal” pattern. This diurnal pattern typically results in sound levels that are quieter at night than during the daytime, except during periods when evening and nighttime insect noise dominate in warmer seasons.

Ground-borne vibration generated by human activities (e.g., rail and roadway traffic, operation of mechanical equipment and typical construction equipment) typically diminishes rapidly with distance from the vibration source. The Federal Transit Administration uses a screening distance of 100 feet for highly vibration-sensitive buildings (e.g., hospitals with vibration-sensitive equipment) and 50 feet for residential uses and historic buildings (FTA 2018). Vibration-sensitive receptors generally include historic buildings, buildings in poor structural condition, and uses that require precision instruments (e.g., hospital operating rooms or scientific research laboratories). Given the current land uses in the Project vicinity, existing vibrations in the area would be assumed to be at a typical background level and well below the human threshold of perception. No vibration measurements were collected for this study.

#### *3.11.1.1 Ambient Noise Surveys*

To document ambient sound levels within the Project Lease Boundary and vicinity, two baseline sound surveys were conducted by Tetra Tech. The original survey was submitted as an addendum to Appendix O of the Application for Site Certification in February 2021 (Horse Heaven Wind Farm, LLC 2021; Tetra Tech 2021). A supplemental noise survey was conducted to collect data at additional locations and was submitted (Horse Heaven Wind Farm, LLC 2022). For these two surveys, seven NSR locations and one boundary location were selected as monitoring positions for the baseline sound survey. These locations were selected because they are

spatially distributed throughout the area and would represent the existing acoustic environment. **Figure 3.11-2** shows the Lease Boundary and vicinity and the location of the eight baseline sound monitoring stations.




Source: Horse Heaven Wind Farm, LLC 2022

**Figure 3.11-2: Baseline Sound Monitoring Stations in Project Vicinity**

The baseline sound survey commenced on December 22, 2020, and concluded on January 19, 2021. Data were collected at each monitoring location for a period of approximately 14 days within that window. A long-term baseline survey is necessary to provide a statistically relevant data set, covering the full range of wind speeds and future operational scenarios. A 10-day monitoring period, weather permitting, provides a representative period to obtain baseline data set. The monitoring locations, dates, and sample type are presented in **Table 3.11-3** and **Figure 3.11-2**.

**Table 3.11-3: Monitoring Locations Included in the Baseline Noise Study**

| Monitoring Location | Geographic Coordinates[(a)] | | Location Description | Observations |
|---|---|---|---|---|
| | Latitude | Longitude | | |
| ML-1 | 311134E | 5117731N | Residence along Henson Road in Prosser | Quiet, with agricultural activities and sporadic noise from animals on site. |
| ML-2 | 321518E | 5109850N | Residence along C Williams Road in Kennewick | Very quiet, with no roadway noise heard. |
| ML-3 | 328433E | 5104539N | Residence along S. Bofer Canyon Road in Benton County | Some distant roadway noise from I-82. |
| ML-4 | 343329E | 5108162N | Residence along Finley Road in Kennewick | Distant farming activity and noise from geese could also be heard. |
| ML-5 | 310369E | 5112039N | Residence along S. Travis Road in Prosser | Moderate agricultural activity and semi-frequent road traffic along S. Travis Road. |
| ML-6 | 308632E | 5123877N | Property along N McBee Road in Benton City | Local and distant road traffic. |
| ML-7 | 314483E | 121403N | Residence along Canyon View Pr Northeast in Benton City | Minor agricultural activity, some construction, local traffic. |
| ML-8 | 314766E | 119102N | Near Project Lease Boundary east of Dennis Road in Benton City | Infrequent agricultural activity. |

Sources: Tetra Tech 2021, Horse Heaven Wind Farm, LLC 2022
Notes:
[(a)] Universal Transverse Mercator Zone 11T
I-82 = Interstate 82; ML = Monitoring Location

**Table 3.11-4** displays the average daytime and nighttime ambient sound levels for each monitoring location and the Project Lease Boundary and vicinity for wind speed conditions ranging from calm to maximum rotational wind speed. Ambient sound levels fluctuated constantly during both daytime and nighttime hours, but generally followed a diurnal pattern, and sound levels generally increased with the increase of wind speed.

**Table 3.11-4: Baseline Sound Survey Results, Leq (Average dBA)**

| Monitoring Location | Time Period | Wind Speed (m/s) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| ML-1 | Day | 32 | 32 | 33 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| | Night | 33 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| ML-2 | Day | 33 | 33 | 33 | 32 | 32 | 32 | 33 | 33 | 33 | 33 |
| | Night | 31 | 32 | 32 | 32 | 33 | 33 | 34 | 34 | 34 | 34 |
| ML-3 | Day | 48 | 48 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 |
| | Night | 42 | 43 | 44 | 45 | 46 | 46 | 47 | 48 | 48 | 48 |
| ML-4 | Day | 38 | 38 | 39 | 39 | 39 | 40 | 40 | 40 | 40 | 40 |
| | Night | 36 | 37 | 37 | 38 | 38 | 38 | 39 | 39 | 39 | 39 |
| ML-5 | Day | 45 | 45 | 45 | 45 | 44 | 44 | 44 | 44 | 45 | 45 |
| | Night | 39 | 39 | 39 | 39 | 39 | 39 | 40 | 40 | 41 | 41 |
| ML-6 | Day | 42 | 42 | 43 | 44 | 44 | 45 | 46 | 47 | 48 | 49 |
| | Night | 39 | 40 | 41 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
| ML-7 | Day | 37 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 |
| | Night | 30 | 32 | 34 | 36 | 37 | 39 | 41 | 42 | 44 | 45 |
| ML-8 | Day | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 |
| | Night | 25 | 28 | 32 | 34 | 37 | 40 | 42 | 44 | 47 | 49 |
| Cumulative | Day | 37 | 38 | 39 | 40 | 41 | 41 | 42 | 43 | 43 | 44 |
| | Night | 34 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 |

Source: Horse Heaven Wind Farm, LLC 2022; Tetra Tech 2021
dBA = A-weighted decibels; Leq = the equivalent continuous sound pressure level averaged over the measurement period; ML = Monitoring Location; m/s = meters per second

- Location ML-1 – This location was an exception to the diurnal variation, with daytime noise levels ranging from 32 to 39 dBA and nighttime noise levels ranging from 33 to 41 dBA. Increases in daytime ambient sound levels at ML-1 can be attributed to the agricultural activities occurring on the site.
- Location ML-2 – Ambient sound levels were consistently low and ranged from 32 to 33 dBA during the daytime and 31 dBA to 34 dBA at night. While some sporadic on-site activity and roadway noise contributed to daytime sound levels, the ambient acoustic environment at ML-2 is quiet.
- Location ML-3 – Ambient sound levels were relatively higher due to this location's proximity to I-82 and range from 47 to 48 dBA during the daytime and 42 to 48 dBA at night. The maximum noise level represents noise generated from highway traffic being similar during the day and night. The greater range at night indicates lower frequency of traffic during that specific time period.
- Location ML-4 – Ambient sound levels were slightly higher during the day than at night and ranged from 38 to 40 dBA during the day and 36 to 39 dBA at night. This location best represents the more densely populated land uses in the Lease Boundary as it was located near the community of Finley, to the northeast of the Lease Boundary.
- Location ML-5 – Ambient sound levels exhibited typical diurnal variation but were affected by both nearby agricultural activity and traffic-related noise occurring on S. Travis Road and ranged from 44 to 45 dBA during the daytime and 39 to 41 dBA at night.

- Location ML-6 – Ambient sound levels were relatively higher due to this location's proximity to I-82 (less than 1 mile), local traffic, and proximity to a more densely populated area. The noise levels range from 42 to 49 dBA during the daytime and 39 to 49 dBA at night. The maximum noise level represents noise generated from traffic and higher wind speeds in a high-density vegetation area. This location best represents Benton City.
- Location ML-7 – Ambient sound levels were slightly higher during the day than at night and ranged from 37 to 45 dBA during the day and 30 to 45 dBA at night. The results suggest more anthropogenic noise sources during the daytime, with elevated noise levels coming from higher winds, local traffic, and equipment operations.
- Location ML-8 – Ambient sound levels exhibited typical diurnal variation and were also notably affected by wind speeds with higher noise levels mostly occurring during high wind events. The location is more remote, near the Project Lease Boundary and the noise levels ranged from 32 to 50 dBA during the daytime and 25 to 49 dBA at night.

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# 3.12 Recreation

This section describes the recreation uses and areas that would be affected by the proposed Horse Heaven Wind Farm (Project, or Proposed Action). Washington Administrative Code 463-60-362 states that "the application shall list all recreational sites within the area affected by the construction and operation of the facility and shall then describe how each will be impacted by the construction and operation." Section 4.12 describes impacts on recreation that could result from the construction, operation, and decommissioning of the Proposed Action or No Action Alternative.

## *Background*

Areas devoted to recreation provide people with the opportunity to engage with and enjoy the natural and built environment. Outdoor recreation is an important aspect of life for residents of the Horse Heaven Hills area, and it provides economic benefits to the communities. The Project's study area for recreation includes existing recreation resources and activities within the Project's Lease Boundary and the 25 miles surrounding the Lease Boundary. With the exception of 10 acres that the Washington State Department of Natural Resources (DNR) manages on behalf of the state's citizens, private entities own the entire 72,428 acres within the Lease Boundary.

Recreational facilities, defined by Revised Code of Washington 36.69.010, can include, but are not limited to:

- Parks
- Coliseums for the display of spectator sports
- Playgrounds
- Public campgrounds
- Gymnasiums
- Boat ramps and launching sites
- Swimming pools
- Public hunting and fishing areas
- Field houses
- Arboretums
- Bathing beaches
- Bicycle and bridle paths
- Stadiums
- Senior citizen centers
- Golf courses
- Automobile racetracks and drag strips
- Community centers
- Other recreational facilities

The following sections describe existing recreational opportunities and conditions in the study area, separated into three categories: county and private recreational opportunities, state recreational opportunities, and federal recreational opportunities.

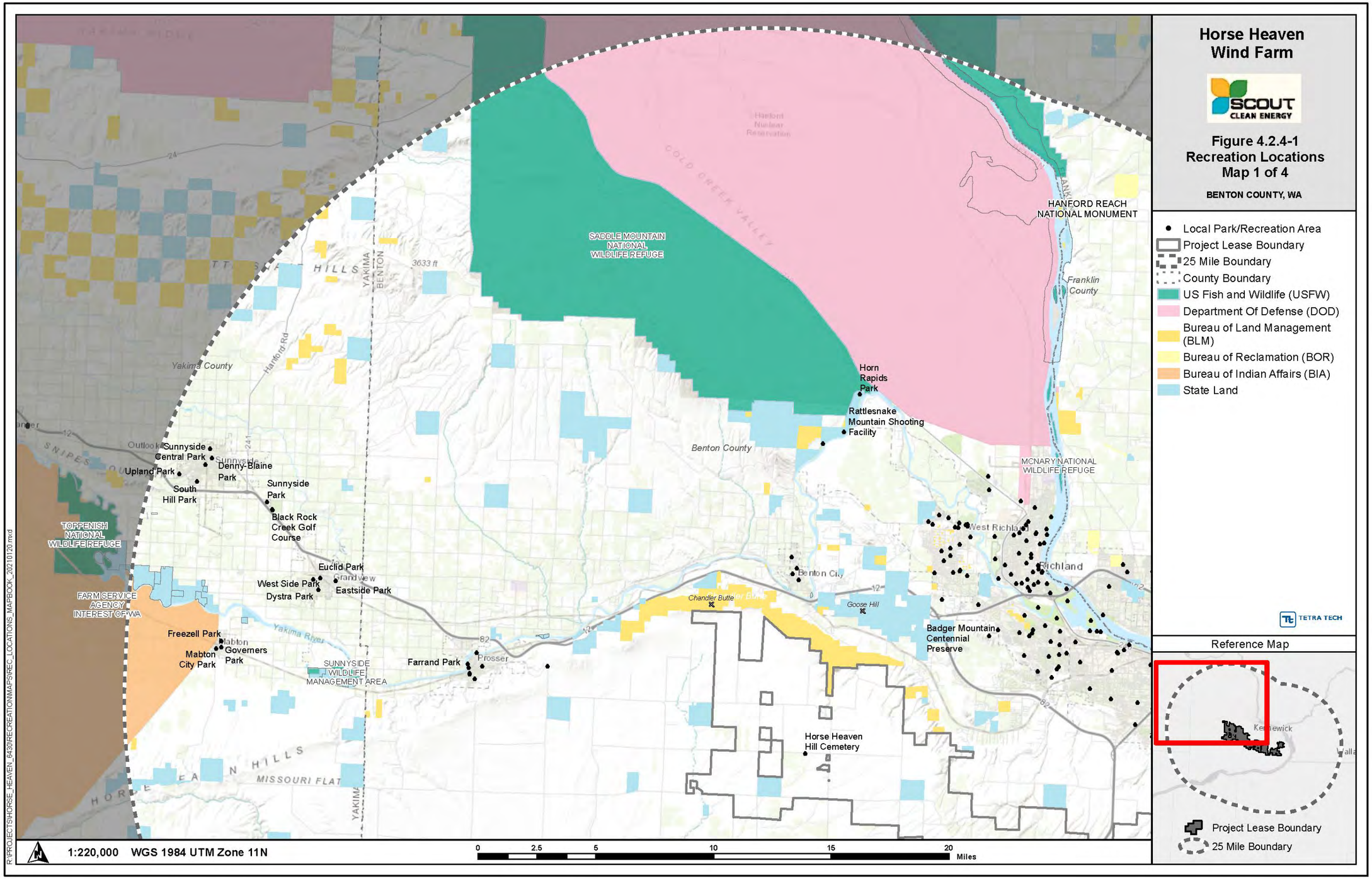
## 3.12.1 Affected Environment

The study area for recreation resources is in the southeastern portion of Washington and portions of northern Oregon and includes lands within the following counties:

- Benton County, Washington
- Franklin County, Washington
- Yakima County, Washington
- Walla Walla County, Washington

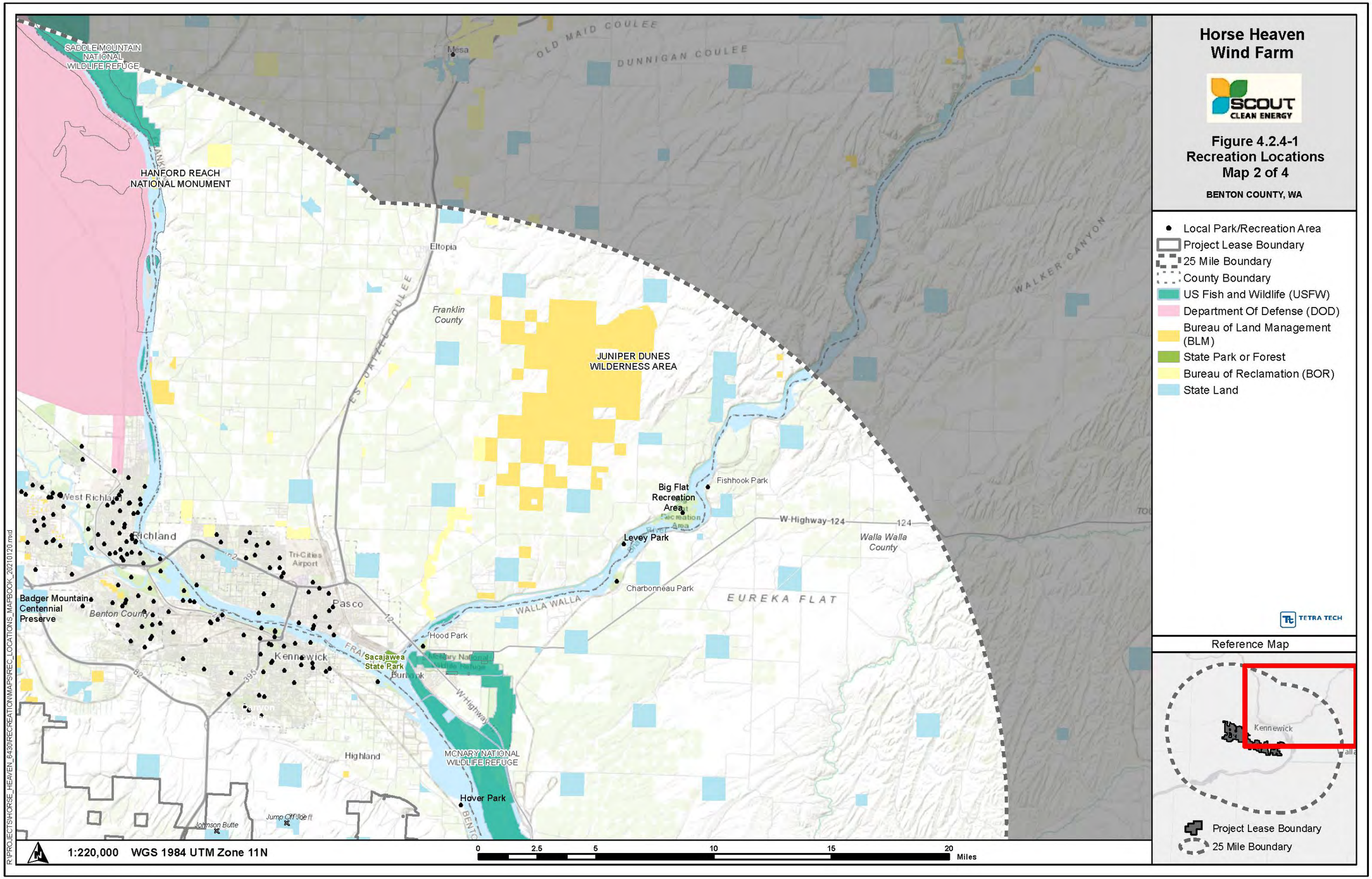
- Klickitat County, Washington
- Morrow County, Oregon
- Umatilla County, Oregon

These lands offer recreational opportunities, including parks and places for camping, hiking, hunting, fishing, boating, swimming, wildlife viewing (including bird watching), and recreational sports (e.g., paragliding). Activities related to each recreation site are discussed in the next sections under each land use administrator. **Figures 3.12-1 through 3.12-4** show the locations of recreation resources within the study area.



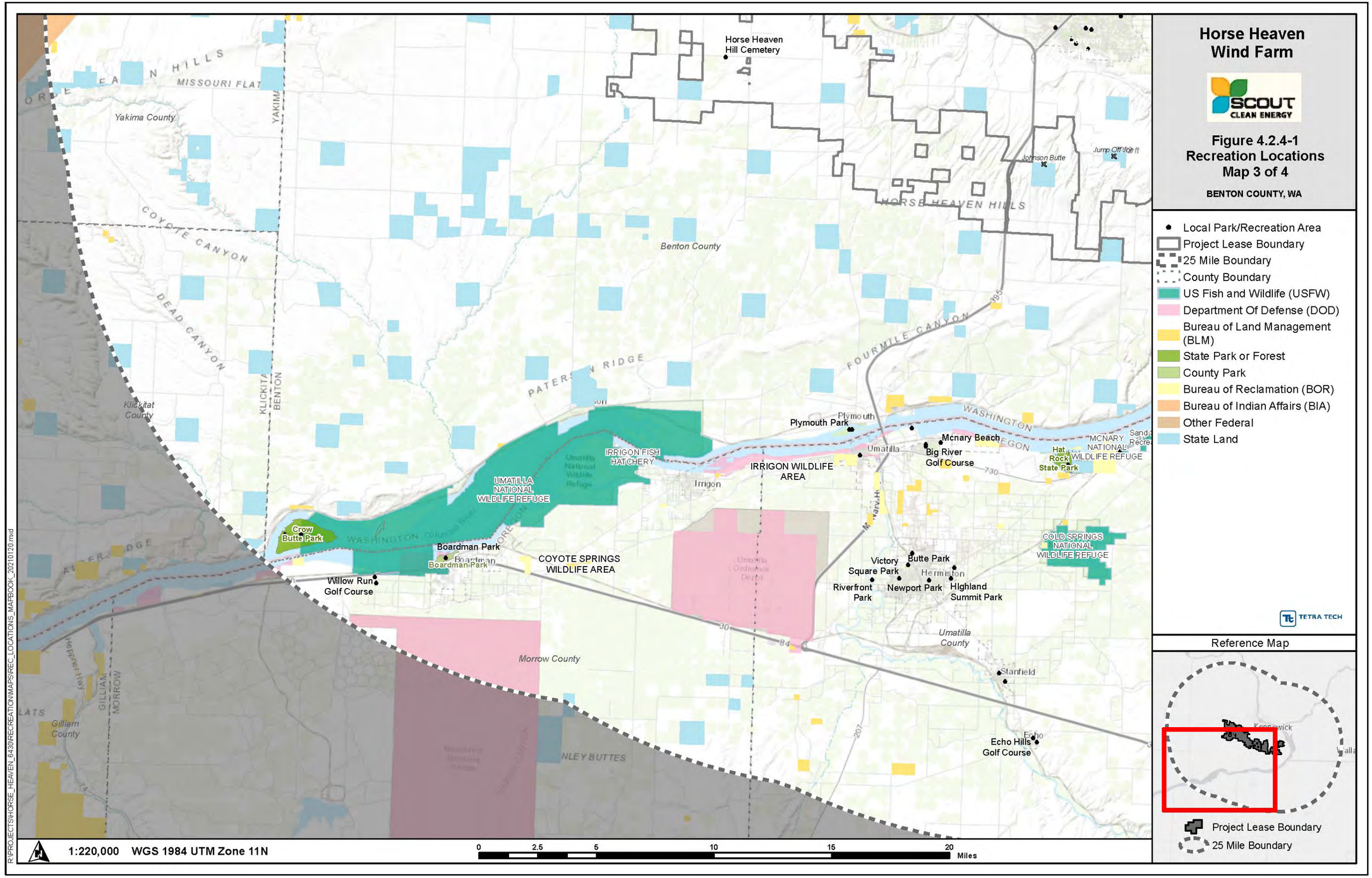

Source: Horse Heaven Wind Farm, LLC 2021a

**Figure 3.12-1: Recreation Location Map 1 of 4**



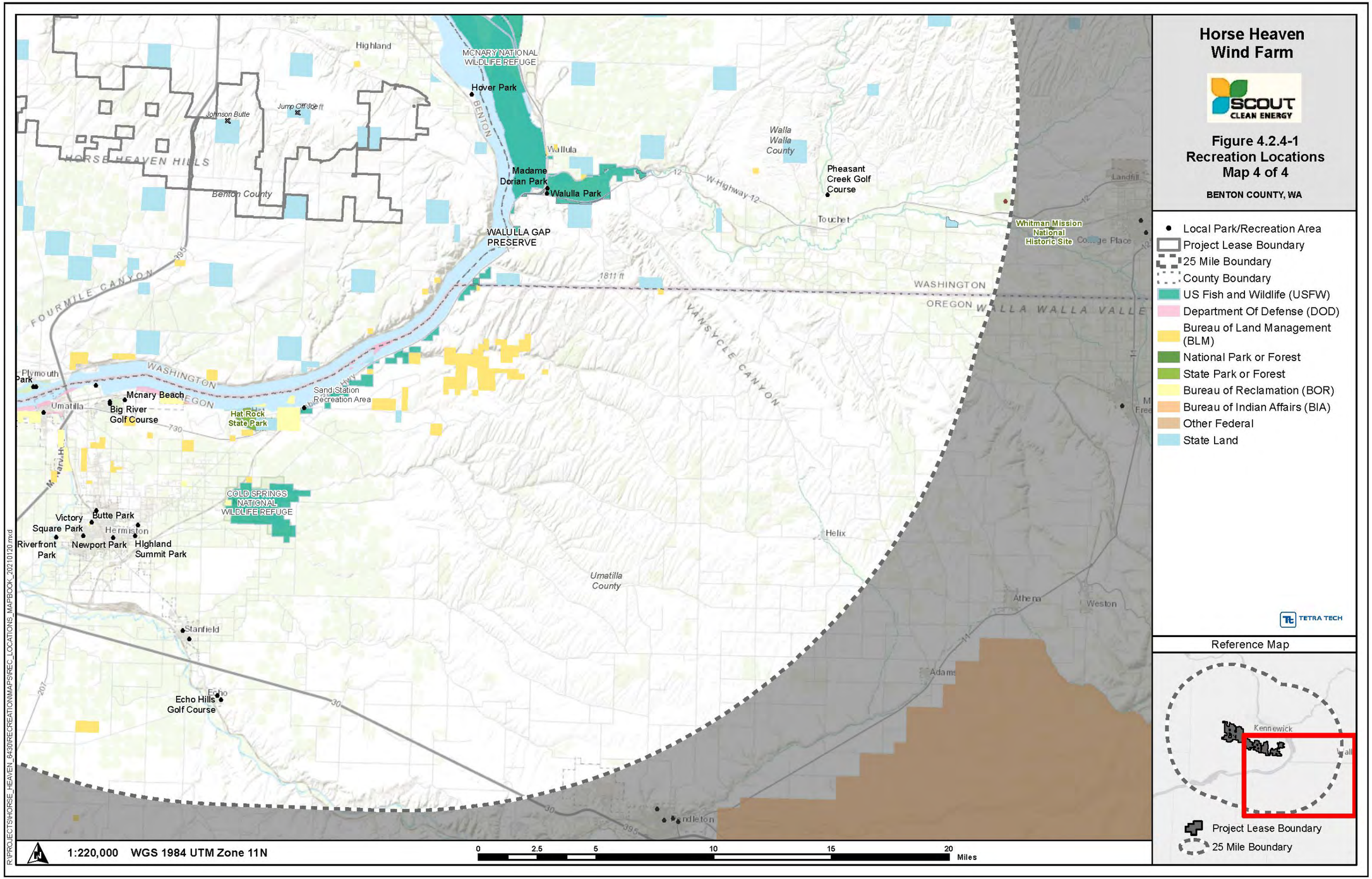

Source: Horse Heaven Wind Farm, LLC 2021a

**Figure 3.12-2: Recreation Location Map 2 of 4**




Source: Horse Heaven Wind Farm, LLC 2021a

**Figure 3.12-3: Recreation Location Map 3 of 4**




Source: Horse Heaven Wind Farm, LLC 2021a

**Figure 3.12-4: Recreation Location Map 4 of 4**

### *3.12.1.1 County and Private Resources*

County and local lands in the study area that offer recreational activities include areas managed and operated by the counties and private landowners. Comprehensive plans contain general goals, policies, and objectives applicable to the recreation resources within the study area. The following comprehensive plans influence recreational activities within the study area:

- Benton County Comprehensive Plan
- Walla Walla County Comprehensive Plan
- Umatilla County Comprehensive Plan
- Morrow County Comprehensive Plan
- Yakima County Comprehensive Plan
- Kennewick Comprehensive Parks and Recreation Plan
- City of Pasco Parks, Recreation, and Forestry Plan
- City of Richland Parks and Recreation Master Plan
- Benton City Comprehensive Plan
- City of Umatilla Comprehensive Land Use Plan
- City of Boardman Comprehensive Plan
- Hermiston Parks, Recreation and Open Space Master Plan
- City of Prosser Parks and Recreation Plan
- City of Grandview Comprehensive Plan
- City of Grandview Comprehensive Parks, Recreation and Open Space Plan

The county plans all identify goals, objectives, and policies that protect and maintain resources and preservation of land use while promoting development, local coordination, and education. For example, the Benton County Comprehensive Plan encourages the retention of open space and development of recreation opportunities, conservation of fish and wildlife habitat, increased access to natural resource lands and water, and development of parks (Benton County 2021). **Table 3.12-1** summarizes the county and local recreation resources within the study area.

**Table 3.12-1: County and Regional Resources and Activities within the Recreation Study Area**

| Recreation Resource Name[(a)] | Management | Distance from Lease Boundary (nearest point of resource) | Description |
|---|---|---|---|
| Horse Heaven Cemetery | Benton County | Within Project Lease Boundary | A 2-acre historical burial ground established in 1893 and formed as a Benton County park in 2012. Offers a small hiking trail and a historic attraction. |
| Hover Park | Benton County | 1.5 miles east | A day-use park that offers large areas of undeveloped scenic views, wildlife viewing, fishing, and small multi-use trails. |
| Wallula Gap Preserve | Benton County | 3 miles southeast | This National Natural Landmark is a preservation area that remains undeveloped and generally inaccessible. |
| Badger Mountain Centennial Preserve | Benton County | 4 miles northwest | Offers large areas of undeveloped scenic views, bird watching, multi-use trails, and horseback riding. |

**Table 3.12-1: County and Regional Resources and Activities within the Recreation Study Area**

| Recreation Resource Name[(a)] | Management | Distance from Lease Boundary (nearest point of resource) | Description |
|---|---|---|---|
| Two Rivers Park | Benton County | 4.5 miles northeast | Although owned by Corps of Engineers, this facility is leased to Benton County. Offers playgrounds, open space, swimming, boating, golfing, hiking, bathroom facilities, and parking. Open year round, from 6 a.m. to 10 p.m. in the summer, and during daylight hours in the winter. |
| Candy Mountain Preserve | Benton County | 5 miles northwest | Offers large areas of undeveloped scenic views and small multi-use trails. |
| Vista Park | Benton County | 5 miles northeast | Offers playgrounds, open space, bathroom facilities, and parking. Originally developed by the Vista Junior Women's Club in 1970, Vista is the County's smallest park. |
| Rattlesnake Mountain Shooting Facility | Benton County | 8 miles northwest | Located on land leased by Benton County from Washington State and the BLM; offers various shooting discipline ranges. The Tri-City Shooting Association operates the Rattlesnake Mountain Shooting Facility on behalf of Benton County. |
| Horn Rapids Park | Benton County | 9 miles northwest | An 800-acre site owned and operated by Benton County since the 1960s and the only Benton County park where overnight camping is available. In addition to the campground, Horn Rapids Park has a horse camp, model airplane facility, boat launch, and miles of multi-use trails. |
| Horse Heaven Vista | Benton County | 7 miles west | Offers large areas of undeveloped scenic views and small hiking trails or biking. |
| Boardman Parks and Recreation District | Morrow County | 20.1 miles southwest | A recreational area managed by Morrow County, Oregon. The site consists of over 100 acres of land available to the public and includes 5 day-use parks, boating, swimming, walking trails, and areas for RV camping. |

Sources: Horse Heaven Wind Farm, LLC 2021a; Benton County n.d.
Notes:
[(a)] There are 208 small local parks found within the study area. These various parks are shown in **Figures 3.12-1 through 3.12-4** but are not listed individually in this table.
BLM = Bureau of Land Management; RV = recreational vehicle

The remaining recreation resources within the study area are all local facilities. Three of the 208 facilities are within 5 miles of the Lease Boundary:

- Canyon Lakes Golf Course (3.3 miles north of the Lease Boundary)
- Shark Reef Water Park (3.8 miles north of the Lease Boundary)
- Bombing Range Road Sports Complex (5 miles northeast of the Lease Boundary)

Local facilities provide recreational features, including playgrounds, fields, athletic courts, boat ramps, trails, and restrooms.

Multiple use paths are a popular feature within the study area. Badger Road runs 12 miles in Benton County, effectively connecting the Tri-City metropolitan area to Weber Canyon Road near Benton City, Washington. This route is popular with recreationists, particularly cyclists. Benton County is proposing to add two 6-foot-wide bike lanes along 7 miles of Badger Road, from the City of Kennewick to Dallas Road. Currently, several cycling organizations use this route for events. The road is also listed as a popular route on maps produced by the Benton Franklin Council of Governments. These maps also indicate that the route merits caution in its current form due to the condition of the road (e.g., lack of bike lanes) and amount of traffic (Benton County 2022).

#### *3.12.1.2 State of Washington and Oregon Resources*

State lands that offer recreational activities in the study area include:

- Washington State Department of Natural Resources
- Washington State Parks
- Oregon Parks and Recreation Department
- Oregon Department of Fish and Wildlife

**Table 3.12-2** summarizes the state recreation resources within the study area.

**Table 3.12-2: State Resources and Activities within the Recreation Study Area**

| Recreation Resource Name | Management | Distance from Lease Boundary (nearest point of resource) | Description |
|---|---|---|---|
| Johnson Butte | DNR | Within Project Lease Boundary | A low-elevation mountain peak that offers unofficial hiking opportunities, as well as paragliding launch points. |
| Jump Off Joe Butte | DNR | 1.5 miles east | A low-elevation mountain peak that offers unofficial hiking opportunities, as well as paragliding launch points. |
| Chandler Butte | DNR | 1.8 miles northwest | A low-elevation mountain peak that offers unofficial hiking opportunities, as well as paragliding launch points. |
| Goose Hill Butte | DNR | 2 miles northwest | A low-elevation mountain peak that offers unofficial hiking opportunities, as well as paragliding launch points. |
| Sacajawea Historical State Park | Washington State Parks | 5.2 miles north | A 267-acre day-use park with hiking trails, restroom facilities, boating, and camping activities. |
| Hat Rock State Park | OPRD | 8.1 miles south | A day-use area offering picnicking sites, wildlife viewing, fishing, boating, hiking, and restroom facilities on the south shore of Lake Wallula. |
| Irrigon Wildlife Area | ODFW | 11 miles southwest | Part of the greater Columbia Basin Wildlife Area, Irrigon is a 979-acre day-use site for hunting, fishing, wildlife viewing and some accommodations for camping. |

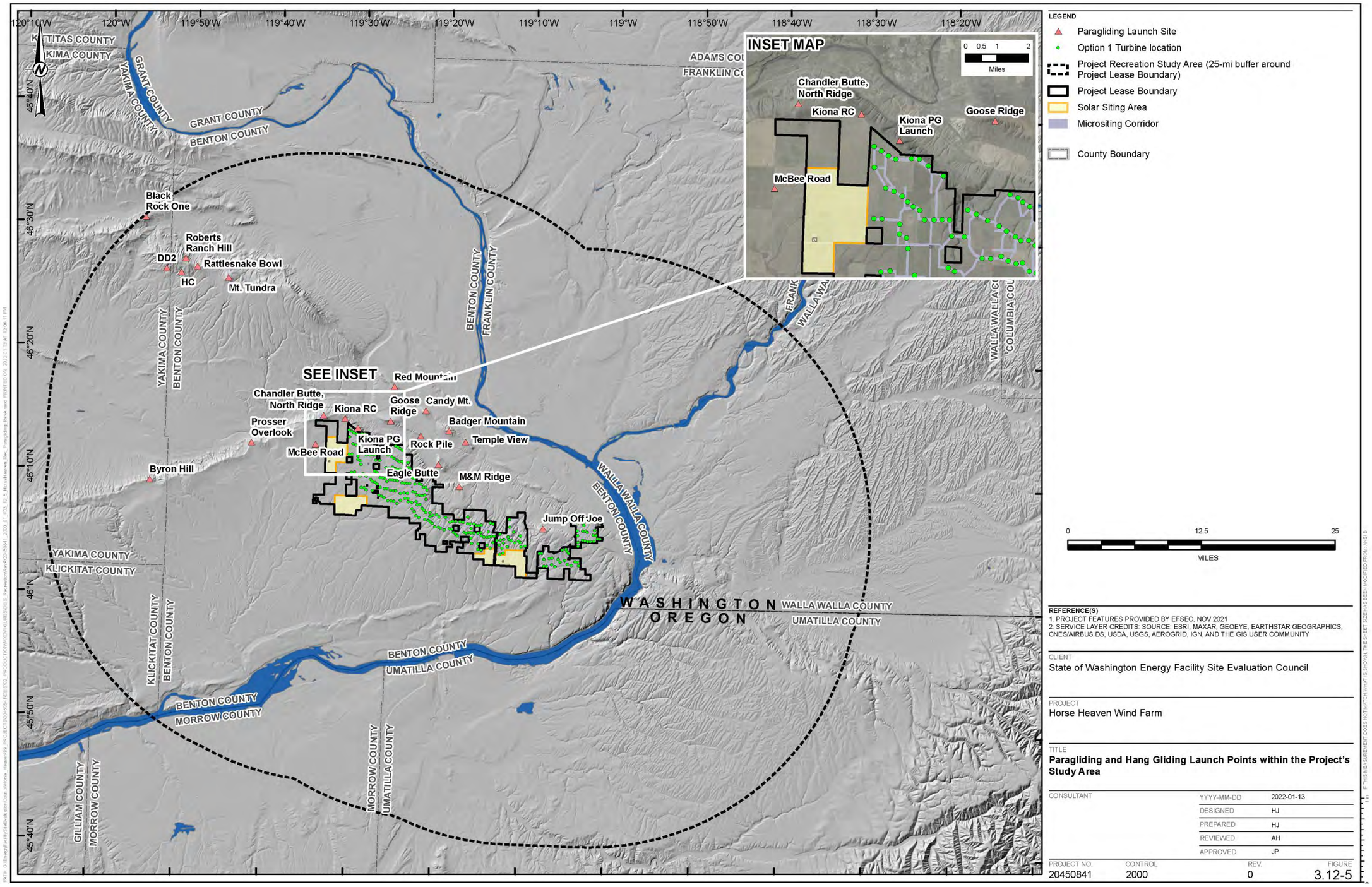
**Table 3.12-2: State Resources and Activities within the Recreation Study Area**

| Recreation Resource Name | Management | Distance from Lease Boundary (nearest point of resource) | Description |
|---|---|---|---|
| Coyote Springs Wildlife Area | ODFW | 21 miles southwest | Part of the greater Columbia Basin Wildlife Area, the Coyote Springs Wildlife Area encompasses approximately 160 acres and offers day-use activities, including hunting, with some accommodations for camping. |

Sources: ODFW 2008, 2022; Horse Heaven Wind Farm, LLC 2021a; DNR 2022; OSP 2022; Washington State Parks n.d.(a), n.d.(b)
Notes:
The DNR also manages lands within the Lease Boundary that are accessible for public hunting. The Washington Department of Fish and Wildlife oversees game management units on DNR-managed lands.
DNR = Washington State Department of Natural Resources; ODFW = Oregon Department of Fish and Wildlife; OPRD = Oregon Parks and Recreation Department

## *Paragliding and Hang Gliding*

Hang gliding, paragliding, and cross-country parasailing occur at approximately 20 locations within the study area on both state and federally managed lands, as shown in **Figure 3.12-5**. Launch sites nearest to the Lease Boundary follow Kiona Ridge (officially known as Chandler Butte), McBee Road, and starting to the west of the Bureau of Land Management (BLM)-administered McBee Trailhead. It is estimated that roughly 100 individuals may launch from Kiona Ridge in a year (Horse Heaven Wind Farm, LLC 2021b). Flights from Kiona Ridge are logged voluntarily by pilots using a global flight database, which shows 300 flights since 2010 from Kiona Ridge with a variety of flight paths and landing locations (Paragliding Forum n.d.). Both federal and state agencies are aware that paragliders and hang gliders launch from lands near the Lease Boundary, and no permit is required so long as it is “casual use” (Smith 2021). From Kiona Ridge, gliders typically launch south and land north of the ridge, although landing sites can cross the Lease Boundary. Depending on wind and weather conditions, cross-country gliders can fly to the Columbia River and across into Oregon.




**REFERENCE(S)**
1. PROJECT FEATURES PROVIDED BY EFSEC, NOV 2021
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

CLIENT
State of Washington Energy Facility Site Evaluation Council

PROJECT
Horse Heaven Wind Farm

TITLE
**Paragliding and Hang Gliding Launch Points within the Project's Study Area**

CONSULTANT

| | |
|---|---|
| YYYY-MM-DD | 2022-01-13 |
| DESIGNED | HJ |
| PREPARED | HJ |
| REVIEWED | AH |
| APPROVED | JP |

| PROJECT NO. | CONTROL | REV. | FIGURE |
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| 20450841 | 2000 | 0 | 3.12-5 |

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**Figure 3.12-5: Paragliding and Hang Gliding Launch Points within the Recreation Study Area**

### *3.12.1.3 Federal Resources*

This section reviews recreational areas designed, constructed, designated, or used for recreational activities. This assessment does not include protected lands held for potential mining and logging use or restricted lands, although these lands may be used by recreationists (hunters, fishermen, etc.). Federal lands that offer recreational activities include the lands administered by the BLM, U.S. Fish and Wildlife Service, National Park Service, and U.S. Army Corps of Engineers. **Table 3.12-3** summarizes the federal recreation resources within the study area. Land within the study area is identified by BLM public data as "an undeveloped watchable wildlife and watchable wildflowers area. Popular with locals, it is primarily used for hiking, nature viewing, photography, and mountain biking" (BLM n.d.).

**Table 3.12-3: Federal Resources and Activities Publicly Accessible within the Study Area**

| Recreation Resource Name | Management | Distance from Lease Boundary (nearest point of resource) | Description |
|---|---|---|---|
| Ice Age Floods National Geologic Trail | NPS | Varies[(a)] | Details regarding routes and features provided in **Table 3.12-2**. |
| Hood Park | USACE | 6.5 miles northeast | A campground that offers boating, fishing, and swimming activities. |
| Sand Station Recreation Area (Lake Wallula) | USACE | 8 miles south | A day-use facility that offers boating, fishing, and swimming activities. |
| Charbonneau Park | USACE | 12.5 miles northeast | A campground that offers boating, fishing, and swimming activities. |
| Fishhook Park | USACE | 18.5 miles northeast | A campground that offers boating, fishing, and swimming activities. |
| Crow Butte Park | USACE | 22.2 miles southwest | A campground that offers boating, fishing, and swimming activities. |
| McNary National Wildlife Refuge | USFWS | 2.7 miles east | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |
| Saddle Mountain National Wildlife Refuge | USFWS | 8.7 miles north | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |
| Cold Springs National Wildlife Refuge | USFWS | 11.3 miles south | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |

**Table 3.12-3: Federal Resources and Activities Publicly Accessible within the Study Area**

| Recreation Resource Name | Management | Distance from Lease Boundary (nearest point of resource) | Description |
|---|---|---|---|
| Umatilla National Wildlife Refuge | USFWS | 11.4 miles southwest | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |
| Irrigon Fish Hatchery | USFWS | 13.9 miles south | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |
| Hanford Reach National Monument | USFWS | 14.3 miles north | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |
| Sunnyside Wildlife Management Area | USFWS | 15 miles west | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |
| Washington Farm Service Agency Tracts | USFWS | 24.7 miles west | A day-use facility, except as modified by fishing and hunting regulations. Recreational activities include fishing, hunting, watching wildlife, and hiking. |
| McBee Trailhead (Horse Heaven Hills) | BLM | 1.5 miles northwest | A non-designated hiking and biking trail adjacent to the Project's Lease Boundary. Paragliding and hang gliding are known to occur near this location. |
| Juniper Dunes OHV Area / ACEC Wilderness Area | BLM | 15.3 miles northeast | A BLM-administered, 19,600-acre land package that comprises 3,920 acres of loose-sand riding for OHVs. |

Sources: USFWS 2013a, 2013b, 2013c, 2014; Horse Heaven Wind Farm, LLC 2021a; BLM n.d.; USACE n.d.(a), n.d.(b), n.d.(c), n.d.(d)
Notes:
[a] Features of the Ice Age Floods National Geologic Trail within the study area are further detailed in **Table 3.12-4.**
ACEC = Area of Critical Environmental Concern; BLM = Bureau of Land Management; OHV = off-highway vehicle; USACE = U.S. Army Corps of Engineers; USFWS = U.S. Fish and Wildlife Service

### *Ice Age Floods National Geologic Trail (IAF-NGT)*

The IAF-NGT is a network of geological features left behind by a series of cataclysmic floods that occurred at the end of the most recent Ice Age, when glacially dammed lakes ruptured and large volumes of water rushed through the northwestern United States (NPS 2014; IAFI 2021). Although there are no IAF-NGT routes or features within the Lease Boundary, there are primary and secondary routes and features within the study area. The primary and secondary IAF-NGT routes and features within the study area are shown in **Figures 3.12-6 through 3.12-9.**

The route of the trail, designated by the Omnibus Public Land Management Act of 2009, encompasses several federal and state highways, National Scenic Byways, and multiple loops and spurs across a vast, varied landscape with more than 350 sites and features created by the Ice Age floods (NPS 2014).

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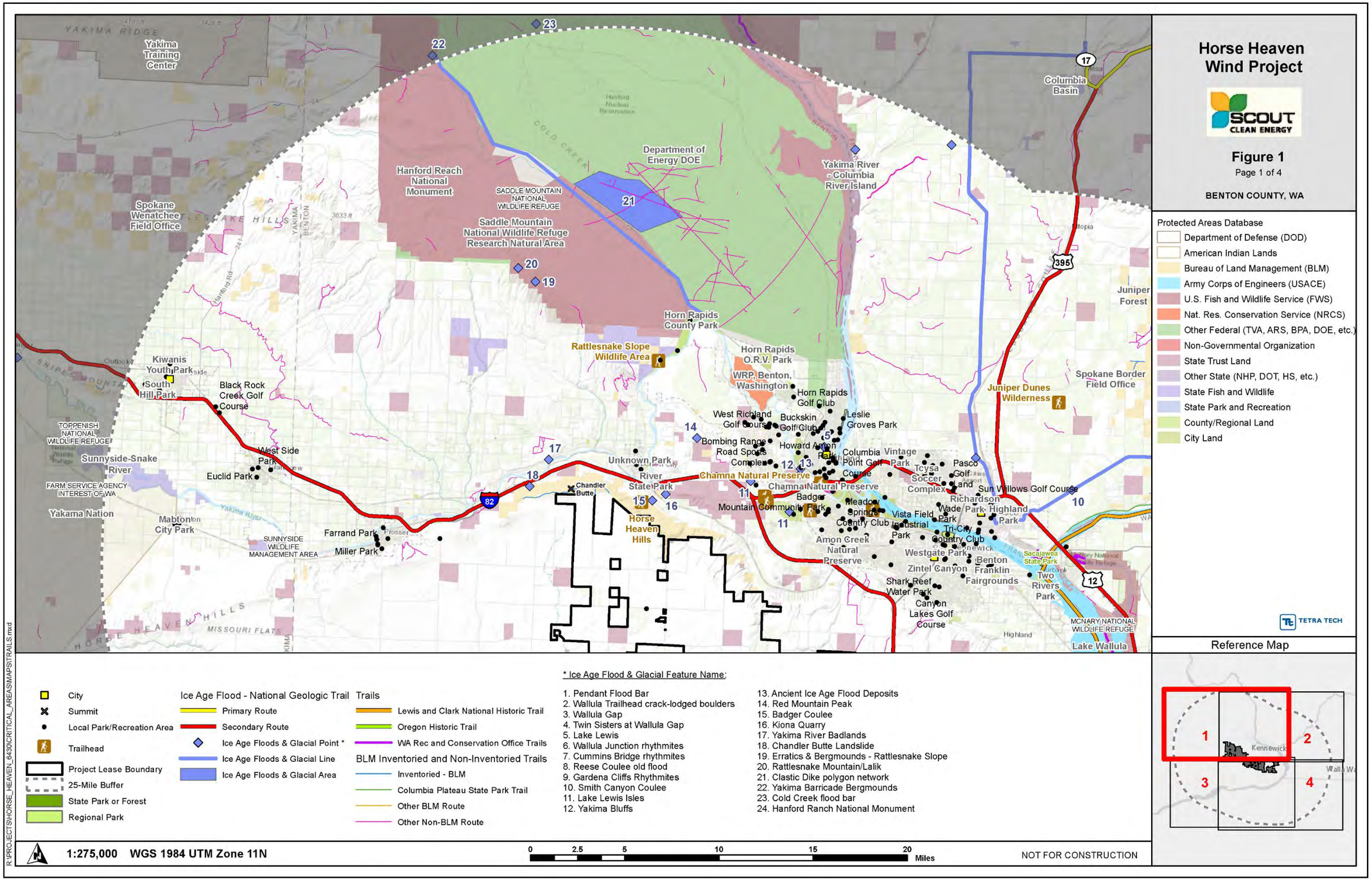
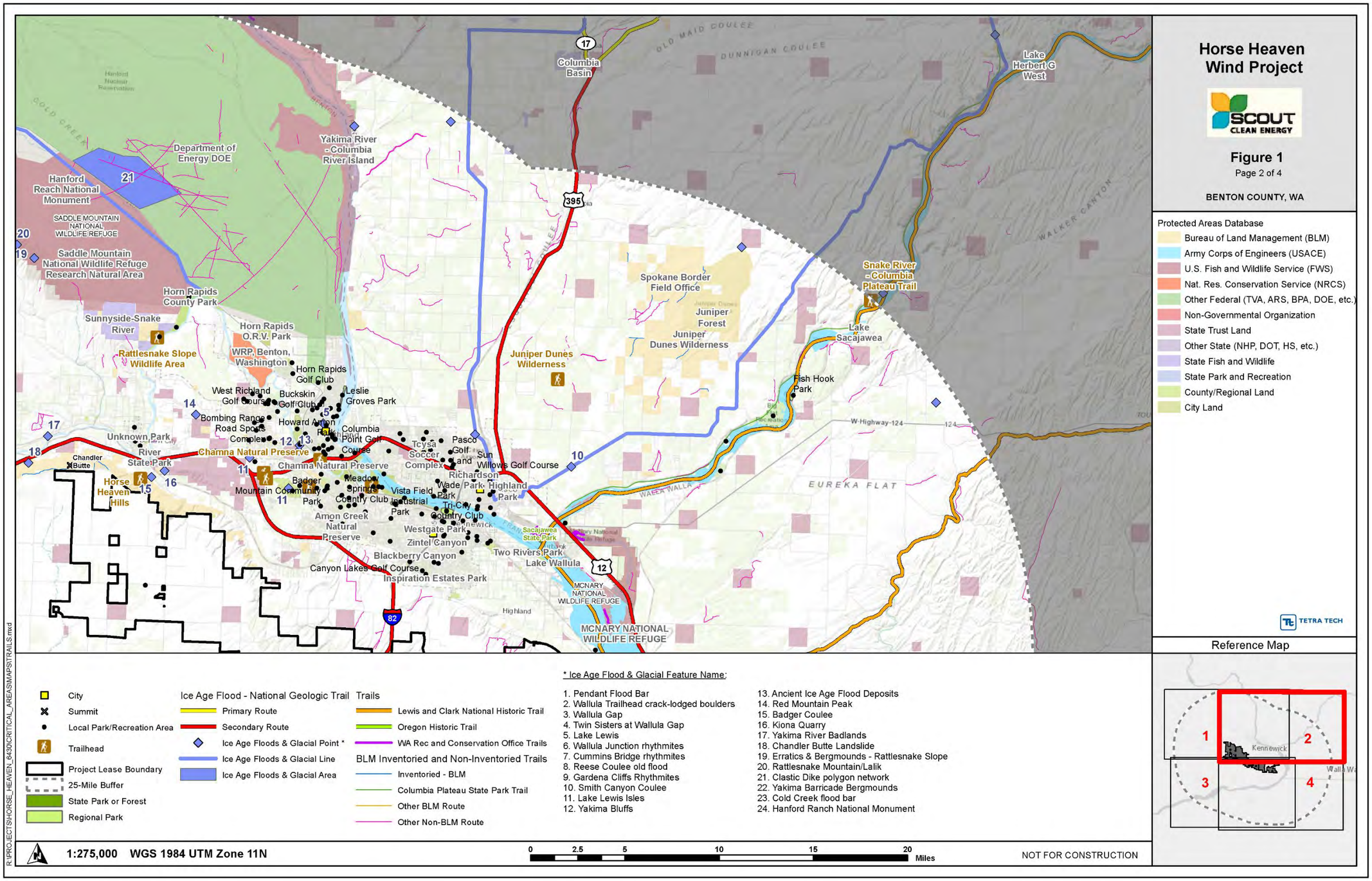


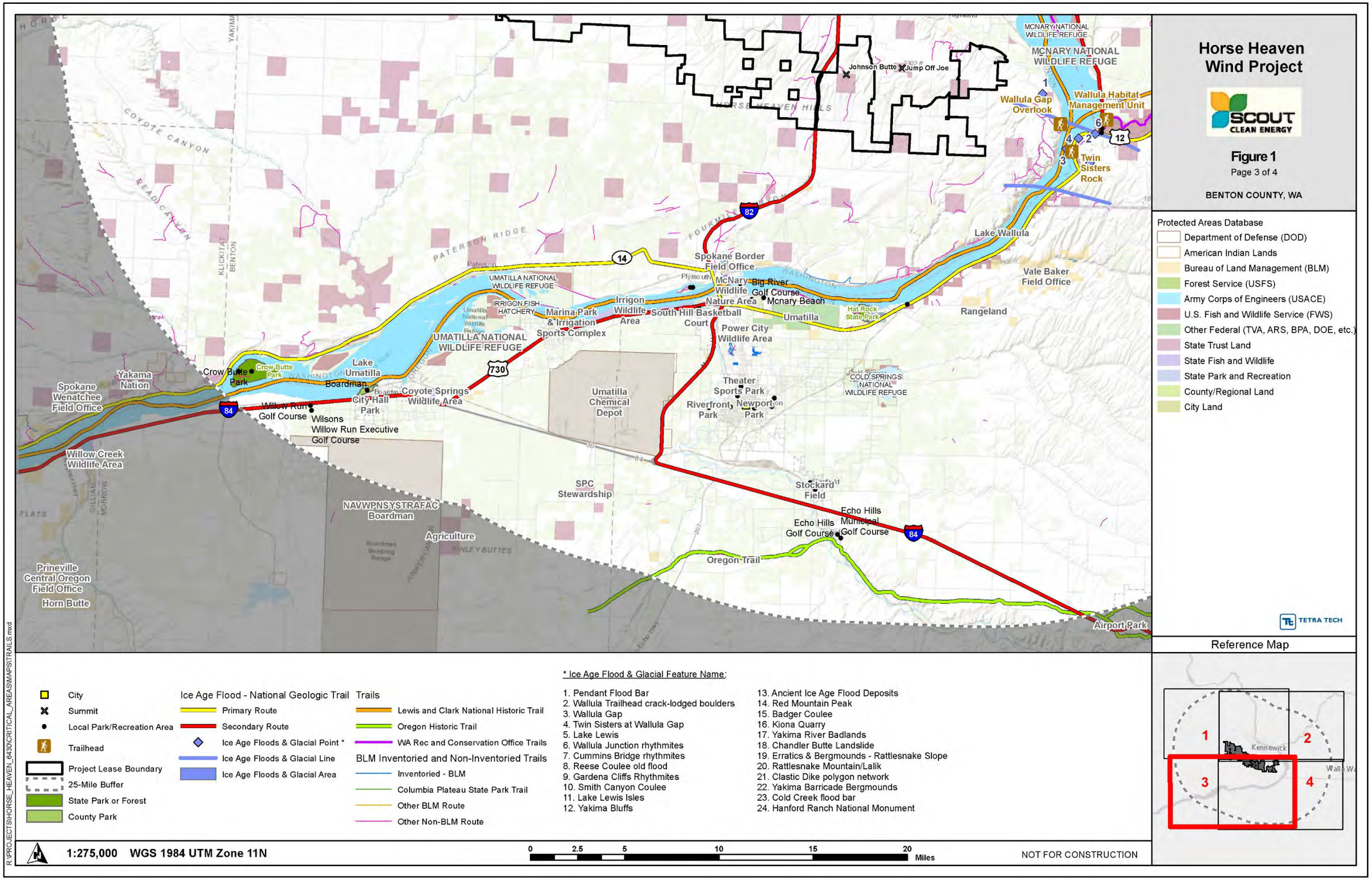

Source: Horse Heaven Wind Farm, LLC 2021c

**Figure 3.12-6: IAF-NGT Features within the Study Area, Map 1 of 4**



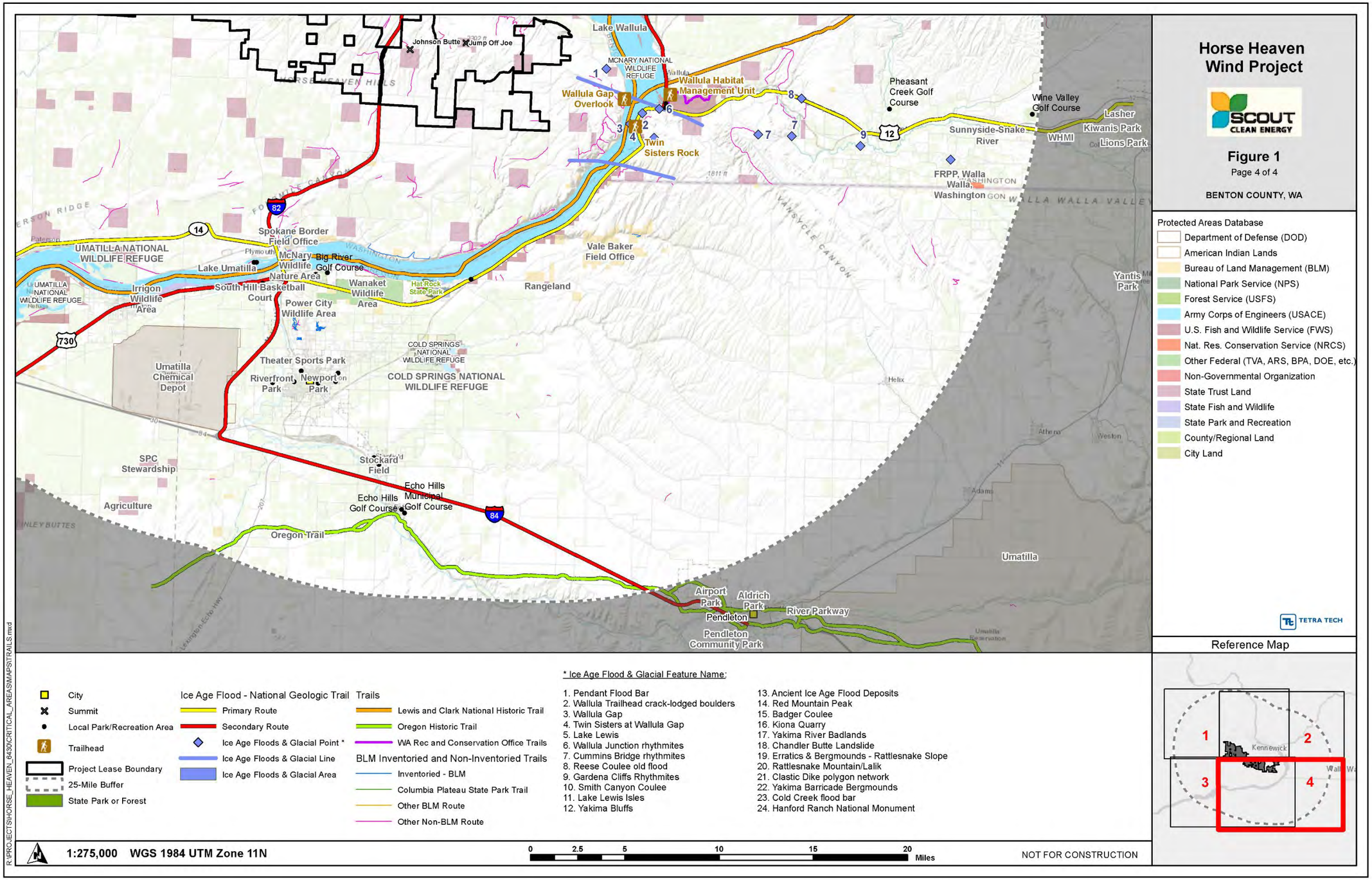

Source: Horse Heaven Wind Farm, LLC 2021c

**Figure 3.12-7: IAF-NGT Features within the Study Area, Map 2 of 4**




Source: Horse Heaven Wind Farm, LLC 2021c

**Figure 3.12-8: IAF-NGT Features within the Study Area, Map 3 of 4**




Source: Horse Heaven Wind Farm, LLC 2021c

**Figure 3.12-9: IAF-NGT Features within the Study Area, Map 4 of 4**

The pathways of these floods extend more than 1,300 linear miles across the region. They begin in the intermountain valleys of western Montana and traverse northern Idaho, central and eastern Washington, and northern Oregon to the coast near Cape Disappointment. The IAF-NGT is one of the few national trails in the United States that focuses on natural, rather than human, history (NPS 2014). The IAF-NGT routes and features and their distances from the Lease Boundary are shown in **Table 3.12-4**.

**Table 3.12-4: Ice Age Floods National Geologic Trail Resources within the Recreation Study Area**

| Feature #[(a)] | IAF-NGT Features within Study Area | Approximate Distance from Lease Boundary (miles) |
|---|---|---|
| 1 | Pendant Flood Bar | 1.97 |
| 2 | Wallula Trailhead crack-lodged boulders | 4.73 |
| 3 | Wallula Gap | 4.29 |
| 4 | Twin Sisters at Wallula Gap | 4.61 |
| 5 | Lake Lewis | 7.67 |
| 6 | Wallula Junction rhythmites | 5.37 |
| 7 | Cummins Bridge rhythmites | 10.72 |
| 8 | Reese Coulee old flood | 12.44 |
| 9 | Gardena Cliffs Rhythmites | 16.06 |
| 10 | Smith Canyon Coulee | 9.48 |
| 11 | Lake Lewis Isles | 4.09 |
| 12 | Yakima Bluffs | 5.96 |
| 13 | Ancient Ice Age Flood Deposits | 5.74 |
| 14 | Red Mountain Peak | 4.83 |
| 15 | Badger Coulee | 0.84 |
| 16 | Kiona Quarry | 1.42 |
| 17 | Yakima River Badlands | 1.87 |
| 18 | Chandler Butte Landslide | 1.46 |
| 19 | Erratics & Bergmounds - Rattlesnake Slope | 11.32 |
| 20 | Rattlesnake Mountain / Lalik | 12.15 |
| 21 | Clastic Dike polygon network | 14.17 |
| 22 | Yakima Barricade Bergmounds | 24.17 |
| 23 | Cold Creek flood bar | 24.96 |
| 24 | Hanford Ranch National Monument | 8.52 |

Source: Horse Heaven Wind Farm, LLC 2021c
Notes: (a) As depicted in Figures 3.12-6 through 3.12-9
IAF-NGT= Ice Age Flood National Geologic Trail

The IAF-NGT feature nearest to the Lease Boundary is Badger Coulee, located approximately 0.84 miles north. The Badger Coulee feature is a 15-mile-long valley, a former course of the Yakima River before the Ice Age flood deposits. Other features near the Lease Boundary are the Kiona Quarry, Yakima River Badlands, Chandler Butte Landslide, and Pendant Flood Bar. The IAF-NGT secondary route of Interstate 82 bisects the eastern portion of the Lease Boundary.

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# 3.13 Public Health and Safety

This section describes existing public health and safety resources in the proposed Horse Heaven Wind Farm (Project, or Proposed Action) vicinity. This evaluation of public health and safety resources was prepared in alignment with Washington Administrative Code 463-60-352 and focuses on the availability of public service agencies and medical facilities (e.g., law enforcement, fire protection, and medical emergency services) within the vicinity of the Project Lease Boundary. Potential impacts on identified public health and safety resources are evaluated in Section 4.13.

## 3.13.1 Relevant Data Sources

The following sources were used in this evaluation of public health and safety resources:

- Horse Heaven Wind Farm Washington Energy Facility Site Evaluation Council Application for Site Certification (ASC) 2021 (Horse Heaven Wind Farm, LLC 2021)
- Benton County, Washington, Natural Hazard Mitigation Plan 2019 Revision (Northwest Management, Inc. 2019)
- Benton County, Washington, official website: https://www.co.benton.wa.us/default.aspx

## 3.13.2 Affected Environment

The Lease Boundary is located in Benton County, which is in southeastern Washington State. The Columbia River bounds Benton County to the north, east, and south, while Klickitat and Yakima Counties bound Benton County to the west. The county is predominantly rural and agricultural, with unincorporated areas making up most of the jurisdiction. The Lease Boundary lies south of the Tri-Cities—Kennewick, Pasco, and Richland, Washington. The Project would be situated on vacant land with dryland vegetation cover and few trees. Limited areas within the Lease Boundary contain historically recognized hazardous conditions, which have been cleaned up to the satisfaction of applicable agencies (see Appendix C of the ASC) and would be avoided during construction. The Williams Northwest Pipeline (an underground interstate gas transmission pipeline) traverses the Lease Boundary. Turbines and the solar array would be set back from this pipeline. At a minimum, Project elements would be located outside the pipeline right-of-way, which extends 55 feet to the east and 20 feet to the west of the pipeline. Construction of the Project would not impact the pipeline's operations. Underground collector lines and communications (supervisory control and data acquisition [SCADA]) for the Project would cross above the pipeline, and Horse Heaven Wind Farm, LLC (Applicant), would coordinate with Williams (the pipeline owner and operator) on construction specifications and would obtain their approval prior to crossing the pipeline.

The following sections describe the authorities or entities tasked with ensuring public health and safety in the Lease Boundary vicinity within Benton County.

### *3.13.2.1 Public Services*

### *Emergency Management Services*

Benton County Emergency Services is made up of two divisions: the Southeast Communications Center (SECOMM) and Benton County Emergency Management (BCEM). The two divisions assist emergency responders and promote community safety (Benton County n.d.).

- **SECOMM**: SECOMM's responsibilities include providing dispatch services to all law enforcement, fire and emergency management services, and emergency response agencies (including 9-1-1 response) within

Benton and Franklin Counties. SECOMM is the 9-1-1 dispatch center for the following emergency service agencies in the vicinity of the Lease Boundary:

- Kennewick Police and Fire
- Richland Police and Fire
- Pasco Police and Fire
- Benton County Sheriff's Office
- Benton County Fire Protection Districts 1, 2, 4, 5, and 6

- **BCEM**: The primary responsibility of BCEM is to minimize the impact of disasters on the people, property, economy, and environment of Benton County. BCEM's activities include comprehensive disaster planning, preparedness education, training, and resource coordination. In addition to hazards such as wildfires and floods, BCEM plans and prepares for emergencies at the Hanford decommissioned nuclear production site and the Columbia Generating Station.

### *Law Enforcement*

Law enforcement comprises the agencies and employees responsible for enforcing laws, maintaining public order, and managing public safety. The primary duties of law enforcement include the investigation, apprehension, and detention of individuals suspected of criminal offenses. The following state and local agencies have law enforcement service areas covering the Lease Boundary vicinity:

- **Benton County Sheriff's Office**: The Benton County Sheriff's Office Bureau of Law Enforcement is made up of 60 commissioned deputies and 10 non-commissioned employees. The Patrol Division consists of a Patrol Lieutenant overseeing 34 deputies and is responsible for providing an initial response to all requests for service received by the Sheriff's Office. The Patrol Division also performs the following:
  - Conducts the initial investigation of all reported crimes within the agency's jurisdiction
  - Conducts traffic enforcement and traffic accident investigations
  - Provides emergency response to assist with natural and human-caused disasters, often in conjunction with other area law enforcement and fire rescue agencies

The Detective Division handles all major crime investigations within the Sheriff's Office's jurisdiction and internal investigations into the conduct of the Sheriff's deputies. The Civil Division processes and serves court papers, and the Records Division processes the investigative reports prepared by the Patrol Division.

- **Kennewick Police Department**: The Kennewick Police Department has a Patrol Division with four 12-officer squads that provide professional law enforcement services to the community. These services include crimes in progress, investigations, traffic enforcement, and other emergency and non-emergency calls. The Criminal Investigation Division is responsible for investigating felony crimes and high-profile cases (including, but not limited to, homicides, assaults, armed robberies, arsons, burglaries, kidnappings, internet crimes, auto thefts, identity theft, and other felony crimes). The Administrative Services Division is responsible for employment (in conjunction with the City's Human Resources Department), training, internal affairs, and animal control authority, among other administrative services.

- **Washington State Patrol District 3:** District 3 comprises the seven southeastern counties of Washington State (including Yakima, Benton, and Franklin counties), covering over 900 miles of state and interstate highways, and shares borders with Oregon and Idaho. More than 140 employees are assigned, providing an array of law enforcement and investigation services. District 3 operates from four detachment offices across the state, the closest of which is in Kennewick.

### *Fire Protection*

The five incorporated communities and portions of the remaining unincorporated area of Benton County are served by municipal and rural fire departments. Richland and Kennewick municipal fire departments are operated by full-time fire personnel. Prosser, Benton City, and West Richland operate with full and part-time positions, along with volunteer staff. The unincorporated areas of Benton County are served by six fire districts that are primarily staffed by volunteer personnel.

The Lease Boundary primarily falls within the jurisdiction of Fire Districts #1 and #5.

- **Benton County Fire District #1**: Fire District #1 protects an area of approximately 320 square miles south of Kennewick, Richland, and West Richland and serves a population of approximately 17,500 residents, including the communities of Finley, South Kennewick, El Rancho Reata, and Badger Canyon. Through a Cooperative Agreement with the Bureau of Land Management (BLM) Spokane District, the Fire District also responds with fire suppression forces to 66,742 acres of BLM land in Benton, Franklin, and Yakima Counties. Within District #1 are residential areas, commercial and industrial complexes, educational facilities, agricultural areas, wildland areas, and zones of interfaces between urban and wildland/agriculture uses. District #1 has 13 career staff and 90 dedicated volunteer firefighters, officers, emergency medical technicians, first responders, and support personnel serving out of six fire stations. District #1 averages 1,350 calls for service each year, 55 percent of which are for emergency medical services and the remainder for fire. The potential for District #1 to experience a substantial wildland fire is high.
- **Benton County Fire District #5**: Benton County Fire District #5 covers an area of approximately 400 square miles and is primarily a wildland fire agency, with some urban/suburban interface with neighboring agencies. Fire District #5 also responds to vehicle accidents and provides some non-ambulance emergency medical services but relies on neighboring fire agencies for structure firefighting. District #5 operates out of four main stations with approximately 20 volunteers.

Both districts are part of the Tri-County Master Mutual Aid Agreement, including all fire departments and fire districts within Benton, Franklin, and Walla Walla Counties. Mutual aid agreements allow a jurisdiction to provide resources, facilities, services, and other required support to another jurisdiction during an incident (for example, Franklin County Fire District 3 responds to calls for wildland fires in Franklin County and across the Tri-Cities).

### *3.13.2.2 Health Services*

Benton County residents receive in-patient care at three general hospitals in Kennewick, Prosser, and Richland. The Lease Boundary vicinity falls within the jurisdiction of the Kennewick and Prosser Hospital Districts. A Hospital District directed by elected board members operates each of the Kennewick and Prosser hospitals.

- The Kennewick Hospital District provides healthcare services for its district or service area by contracting these services from RCCH Health Care Partners/Trios (RCCH). RCCH operates two hospitals and several related facilities in Kennewick. The two hospitals are the 74-bed Trios Southridge Hospital, which opened in 2014, and the older 37-bed Trios Women's and Children's Hospital. Classified as a Level III Adult Trauma

Center, Trios Southridge Hospital offers 24-hour emergency room services, seven days a week, with 27 emergency treatment rooms. Emergency departments are designated by the resources they have available to treat cases of traumatic injury. A Level III designation means that the department can provide prompt assessment, resuscitation, surgery, intensive care, and stabilization of injured patients.

- Prosser Memorial Hospital is a critical access hospital with 25 beds. Classified as a Level IV Adult Trauma Center, Prosser Memorial Hospital offers 24-hour emergency room services seven days a week. A Level IV designation means that the department can provide advanced life support measures to stabilize a trauma patient enough to be transported to another facility, if necessary. Prosser Memorial Hospital's emergency medical services team provides western Benton County with primary 911 emergency treatment and ambulance transportation to local area hospitals.
- Kadlec Regional Medical Center, located in Richland, is a regional medical center with 270 beds. Classified as a Level III Adult Trauma Center, the center offers 24-hour emergency room services seven days a week. The Richland hospital is a not-for-profit, private corporation governed by local volunteer trustees.

Benton County is also served by public and private medical clinics that provide treatment for most medical issues. In neighboring Franklin County, Lourdes Medical Center is a critical access hospital with 35 beds. Classified as a Level IV Adult Trauma Center, Lourdes Medical Center offers 24-hour emergency room services seven days a week.

# 3.14 Transportation

This section describes the traffic and transportation systems in the study area of the proposed Horse Heaven Wind Farm (Project, or Proposed Action). The study area for the transportation analysis includes roadway intersections, railroad mainlines, and marine terminal facilities in the vicinity of the Project, which is defined as approximately 4 miles south/southwest of the city of Kennewick, Washington, and the larger Tri-Cities urban area along the Columbia River. Conditions of transportation systems beyond the Washington border, including the conditions of Interstate 84, are not included in this assessment. Section 4.14 assesses impacts of the Project or No Action Alternative on transportation systems.

## *Regulatory Setting*

Washington Administrative Code 463-60-372 sections (1) through (6) require that an applicant provide information for site certification pertaining to:

- Transportation systems
- Vehicular traffic
- Waterborne, rail, and air traffic
- Parking
- Movement/circulation of people or goods
- Traffic hazards

## 3.14.1 Affected Environment

Washington is an economic gateway state, connecting Asian markets to U.S. industries, Alaska to the continental United States, and Canada to the U.S. West Coast. Imports to Washington support U.S. manufacturers and provide goods to consumers, while agricultural exports support family farms throughout the Pacific Northwest and Midwest. Goods coming into Washington by container ship often go to the Midwest and East Coast.

Regional economies in Washington—and their manufacturing, agriculture, construction, and forestry components—depend on an effective and efficient freight transportation system. Businesses in Washington rely on the freight system to ship their products to local customers in the state, U.S. markets in California and on the East Coast, and worldwide. Freight-dependent industries provide 46 percent of all jobs in Washington (WSDOT 2017). These jobs occur in the most heavily freight-dependent industry sectors such as wholesale and retail, manufacturing, construction, agriculture, and transportation. These sectors rely on the multimodal freight network to conduct day-to-day business.

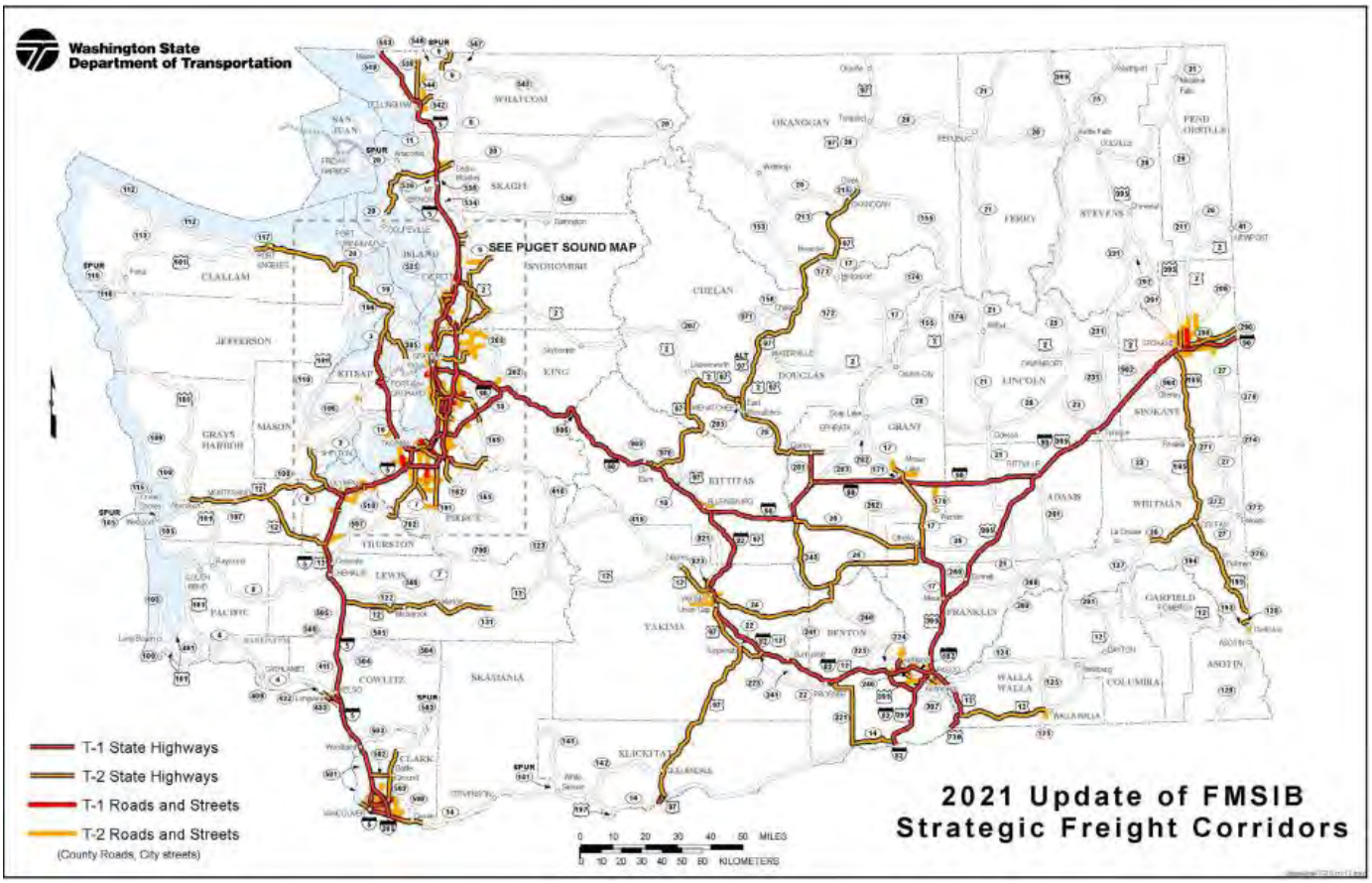
The 2021 Freight and Goods Transportation System (FGTS) classifies freight corridors by modes in Washington State based on annual freight tonnage moved, including truck, rail, and waterway freight corridors (WSDOT 2021a). Each modal network is classified into five tiers, and the specific annual tonnage thresholds for freight moved are described below:

- FGTS truck corridors are categorized as follows:
  - T-1 corridors: more than 10 million tons
  - T-2 corridors: 4 million to 10 million tons

- T-3 corridors: 300,000 to 4 million tons
- T-4 corridors: 100,000 to 300,000 tons
- T-5 corridors: at least 20,000 tons in 60 days and less than 100,000 tons per year

Both T-1 and T-2 corridors are shown in **Figure 3.14-1**.

- FGTS rail corridors are categorized as follows:
  - R-1 corridors: more than 5 million tons
  - R-2 corridors: 1 million to 5 million tons
  - R-3 corridors: 500,000 to 1 million tons
  - R-4 corridors: 100,000 to 500,000 tons
  - R-5 corridors: Less than 100,000 tons
- FGTS waterway corridors are categorized as follows:
  - W-1 corridors: more than 25 million tons
  - W-2 corridors: 10 million to 25 million tons
  - W-3 corridors: 5 million to 10 million tons
  - W-4 corridors: 2.5 million to 5 million tons
  - W-5 corridors: 0.9 million to 2.5 million tons




Source: WSDOT 2021b

**Figure 3.14-1: Statewide Map of 2021 T-1 and T-2 Truck Freight Corridors**

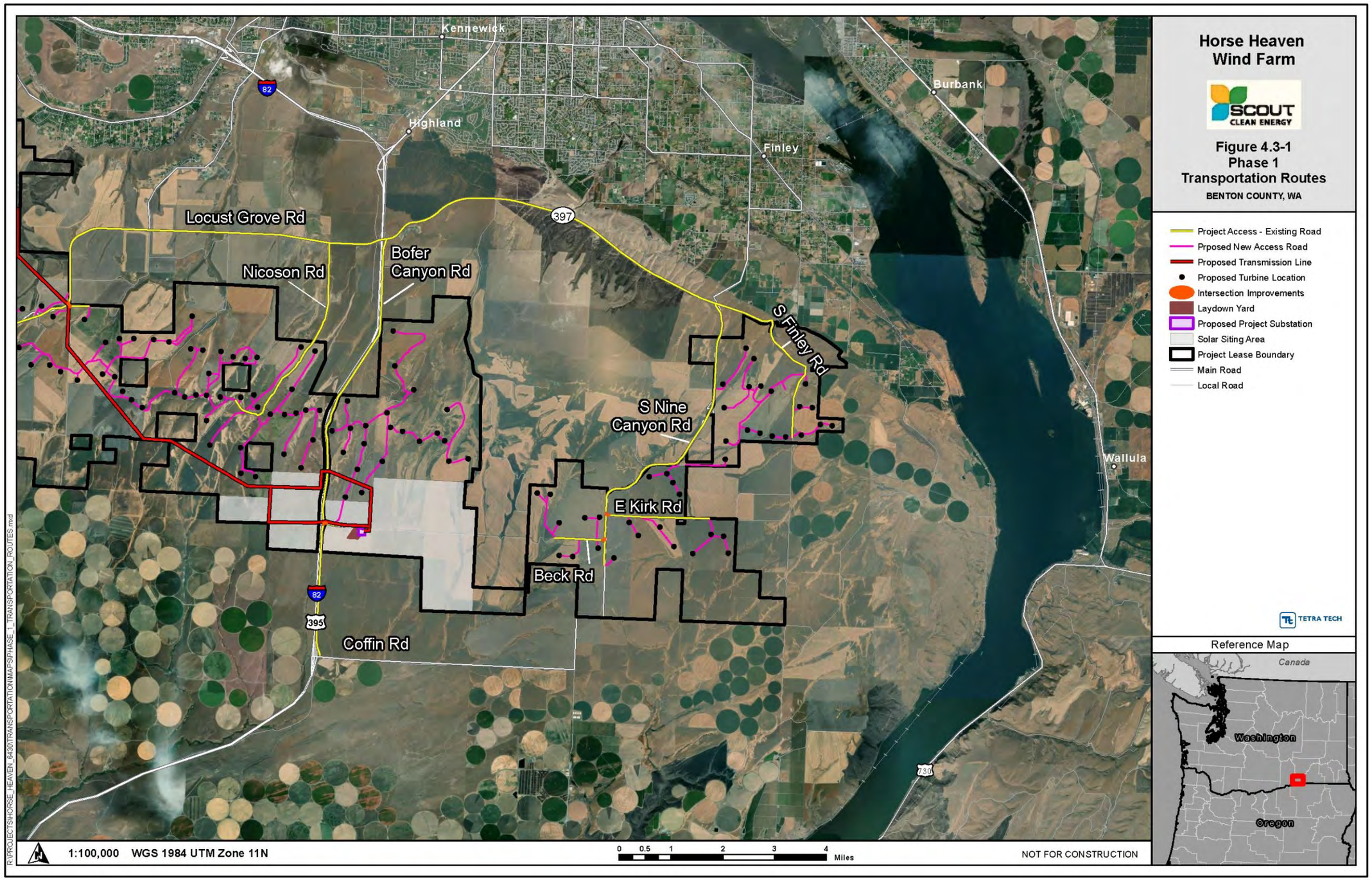
The Project would occupy two non-contiguous areas making up the Project's Lease Boundary, bisected by Interstate 82 (I-82), a T-1 Corridor. Each area would utilize a different set of local roads and constructed access roads for interior access; however, both areas would be served by I-82 as the primary inbound route for materials. All equipment is anticipated to be delivered from the south to the Project location during construction and decommissioning. From I-82, State Route 397—a T-3 Corridor—and county two-lane roads would be used to access the eastern portion of the Lease Boundary. From I-82, State Route 221—a T-2 corridor—and county roads would be used to access the western portion of the Lease Boundary.

Workers would arrive from multiple locations during construction, operation, and decommissioning. The Proposed Action in the context of the Applicant's example in the Application for Site Certification (ASC) is a phased approach to construction, described:

- Phase 1 construction could generate power via wind and solar. Phase 1 could also include a battery energy storage system (BESS) capable of storing energy.
- Phase 2 construction is divided into Phase 2a and Phase 2b, summarized as follows:
  - Phase 2a could consist of the construction of both wind and solar facilities. The Applicant's Phase 2a scenario also includes the construction of a BESS.

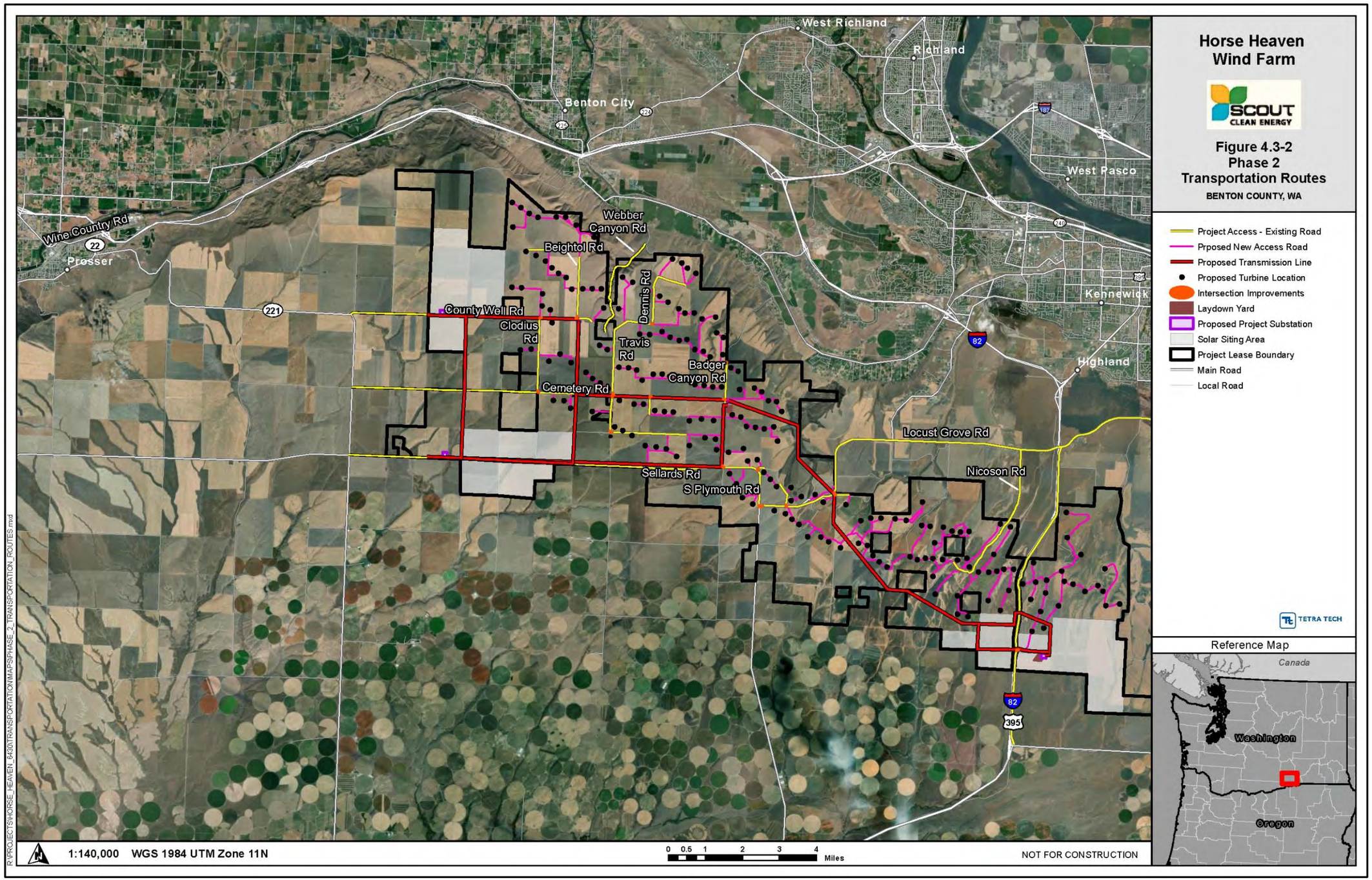
- Phase 2b could increase power generation via the construction of additional wind turbines, but construction would not include a BESS.

Possible transportation routes for the Project during construction are shown in **Figure 3.14-2 for Phase 1 and Figure 3.14-3 for Phase 2**.




Source: Horse Heaven Wind Farm, LLC 2021

**Figure 3.14-2: Transportation Routes for Phase 1**




Source: Horse Heaven Wind Farm, LLC 2021

**Figure 3.14-3: Transportation Routes for Phase 2**

The Project vicinity is utilized for agricultural activities. Most of the roads that would be utilized by the Project primarily serve local rural residents and the transport of agricultural produce. The agriculture and food manufacturing sector is a cornerstone of Washington's economy in both rural communities and metropolitan areas. The top four agricultural supply chains in Washington are apples, dairy, wheat, and potatoes, with all supply chains relying on corridors within the study area (WSDOT 2017).

#### *3.14.1.1 Local Infrastructure*

The Washington State Department of Transportation (WSDOT) is charged with planning, funding, implementing, constructing, and maintaining the multimodal transportation system in the state. WSDOT is responsible for managing and directing the state's freight and passenger rail capital and operating programs.

WSDOT establishes level of service (LOS) standards for state highways and ferry routes of statewide significance based on Revised Code of Washington (RCW) 47.06.140(2). LOS is a qualitative measure that predicts the quality of experience by motorists using the infrastructure. An LOS analysis evaluates the potential change to the LOS rating of roadways and intersections anticipated to be impacted by Project development. The LOS analysis provides a standardized means of categorizing efficiency and experiential quality by assigning a letter grade to it. LOS ratings range from A to F, with A representing the best conditions and F representing unacceptably high congestion and delays, as shown in **Table 3.14-1**. Regional transportation planning organizations and WSDOT jointly develop and establish LOS standards for regionally significant state highways and ferry routes based on RCW 47.80.030(1)(c).

**Table 3.14-1: Definition of Level of Service Ratings for Roadways**

| LOS | Description[(a)] | Signalized Intersection | Unsignalized Intersection | Highway/ Freeway | Volume-to-Capacity Ratio |
|---|---|---|---|---|---|
| | | Delay (s/veh) | | Density (pcpmpl) | |
| A | Free-flow | 0–10 | 0–10 | 0–11 | 0.00–0.60 |
| B | Reasonably free-flow | 10–20 | 10–15 | 11–18 | 0.61–0.70 |
| C | Stable flow | 20–35 | 15–25 | 18–26 | 0.71–0.80 |
| D | Approaching unstable flow | 35–55 | 25–35 | 26–35 | 0.81–0.90 |
| E | Unstable flow | 55–80 | 35–50 | 35–45 | 0.91–1.00 |
| F | Forced or breakdown flow | > 80 | > 50 | > 45 | > 1.00 |

Source: Horse Heaven Wind Farm, LLC 2021
Notes:
[(a)] Descriptions provided by the summary of data in WSDOT (2021c)
> = greater than; LOS = Level of Service; pcpmpl = passenger cars per mile per lane; s/veh = seconds per vehicle

Procedures based on the Transportation Research Board Highway Capacity Manual guidelines were used to complete an LOS analysis for roads impacted by Project development (TRB 2016). The LOS performance measure of an intersection is based on the delay that an average vehicle will experience after approaching the intersection. Unsignalized intersections include two-way and all-way stop-controlled intersections and roundabouts. Signalized intersections are those that have traffic signals/traffic lights. The LOS for highways and freeways is based on the density of the road in passenger cars per mile per lane. Roadways that are not highways/freeways are only analyzed at their intersections, as the intersections on those roads are the conflicting

zones where delay occurs. Grade-separated interchanges are analyzed as two independent unsignalized/ signalized intersections where the two exit ramps meet the cross street.

The State of Washington's Growth Management Act (RCW 36.70A.070) requires that cities and counties include a transportation element in their comprehensive plans. The transportation element of the Benton County Comprehensive Plan describes the existing transportation network, LOS, planned improvements and financing, and intergovernmental coordination needs, as required under RCW 36.70A.070(6), which helps integrate the transportation planning with land use (Benton County 2021a).

After adoption of the comprehensive plan, local jurisdictions must adopt and enforce ordinances that prohibit development approval if the development causes the LOS on a locally owned transportation facility to decline below the standards adopted in the transportation element of the comprehensive plan, unless transportation improvements or strategies to accommodate the impacts of development are made concurrently with the development. These strategies may include increased public transportation service, ride-sharing programs, demand management, and other transportation systems management strategies.

Benton County participates in the Benton-Franklin Regional Transportation Planning Organization and the Tri-Cities Metropolitan Planning Organization. RCW 36.81.121 requires the development of a perpetual, advanced, six-year transportation improvement program (TIP) for coordinated transportation that describes the road maintenance and improvement program. The 2022–2027 six-year TIP was approved on August 10, 2021 (Benton County 2021b). Transportation and roadway projects are identified to meet stated performance measures addressing safety, pavement, and bridges, as well as system performance, freight, and congestion mitigation. The planning area covered by these efforts includes the entirety of Benton County, including the study area for the Project.

Traffic data are only available for roadways in the area, and no new traffic counts were collected as part of the ASC for the Project. To analyze intersections, assumptions were made regarding turning movement counts based on the number of vehicles on the intersecting roads. Intersections that would be heavily utilized for Project construction and have appreciable background traffic volumes were analyzed for impacts.

The analysis did not include all intersections since not all intersections are utilized during the peak hour, the time required for the analysis. All calculations on outputs are based on the Highway Capacity Software (HCS7) package (Horse Heaven Wind Farm, LLC 2021).

All utilized roads and available traffic count data and jurisdictions are summarized in **Table 3.14-2**. The table also summarizes the physical characteristics and conditions for the local infrastructure. The conditional assessment is a qualitative judgment utilizing 2018 aerial imagery and does not represent a detailed characterization of quality based on in-person inspections of pavement or quantitative metrics such as asphalt/gravel depth, age, or design life.

**Table 3.14-2: Utilized Highway and County Roads and Future Forecasted Traffic Volumes**

| Access Road | Jurisdiction | Width (feet)[a] | LOS Standard[b]/ Speed Limit | Number of Lanes[c] | Peak Hour Average Traffic[d] | Current ADT[e] | Future ADT (10-Year Forecast)[f] | 2021 FGTS Class[g] | Condition/Notes[h] |
|---|---|---|---|---|---|---|---|---|---|
| I-82 | FHWA/WSDOT | 36/side | C/70 mph | 4 | 2,100 | 21,000 AADT (2019) | No data | T-1 | Fair; minor cracking especially on the shoulders; road may have been resurfaced because most cracking does not continue into road. |
| Coffin Road | Benton County | 30 | No data | 2 | 32 | 318 | 427 | No data | Fair; some minor cracking visible. |
| Bofer Canyon Road | Benton County | 32 | No data | 2 | No data | No data | No data | No data | Good; no cracking or wear visible, appears to have been redone between 2013 and 2015. |
| Nine Canyon Road | Benton County | 28 | No data | 2 | 63 | 630 | 847 | T-4 | Good; appears to have been paved between 2013 and 2015. |
| Beck Road | Benton County | 20 | No data | 1.5 | No data | No data | No data | T-5 | Poor; evidence of rutting all along gravel road. |
| Kirk Road | Benton County | 18 | No data | 1.5 | No data | No data | No data | No data | Good; rutting was repaired in 2016, gravel surface appears smooth. |
| State Route 397 | WSDOT | 36 | D/60 mph | 2 | 190 | 1,900 | No data | T-3 | Poor; plentiful filled cracks along the entire road. |
| S. Finley Road | Benton County | 24 | No data | 2 | 348 | 3,484 | 4,682 | T-4 | Good; appears to be repaved between 2015 and 2016. |
| State Route 221 | WSDOT | 32 | C/65 mph | 2 | 250 | 2,500 | No data | T-2 | Good; no visible wear or cracking. |
| Webber Canyon Road | Benton County | 32 | C/25 mph | 2 | 76 | 759 | 1,020 | T-3 | Good; provides connectivity to Benton City and appears well maintained. |
| Travis Road | Benton County | 28 | C/50 mph | 2 | 60 | 595 | 800 | T-3 | Good; a continuation of Webber Canyon Road. |
| Locust Grove Road | Benton County | 32 | No data | 2 | 36 | 362 | 486 | T-3 | Good; no obvious signs of wear and condition appears unchanged through the available imagery. |
| Nicoson Road | Benton County | 20 | No data | 2 | No data | No data | No data | No data | The first 4,600 feet is good condition paved, then it transitions to gravel/two-track road that is very narrow and may be a private road. |
| S. Plymouth Road | Benton County | 32 | C/50 mph | 2 | 67 | 659 | 886 | T-3 | Good; some very occasional minor cracking/wear. |
| Sellards Road | Benton County | 32 | C/50 mph | 2 | 71 | 713 | 958 | T-3 | Good; is a continuation of S. Plymouth Road. |
| Badger Canyon Road | Benton County | 18 | No data | 1.5 | 35 | 345 | 464 | No data | Good; no visible rutting or washout. |
| Cemetery Road | Benton County | 18 | No data | 1.5 | No data | No data | No data | No data | Fair; some evidence of worn tracks, though no apparent ruts. |
| Clodius Road | Benton County | 16 | No data | 1.5 | No data | No data | No data | No data | Fair; narrow and worn looking, but no obvious ruts. |
| County Well Road | Benton County | 20 | No data | 2 | 21 | 209 | 281 | T-3 | Good; probably very light use with no visible change in conditions throughout available imagery. |
| Beightol Road | Benton County | 16 | No data | 1.5 | No data | No data | No data | No data | Fair; narrow and worn looking. |
| Dennis Road | Benton County | 16 | No data | 1.5 | No data | No data | No data | No data | Fair; some washboarding visible. |

Source: Unless otherwise noted, Horse Heaven Wind Farm, LLC 2021 Tables 4.3-1 and 4.3-2

Notes:

[a] Width measured from aerial imagery is approximate edge of shoulder to edge of shoulder. For paved road only; the paved shoulder is included though most have additional gravel.

[b] LOS for state routes (including I-82, SR-307, and SR-221) is the existing standard set by WSDOT. This is the lowest acceptable rating for that road.

[c] The number of lanes is the total number of lanes counting both directions: 1.5 lanes indicates a road that is gravel as gravel roads do not have lane markings and usually have less width than a typical 2-lane paved road.

[d] Peak Hour Average Traffic is calculated as 10% of ADT per HCM guidelines; TRB 2016

[e] Current ADT data for Benton County roads is from 2015–2016; only county roads with LOS and ADT data are included. Current AADT data for I-82 are from the closest permanent traffic recorder (P-09).

[f] Future ADT for Benton County roads is forecast to either 2025 or 2026, depending on current ADT year and 10-year forecast uses a 3% yearly increase in ADT.

[g] WSDOT 2021a

[h] The conditional assessment is a qualitative judgment utilizing 2018 aerial imagery and does not represent a detailed characterization of quality based on in-person inspections of pavement or quantitative metrics such as asphalt/gravel depth, age, or design life Information will be verified by a third-party engineer during the required traffic analysis described in Section 4.14.2.4.

AADT = average annual daily traffic; ADT = average daily traffic; FGTS = Freight and Goods Transportation System; FHWA = Federal Highway Administration; HCM = Highway Capacity Manual; I-82 = Interstate 82; LOS = level of service; mph = miles per hour; SR = State Route; WSDOT = Washington State Department of Transportation

The LOS presented in **Table 3.14-3** is the prediction of the current functional quality of the local major intersections during the peak hour. Based on the available data for average daily traffic, shown in **Table 3.14-2**, the annual growth rate used in the forecast was approximately 3 percent for all roads (Horse Heaven Wind Farm, LLC 2021). Horse Heaven Wind Farm, LLC (Applicant) made assumptions for roads for which traffic data are not available based on engineer's experience, road connectivity, road size, road condition, and the number of homes or other destinations along the road. According to the ASC, existing traffic conditions are considered good. The intersections are below their capacities, and traffic flows freely throughout the Project vicinity.

**Table 3.14-3: Existing Conditions Level of Service**

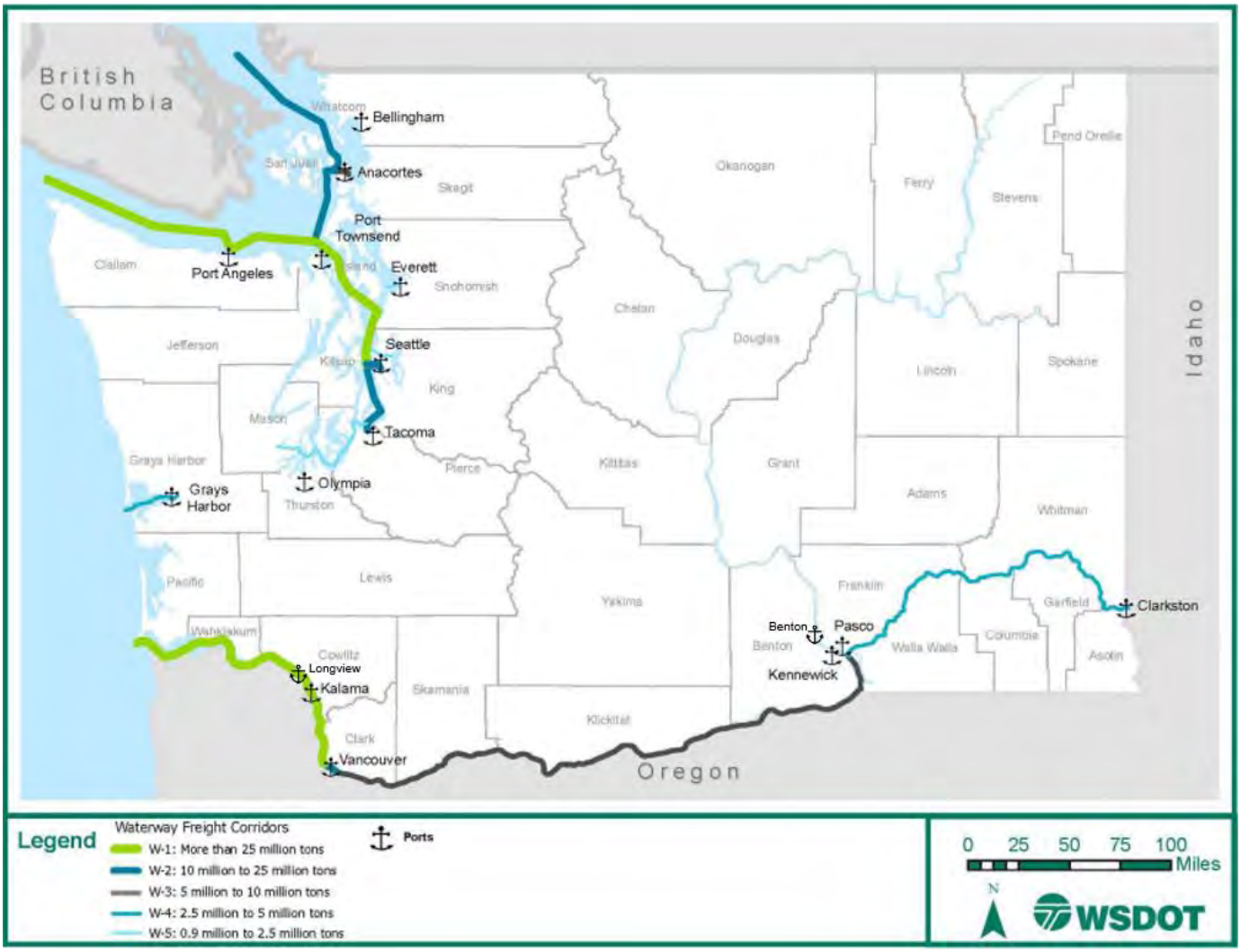
| Highway/Freeway | Density (pcpmpl) | LOS |
|---|---|---|
| I-82 | 10.9 | A |
| State Route 397 | 0.4 | A |
| State Route 221 | 0.5 | A |
| **Intersection** | **Delay (seconds)** | **LOS** |
| Route 397 and S. Nine Canyon Road | 11.4 | B |
| Bofer Canyon Road and Beck Road | 8.8 | A |
| I-82 N Ramp and Locust Grove Road | 10.1 | B |
| I-82 S Ramp and Locust Grove Road | 11.5 | B |
| Locust Grove Road and S Plymouth Road | 8.8 | A |
| Travis Road and Cemetery Road | 9.3 | A |
| Route 221 and Sellards Road | 12.9 | B |

Sources: WSDOT 2019, 2020; Horse Heaven Wind Farm, LLC 2021
Notes:
(a) LOS grades for highways/freeways and intersections are defined in **Table 3.14-2**.
I-82 = Interstate 82; LOS = level of service; pcpmpl = passenger cars per mile per lane

### *3.14.1.2 Waterborne, Rail, and Air Traffic*

### *Waterborne Traffic*

A total of 812 miles of waterways are identified as FGTS corridors. Of those, 751 miles were classified as W-1 (more than 25 million tons) through W-4 (2.5 million to 5 million tons) corridors and designated by the Washington State Freight Mobility Strategic Investment Board as part of the Strategic Freight Corridors. Waterways and ports are shown in **Figure 3.14-4**. Washington has the largest locally controlled port system in the world (Washington Ports n.d.). Public ports in Washington were authorized under the Port District Act of 1911. Each of Washington's 75 ports was formed by a vote of the residents and governed by publicly elected, local officials. Washington Port districts are unique, special-purpose districts with the primary mission of promoting economic development. Ports can build and operate commercial and general aviation airports, marine terminals, marinas, railroads, and industrial parks.




Source: WSDOT 2021a, with edits showing Port of Longview and Port of Benton

**Figure 3.14-4: Waterway Freight Corridors**

The Port of Benton, Port of Kennewick, and Port of Pasco on the Columbia River serve the area by water.

- The Port of Benton, established in 1958, was created following the transfer of ownership of Richland from the U.S. Army Corps of Engineers to the citizens in 1959. Previously, Richland had been the property of the federal government as part of a World War II secret mission called the Manhattan Project. The Port of Benton was designated as a Nuclear Port in 1965 by the U.S. Coast Guard and is one of only a handful of ports in the nation authorized to handle radioactive materials (Port of Benton n.d.).
- The Port of Kennewick provides mixed-use amenities and operates the Clover Island Marina for the launching and/or moorage of boats in Kennewick's Historic Waterfront District (Port of Kennewick 2019).
- The Port of Pasco is considered the largest public marine terminal on the upper Columbia River. The Port of Pasco was originally formed to provide facilities for barge shipments of grain from the area on the Columbia River to the seacoast terminals. The Port of Pasco has a 600-acre industrial center with several miles of railroad tracks and streets and over 1.7 million square feet of buildings. The Port of Pasco also took over the

former World War II U.S. Navy facility, known as the Pasco Airport, and renamed it the Tri-Cities Airport (Port of Pasco 2022).

The Port of Longview, Port of Kalama, and Port of Vancouver are the closest seaports to the Lease Boundary.

- The Port of Longview offers bulk cargo handling and has eight marine terminals and waterfront industrial property spanning 835 acres on the Columbia River, 66 miles from the Pacific Ocean in southwest Washington State (Port of Longview n.d.). Cargo handling at the Port of Longview includes all types of bulk cargo and breakbulk commodities such as fertilizers, grain, heavy-lift cargo, logs, lumber, minerals, paper, pulp, steel, and wind energy components (Port of Longview n.d.).
- The Port of Kalama sits on the Columbia River immediately west of Interstate 5. The Port of Kalama is a marine terminal port that offers 5 miles of riverfront industrial acreage and is served by the Burlington Northern/Santa Fe and Union Pacific railroads (Port of Kalama 2022).
- The Port of Vancouver connects Asia and South America to the U.S. midcontinent and Canada and handles more than 7 million tons of cargo each year, including wheat, mineral and liquid bulks, vehicles, and other project cargo (Port of Vancouver USA 2022).

### *Rail Traffic*

Rail is an integral part of Washington's statewide transportation system. Railroads carry a variety of products, including agricultural products, energy products, forest products, chemicals, containerized goods, finished automobiles, and waste products (WSDOT 2020).

Several freight stations are within the Project's study area, including (USDOT n.d.):

- Hedges (Freight Station Accounting Code [FSAC] 07427)
- Kennewick (FSAC 07430 and FSAC 13004)
- Hover (FSAC 12147)
- Finley (FSAC 12151)
- Cushman (FSAC 12153)
- Yellepit (FSAC 12159)
- Plymouth (FSAC 12183)
- Vista (FSAC 13007)
- Badger (FSAC 13017)
- Kiona (FSAC 13024)
- Gibbon (FSAC 13034)
- Prosser (FSAC 13040)
- Whitstran (FSAC 5003)


Source: WSDOT 2021a

**Figure 3.14-5: Rail Freight Corridors in Washington State**

Planning and investment in the state's rail system is guided by WSDOT's vision for a safe, sustainable, and integrated multimodal transportation system. The State Rail Plan is consistent with the Transportation System Policy Goals adopted by the state legislature and with statewide and metropolitan planning. Burlington Northern-Santa Fe, Union Pacific Railroad, and Tri City and Olympia Railroad Company provide commercial rail service to the area. Amtrak provides passenger rail service to the area. Freight and passenger services share much of the same infrastructure and operate as an integrated rail system (WSDOT 2020). WSDOT sponsors Amtrak Cascades intercity passenger rail service in conjunction with the Oregon Department of Transportation.

The LOS grades and descriptions for rail correspond generally to the LOS grades used in the Federal Highway Administration's Highway Performance Monitoring System. The capacity analysis results are expressed as LOS grades by comparing combined freight and passenger train volume to the practical capacities of each segment. The volume/capacity ratios and the corresponding LOS grades are listed in **Table 3.14-4**.

**Table 3.14-4: Definition of Level of Service Grades for Rail**

| LOS Grade | WSDOT Definition | Volume/Capacity Ratio |
|---|---|---|
| **A** | Below Capacity - Low to moderate train flows with capacity to accommodate maintenance and recover from incidents | 0.0 to 0.2 |
| **B** | Below Capacity - Low to moderate train flows with capacity to accommodate maintenance and recover from incidents | 0.2 to 0.4 |
| **C** | Below Capacity - Low to moderate train flows with capacity to accommodate maintenance and recover from incidents | 0.4 to 0.7 |
| **D** | Near Capacity - Heavy train flow with moderate capacity to accommodate maintenance and recover from incidents | 0.7 to 0.8 |
| **E** | At Capacity - Very heavy train flow with limited capacity to accommodate maintenance and recover from incidents | 0.8 to 1.0 |
| **F** | Above Capacity - Unstable flows; service breakdown conditions | >1.00 |

Source: WSDOT 2020
LOS = level of service; WSDOT = Washington State Department of Transportation

Three future scenarios were evaluated by WSDOT for system capacity analysis in 2019:

- Low growth scenario: combines the low growth scenario established for freight rail volume forecast, and for Cascades rail ridership forecast
- Moderate growth scenario: combines the corresponding moderate scenarios established for freight rail volume forecast and for Cascades passenger rail ridership forecast
- High growth scenario: combines the corresponding high growth scenarios established for freight rail volume forecast and for Cascades passenger rail ridership forecast

These three scenarios included existing long-distance and commuter services for capacity analysis but did not account for additional Amtrak long-distance trains or Sounder commuter rail trains.

The results of the LOS analysis are summarized in **Table 3.14-5**.

**Table 3.14-5: Rail Level of Service Estimation for Base and Forecast Year Scenarios**

| Name of Corridor | 2019 State Rail Plan Update LOS[(a)] | | | |
|---|---|---|---|---|
| | 2016 Base Year | 2040 Low Growth | 2040 Moderate Growth | 2040 High Growth |
| Auburn-Pasco | B | A | B | B |
| Everett-Vancouver, B.C., Canada | C | C | E | F |
| Hinkle, OR-Lakeside | C | B | E | F |
| Pasco-Lakeside | C | C | E | F |
| Vancouver-Pasco | E | D | F | F |
| Seattle-Tacoma (BNSF) | C | C | D | E |
| Seattle-Tacoma (UP) | A | A | B | B |
| Tacoma-Vancouver (BNSF/UP Shared Use Segment) | C | C | E | F |
| Seattle-Everett | C | C | E | F |
| Everett-Spokane | C | C | F | F |
| Lakeside-Spokane (BNSF/UP Shared Use Segment) | E | D | F | F |
| Spokane-Sandpoint, ID (BNSF) | C | C | F | F |
| Spokane-Sandpoint, ID (UP) | C | B | E | F |
| Portland, OR-Vancouver (BNSF/UP Shared Use Segment) | B | C | C | E |
| Fallbridge-Chemult, OR | A | A | A | A |

Source: WSDOT 2020
Notes:
(a) LOS grades for rail are defined in **Table 3.14-4**.
B.C. = British Columbia; BNSF = Burlington Northern-Santa Fe; ID = Idaho; LOS = level of service; OR = Oregon; UP = Union Pacific

This analysis provides an indication of current and future demands for capacity and resulting congestion, absent any operational change and investments to increase capacity. The capacity analysis results identified multiple segments where capacity would be insufficient to handle Project-related traffic without changes.

### *Air Traffic*

The Tri-Cities Airport and the smaller airports, Port of Benton Airport and Richland Airport, serve the area surrounding the Lease Boundary. The Tri-Cities Airport, which is associated with the Port of Pasco, is the largest airport in the southeastern Washington/northeastern Oregon region, with connections to 11 major hubs (Port of Pasco 2022). Both the Port of Benton Airport and the Richland Airport were acquired by the Port of Benton in 1961. The Port of Benton Airport, formerly the Prosser Airport or the George O. Beardsley Field, was transferred by the City of Prosser to the Port of Benton, and the federal government transferred the Richland Airport, formerly the Atomic Energy Field, to the Port of Benton (Port of Benton n.d.).

### *3.14.1.3 Parking*

The Project Lease Boundary is located in rural agricultural land with no major existing public parking facilities. Parking along roads within the Lease Boundary occurs for two recreational opportunities—the Horse Heaven Hill Cemetery and Johnson Butte.

#### *3.14.1.4 Movement/Circulation of People or Goods*

State and interstate highways are designed and constructed to handle legal loads of 105,500 pounds (gross weight). Some trucks that deliver large and heavy equipment (typically the base, lower middle, and top tower sections, nacelles, drive train, and hub) would be required to obtain oversize/overweight permits. These permits allow travel on all unrestricted roads. I-82 and State Route 397 are constructed to standards that will safely allow legally oversized/overweight trucks to pass with no adverse impact on the road surface. None of the state roads currently have size or weight restrictions. The condition of the existing Benton County roads that would be used by the Project varies from improved gravel two-lane roads to two-track roads with minimal aggregate surfacing.

#### *3.14.1.5 Traffic Hazards*

Existing traffic hazards consist of current truck transport (including hazardous materials, such as fuel), agricultural equipment, and vehicle accidents. Approximately 66 collisions occurred from January 1, 2020, through January 31, 2021, that resulted in an injury in the study area, including several that occurred within the Lease Boundary (County of Benton n.d.). Three fatalities were reported in the study area in 2021 (County of Benton n.d.). Work zone traffic control, or maintenance of traffic, can be used to decrease fatalities related to the transportation of oversized materials for the construction of projects.

The primary function of work zone traffic control is to allow all modes of traffic, including motor vehicles, bicyclists, and pedestrians, to move safely and easily through or around work areas while still allowing safe and efficient work operations to be conducted. Effective temporary traffic control enhances traffic safety and efficiency. The Federal Highway Administration's Manual on Uniform Traffic Control Devices is adopted by WSDOT as the legal standard. Traffic Control Plans are used for projects to communicate work duration, personal protective wear requirements, traffic control devices and equipment, required flagging, and other special considerations, including other roadway users or traffic concerns such as school zones and/or rail crossings.

Speed zones (limits) are established based on the concept of reasonable speed. Roads with no posted speed are subject to the Basic Speed Rule. Under Washington State law, the maximum speed limit in urban areas is 50 miles per hour (mph). All other speed limits are called "prima facie limits," which are considered by law to be safe and prudent under normal conditions. Certain prima facie limits are established by state law and include 25 mph in business and residential districts and 20 mph in school zones.

The following schools and school zones are located in the study area:

- Cottonwood Elementary near East Badger Road
- Prosser Heights Elementary near State Route 22
- Housel Middle School near State Route 22
- Prosser High School near State Route 22
- Keene Riverview Elementary near State Route 22

School zones are areas near marked crosswalks installed adjacent to school grounds. Washington State Law RCW 46.61.440, in regard to driving speed in a designated school zone, specifies "Speed 20 miles per hour when children are present." This reduced speed is in effect 24 hours per day, not just during crossing hours. In some cases, the school crossing area may have speed beacons (flashers). At these crossings, the 20 mph school zone is in effect any time these beacons are flashing (Kennewick Washington n.d.).

### *Rail Safety*

The Washington Utilities and Transportation Commission (UTC) is the state agency responsible for regulating railroad safety in Washington. The UTC's Rail Safety program protects the public and railroad employees by ensuring that railroad companies meet established state and federal safety standards and by educating the public about the dangers of traveling on or near railroad tracks.

The UTC inspects railroad crossings in the state every three years and railroad crossings located on crude oil routes every 18 months, monitors railroad grade crossing inventory information, and documents trespassing and incident data.

The UTC, through Title 49, Code of Federal Regulations Part 212, is the designated state agency that partners with the Federal Railroad Administration (FRA) to inspect rail shipments of hazardous materials. There are more than 300 inspection points throughout the state, including shippers' facilities, railroad yards, and terminals. In addition to these hazardous materials inspections, the UTC's FRA-certified inspectors perform inspections on signal and train control equipment, track, motive power and equipment, railroad operating practices, and grade crossings.

In addition, the UTC has regulatory authority over safety at public highway-rail grade crossings. The UTC monitors all accidents and incidents at public and private crossings, including investigating fatalities and injuries. Private crossings are those that cross the tracks into residential driveways or service roads, or on industrial properties and along railroad rights-of-way.

The UTC funds projects to improve public safety at crossings and to limit pedestrian access to railroad rights-of-way through the Grade Crossing Protection Fund. The UTC also partners with Operation Lifesaver, Inc., and coordinates activities with Washington Operation Lifesaver, a public service education program dedicated to preventing collisions, injuries, and fatalities on and around railroad tracks and highway-rail grade crossings.

The UTC recorded 33 accidents and incidents at Washington State grade crossings in 2021. One of these occurred in Benton County (UTC 2022).

Crossings that are in the vicinity of the Project and could intersect the assumed transport routes of materials for the Project include:

- Crossing 927487A, where train tracks cross over Webber Canyon Road
- Crossing 928191E, where train tracks cross under I-82 near West Clearwater Avenue
- Crossing 928192L. where train tracks cross Dallas Road at grade
- Crossing 966466M, where train tracks cross under eastbound I-82 near the Lewis and Clark Trail Highway
- Crossing 966467U, where train tracks cross under westbound I-82 near the Lewis and Clark Trail Highway

All crossings except Crossing 928192L are located above (overpass) or under (underpass) the transport route. Crossing 928192L, where train tracks cross Dallas Road is a grade crossing, meaning that the crossing occurs at the same grade as other traffic. Two BNSF trains use this crossing each 24-hour period, at a maximum speed of 40 miles per hour. UTC has recorded two accidents at this crossing, one occurring in 1992 and the other in 2008. In both cases, the vehicle driver did not heed the warning signals at the crossing. Neither accident resulted in an injury or fatality. The crossing is equipped with automatic crossing signals and gates, which means when a train is

approaching, the gates go down to block access to the track until the train passes through. To circumvent the gates, a driver must be fully aware of the downed gates and consciously choose to drive around the gates and over the tracks.

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# 3.15 Public Services and Utilities

This section describes the public utilities and the regulatory setting in the proposed Horse Heaven Wind Farm (Project, or Proposed Action) and Project vicinity. Public services such as law enforcement, fire protection, emergency management services, and hospitals are discussed in Section 3.13, Public Health and Safety. Similarly, schools are discussed as part of Section 3.16, Socioeconomics. The Project vicinity includes the areas 4 miles south/southwest of the City of Kennewick, Washington, and the larger Tri-Cities urban area along the Columbia River. A public utility is an organization that maintains the infrastructure for a public service. A reduction in the reliability of a public utility service affects all areas of daily life. Section 4.15 discusses the Project's anticipated impact on the availability of public services and utilities within the Project vicinity and Benton County.

Utilities, as described in the Benton County Comprehensive Plan, include the following:

- Supply, treatment, and distribution of domestic and irrigation water
- Collection and treatment of sewage
- Collection and conveyance of stormwater
- Supply and distribution of natural gas
- Supply and distribution of electricity
- Telecommunications, including broadband internet services, cable television (TV), and microwave transmissions
- Collection and disposal of solid waste
- Construction, operation, and maintenance of streets (Benton County 2021)

Sections 3.4 and 4.4, Water Resources, analyze the collection and conveyance of stormwater within the Lease Boundary and Project vicinity. Sections 3.7 and 4.7, Energy and Natural Resources, evaluate the supply and demand for electricity and water within the Project vicinity, Benton County, and the State of Washington. Sections 3.14 and 4.14, Transportation, evaluate the Project's impact on streets.

## *Regulatory Setting*

Washington Administrative Code (WAC) 463-60-535(4) requires a review of a proposed facility's impact on utilities. The primary regulatory agency for most utilities in the State of Washington is the Washington Utilities and Transportation Commission (UTC). The UTC ensures that safe and reliable service is provided to customers at reasonable rates. The State of Washington's Growth Management Act (Revised Code of Washington [RCW] 36.70A.070) requires that cities and counties include a utilities element in their comprehensive plans that describes the general location, proposed location, and capacity of all existing and proposed utilities, including, but not limited to, electrical lines, telecommunication lines, and natural gas lines. The relevant goals and policies of the Benton County Comprehensive Plan's utilities element (UE) include the following:

- UE Goal 1: Ensure utilities support the land use and economic development goals of the County.
- UE Goal 2: Maintain public and private household water and sewer systems that are consistent with the rural character of the County.

- UE Goal 3: Facilitate efficiency in utility land use and development.
  - Policy 2: Encourage multiple uses, including passive recreational use, in utility corridors where practical.
  - Policy 3: Facilitate maintenance and rehabilitation of existing utility systems and facilities and encourage the use of existing transmission/distribution corridors (Benton County 2021).

## 3.15.1 Affected Environment

Benton County is predominantly rural and agricultural in nature, with unincorporated areas making up most of the county's territory. Benton County consists of several unincorporated communities, as well as the incorporated cities of Benton City, Kennewick, Prosser, Richland, and West Richland. The county is bordered on the west by Klickitat and Yakima Counties, on the north by Grant County, on the east by Franklin and Walla Walla Counties, and on the south by Umatilla County, Oregon. The county is located at the confluence of three rivers: the Columbia, Yakima, and Snake Rivers. The Yakima River runs through the middle of the county, to its confluence with the Columbia River in Richland.

### *Domestic and Irrigation Water*

All water systems within the State of Washington are regulated by the Washington State Department of Health, Office of Drinking Water. While more than 85 percent of the state's population gets their drinking water from public water systems, 15 percent obtain their water from domestic supplies.

A domestic use is a water supply used for domestic purposes, as defined by WAC 173-518-030. Typically, a domestic water supply comes from a well that is exempt from permitting under RCW 90.44.050 and the Washington State Department of Health's public water system requirements. The use and development of a surface water or spring for a domestic water supply typically require water right permitting from the Washington State Department of Ecology.

Irrigation districts in the State of Washington are created under RCW 87.03. The irrigation districts of Roza, Sunnyside Valley, Benton, Kennewick, Kiona, Columbia, and Badger Mountain serve Benton County (Benton County 2021). The City of Kennewick's Municipal Water System obtains water from the Kennewick and Columbia Irrigation Districts (City of Kennewick 2017). The Lease Boundary is not located within any of the seven irrigation districts; however, the Kennewick Irrigation District is located just north of the Lease Boundary.

### *Wastewater*

The State of Washington, in accordance with WAC 246-272A, requires that all wastewater receive treatment to protect human health and aquatic life. Although the State of Washington has more than 600 wastewater treatment plants, most rural residents in Benton County rely on on-site septic tanks and drain fields for their wastewater system needs. The Benton-Franklin Health District is responsible for permitting, overseeing the design and installation of, and inspecting small on-site septic systems with wastewater flows of less than 3,500 gallons per day (Benton-Franklin Health District 2021). For large on-site sewage systems with design flows above 3,500 gallons per day, WAC 246-272B requires the operator to obtain approval from the Washington State Department of Health.

### *Water and Stormwater*

Except for the Cities of Kennewick and Richland, the source of the water supply for Benton County and its municipalities is groundwater. In addition to withdrawing groundwater as their primary source of water, the Cities of Kennewick and Richland withdraw water from the Columbia River to assist in meeting their communities'

demands. There are no public water supply wells located within the Lease Boundary. Sections 3.4 and 4.4, Water Resources, evaluate groundwater and stormwater resources within the Lease Boundary and Project vicinity.

Sections 3.7 and 4.7, Energy and Natural Resources, evaluate the supply and demand for water. As discussed in Section 3.7, the Application for Site Certification indicates that the Project would be supplied with water through a haul agreement with a private vendor (Horse Heaven Wind Farm, LLC 2021). The Applicant's water source documentation states that the vendor would likely acquire the water from the Kennewick Utility Services Division of Public Works. This division is responsible for the city's water treatment plant, wastewater treatment plant, wastewater collection, and water distribution programs.

### *Natural Gas*

Cascade Natural Gas Corporation builds, operates, and maintains natural gas facilities serving Benton County. Cascade Natural Gas is an investor-owned utility serving customers in 16 counties in Washington State. The Pacific Northwest receives its natural gas from the southwest United States and Canada. Natural gas is supplied to the entire region via two interstate pipeline systems. The Northwest Pipeline Corporation owns and operates the network that supplies natural gas to Benton County. Natural gas is stored in a facility in Plymouth. A network of small-diameter distribution mains and service lines transports the gas to end-users (Benton County 2021). Sections 3.7 and 4.7, Energy and Natural Resources, evaluate the supply and demand for energy.

### *Electricity*

The Bonneville Power Administration (BPA) is an agency of the U.S. Department of Energy. It wholesales electric power produced at 29 federal dams located in the Columbia-Snake River Basin, and one non-federal nuclear plant. Electricity is purchased from the BPA and supplied to areas in Benton County by either the Benton County Public Utility District (Benton PUD) or the Benton Rural Electric Association (Benton REA). The Lease Boundary includes areas that fall under the management of the Benton PUD and Benton REA. The service areas of each provider are as follows:

- **Benton PUD**: The Benton PUD's service area is entirely within Benton County and includes the cities of Kennewick, Benton City, Prosser, and portions of West Richland. The Benton PUD serves Benton County except for the City of Richland, the U.S. Department of Energy's operations on the Hanford Reservation, and rural areas of the county that are served by the Benton REA (Benton County 2021).
- **Benton REA**: The Benton REA is a consumer-owned rural cooperative that serves portions of Benton, Lewis, and Yakima Counties. The Benton REA's 1,300-square-mile territory extends from the Columbia River at Paterson, north to the Hanford Reservation, and west to White Pass in the Cascade Mountains. The Benton REA serves the rural areas of Benton County and some urban areas (Benton County 2021).

Sections 3.7 and 4.7, Energy and Natural Resources evaluate the supply and demand for electricity within the Lease Boundary and Benton County.

### *Telecommunications and Cable Television*

Several companies supply local, long-distance, and cellular telecommunications services in Benton County (Benton County 2021). Spectrum is the primary cable internet service provider in Benton County and is available to approximately 91 percent of its residents. In addition to Spectrum, several additional TV and internet service providers provide cable TV and internet access to the county's homes and businesses.

## *Solid Waste*

Solid waste landfills in the State of Washington are regulated by local health departments and the Department of Ecology through the Criteria for Municipal Solid Waste Landfills Chapter 173-351 WAC. Within Benton County, the UTC, Benton County, and municipalities regulate solid waste collection. The Benton County solid waste program is managed by the Benton County Road Department and run in accordance with the Benton County Solid Waste Plan and Moderate Risk Waste Plan 2013 Update and with the advice of the Benton County Solid Waste Advisory Committee. Representatives from each of the cities in Benton County, the Washington State Department of Ecology, the Benton-Franklin Health District, and local refuse and recycling companies make up the Benton County Solid Waste Advisory Committee.

The generation of solid waste within Benton County and the cities of Benton City, Kennewick, Prosser, Richland, and West Richland is managed in alignment with the Benton County Solid Waste and Moderate Risk Waste Plan 2013 Update (Benton County 2014). The plan is intended to provide citizens and decision makers in Benton County with a guide to implement, monitor, and evaluate future activities related to solid waste for a 20-year period. As shown in **Table 3.15-1**, the county and its incorporated municipalities generated 263,603 tons of solid waste in 2010.

**Table 3.15-1: Benton County Solid Waste Projections**

| Year | 2010 (Actual) | 2025 (Projected) | 2030 (Projected) | 2032 (Projected) |
|---|---|---|---|---|
| Waste Generated (tons) | 263,603 | 326,505 | 346,517 | 350,206 |

Source: Benton County 2014

By 2032, Benton County anticipates that it may need to dispose of approximately 86,500 more tons of solid waste annually than in 2010. Benton County attributes the additional solid waste to projected population growth (Benton County 2014).

Columbia Ridge Landfill in Arlington, Oregon, receives most of the waste disposed of by Benton County. Other major landfills used for disposal of waste from Benton County include Horn Rapids Landfill in the City of Richland and Finley Buttes Regional Landfill in Morrow County, Oregon (Benton County 2014).

The following describes each of the three landfills that local vendors use for permanent solid waste disposal:

- **Columbia Ridge Landfill**: Columbia Ridge Landfill and Green Energy Plant (Columbia Ridge) provides disposal services for communities, businesses, and industries, primarily from Oregon and Washington. Columbia Ridge is a modern Subtitle D landfill that accepts primarily municipal solid waste (MSW) and industrial and special wastes. Columbia Ridge is permitted by the Oregon Department of Environmental Quality (DEQ) and is in full compliance with DEQ rules and regulations. Columbia Ridge Landfill was opened in 1990 and has a life expectancy of approximately 143 years and a permitted remaining capacity of 329 million tons. The landfill's recycling services include electronic waste and white goods. The landfill does not accept appliances, batteries, discarded vehicles, hazardous wastes, loose sharps, tires, or used oil (Waste Management 2019).
- **Horn Rapids Landfill**: Horn Rapids Landfill is owned and operated by the City of Richland Public Works Department. The landfill began receiving waste in 1974 and receives municipal garbage and yard waste. Horn Rapids Landfill receives the following waste streams as part of its waste disposal program: used motor oil (5-

gallon limit per visit), antifreeze, cooking oil, automotive batteries, rechargeable batteries, and propane tanks and canisters. The landfill has an existing permitted footprint of 46 acres (City of Richland, Washington 2017).

- **Finley Buttes Landfill**: Finley Buttes Landfill is a modern MSW disposal facility permitted by the DEQ and is in full compliance with DEQ rules and regulations. The site accepts MSW, construction and demolition wastes, and special wastes (including liquids) with proper approval. The landfill does not accept old paints, chemicals, and cleaning supplies. The landfill began operations in 1991 and receives over 500,000 tons of MSW annually. Finley Buttes Landfill is 1,800 acres and is the second largest landfill in Oregon. As of 2015, its estimated available fill capacity was approximately 132 million tons of MSW. Currently, the site receives around 500,000 tons of MSW each year. The permitted life span of the landfill is approximately 300 years (Clark County, Washington 2015).

Currently, there are four certified waste haulers operating in Benton County. Solid waste collection in unincorporated Benton County is provided under certificates granted by the UTC. The following describes the four waste haulers whose service areas intersect the Lease Boundary and their waste transportation procedures:

- **Basin Disposal, Inc. (BDI)**: This waste hauler serves eastern Benton County. BDI first transports waste to the BDI transfer station in Pasco, Washington, and then hauls the waste to Finley Buttes Landfill in Boardman, Oregon, for disposal.
- **Ed's Disposal, Inc.**: This waste hauler serves central Benton County. Like BDI, Ed's Disposal, Inc., first transports waste to the BDI transfer station in Pasco and then hauls the waste to Finley Buttes Landfill in Boardman, Oregon, for disposal.
- **Sanitary Disposal, Inc.**: Sanitary Disposal, Inc., serves southwestern Benton County. Waste collected by Sanitary Disposal is transported to a transfer station in Umatilla County, Oregon, prior to disposal at Finley Buttes Landfill.
- **Waste Management of Kennewick (Waste Management)**: Waste Management serves areas throughout unincorporated Benton County. Waste collected by Waste Management is transported to its transfer station in Kennewick and then hauled to Columbia Ridge Landfill in Arlington, Oregon, for disposal (Benton County 2014).

### *Recycling Options*

Within Benton County, Ray Poland and Sons, Inc. receives recyclable construction debris and waste including asphalt, wire mesh, concrete, and concrete with rebar (Benton County n.d.). Waste Management accepts recyclable paper, plastic bottles, and metal cans and containers at their waste transfer station at 2627 S. Ely Street, Kennewick, Washington. E-Cycle Washington is a free program that makes it easy for Washington residents to recycle their broken, obsolete, or worn-out electronics. The following locations in Benton County participate in the E-Cycle Washington program and guarantee free recycling:

- Clayton Ward Recycling Center, 119 Albany Ave, Kennewick
- Clayton Ward Recycling Center, 1936 Saint St, Richland
- Goodwill Donation Centers

LightRecycle Washington is a program that accepts compact fluorescent light bulbs, as well as fluorescent tubes and high intensity discharge lights. The following locations within Benton County participate in the LightRecycle Washington program:

- Ace Hardware & Sporting Goods, 2831 W Kennewick Ave, Kennewick
- Batteries Plus Bulbs, 321 N Columbia Center Blvd, Kennewick
- Ace Hardware & Sporting Goods, 103 Keene Road, Richland
- Grigg's Department Store Ace Hardware, 1415 George Washington Way, Richland
- Patnode's True Value, 600 9th St, Benton City (City of Richland, Washington 2022)

### *Streets*

The roadway transportation system in Benton County consists of interstate highways, state highways, collectors, and local access routes. Benton County's principal road concerns in rural areas are "all weather" access for agricultural product transport and more direct "farm to market" routes for agricultural products. As noted, Sections 3.14 and 4.14, Transportation, evaluate the Project's impact on streets.

# 3.16 Socioeconomics

This section describes existing socioeconomic conditions in the proposed Horse Heaven Wind Farm (Project or Proposed Action) vicinity. The Project vicinity includes the areas 4 miles south/southwest of the City of Kennewick, Washington, and the larger Tri-Cities urban area along the Columbia River. This evaluation of socioeconomics was prepared in alignment with Washington Administrative Code (WAC) 463-60-535 and describes existing demographics, labor market and economic conditions, and public services related to socioeconomic conditions within the study area (defined below). Section 4.16 provides an evaluation of potential impacts of the Proposed Action and the No Action Alternative on socioeconomics.

Sections 3.13 and 4.13, Public Health and Safety, focus on the availability of public service agencies and medical facilities (e.g., law enforcement, fire protection, and medical emergency services) within the vicinity of the Lease Boundary. Sections 3.15 and 4.15, Public Services and Utilities, focus on utilities that serve the Project vicinity.

## *Regulatory Setting*

WAC 463-60-535 states that an Application for Site Certification:

> *…shall include a detailed socioeconomic impact analysis which identifies primary, secondary, positive as well as negative impacts on the socioeconomic environment in the area potentially affected by the project, with particular attention to the impact of the proposed facility on population, work force, property values, housing, health facilities and services, education facilities, governmental services, and local economy.*

WAC 463-60-535 requires that an evaluation of socioeconomics include the area that employment related to a proposed action may affect within a 1-hour commute distance of the project site. WAC 463-60-535 states that an analysis of socioeconomics shall use the most recent data as published by the U.S. Census Bureau or State of Washington sources. The study area for socioeconomics, therefore, includes the area within the Lease Boundary and the populations of Benton, Franklin, Walla Walla, and Yakima Counties. Although the Oregon counties of Morrow and Umatilla are within a 1-hour commute of the Lease Boundary, this discussion of socioeconomics focuses solely on populations governed under the State of Washington's constitution.

WAC 197-11-448 identifies general welfare, social, and economic standing as conditions that contribute to an area's quality of life. WAC 197-11-448 states that agencies have the option to combine a review of socioeconomics with the preparation of an environmental impact statement.

In 2021, the State of Washington legislature passed Revised Code of Washington (RCW) 70A.02 to reduce environmental and health disparities in the state and improve the health of all Washington State residents. RWC 70A.02 codified the state's approach to environmental justice (EJ) into law. The code requires that all covered agencies comply with all provisions of the statute, while all other state agencies should strive to apply the laws of the State of Washington, and the rules and policies of the agency, in accordance with the policies of RWC 70A.02, to the extent feasible.

The State of Washington's Growth Management Act (GMA) is a series of state statutes that require counties and cities whose population growth exceeds stated thresholds to develop a comprehensive plan that assists in managing their population growth. Due to the impact of population growth on housing affordability and availability

and economic conditions, the following are additional provisions associated with the GMA under Chapter 36.70A RCW that are applicable to a review of socioeconomics:

- RCW 36.70A.010 states that the legislature finds that uncoordinated and unplanned growth, together with a lack of common goals expressing the public's interest in the conservation and the wise use of Washington's lands, pose a threat to the environment; sustainable economic development; and the health, safety, and high quality of life enjoyed by the State of Washington's residents.
- RCW 36.70A.010 states that it is in the public interest that citizens, communities, local governments, and the private sector cooperate and coordinate with one another in comprehensive land use planning.
- RCW 36.70A.010 states that it is in the public interest that economic development programs be shared with communities experiencing insufficient economic growth.
- RCW 36.70A 115 states that counties and cities that are required or choose to plan under RCW 36.70A.040 shall ensure that, taken collectively, adoption of and amendments to their comprehensive plans and/or development regulations provide sufficient capacity of land suitable for development within their jurisdictions to accommodate their allocated housing and employment growth, including the accommodation of, as appropriate, the medical, governmental, educational, institutional, commercial, and industrial facilities related to such growth, as adopted in the applicable countywide planning policies and consistent with the 20-year population forecast from the Washington State Office of Financial Management (OFM).
- RCW 43.62.030 states that the OFM shall annually determine the populations of all cities and towns of the state as of April 1. State agencies should use OFM population estimates for cities and towns in state program administration and in the allocation of selected state revenues.

The U.S. Environmental Protection Agency (EPA) defines EJ as the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (EPA 2016).

The EPA defines the term "fair treatment" to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies." The term "disproportionate impacts" refer to differences in impacts or risks that are extensive enough that they may merit action. (EPA 2016)

In accordance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, each federal agency "shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The Executive Order makes clear that its provisions apply fully to programs involving Native Americans" (CEQ 1997). According to RCW 70A.02.010, EJ means:

> "*The fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. This includes using an intersectional lens to address disproportionate environmental and health impacts by prioritizing highly impacted populations, equitably distributing resources and benefits, and eliminating harm" (RCW 70A02).*

### *Background*

The Benton-Franklin Council of Governments (BFCOG) administers the Benton-Franklin Economic Development District (BFEDD). The BFCOG is the regional economic planning agency for Benton and Franklin Counties. Since 2014, the Benton and Franklin County region has experienced an increase in both population and economic growth. According to the BFEDD, economic growth measured by increases in employment opportunities through local businesses within the region grew by 2.1 percent per year between 2013 and 2019. This expansion in local employment contributed to the region's increase in gross domestic product of 3.5 percent per year since 2013 (BFCOG 2021).

Benton and Franklin Counties also contain the Kennewick-Richland Metropolitan Statistical Area (MSA). MSAs consist of integrated geographic regions typically made up of an urbanized economic core and economically related counties (U.S. Census Bureau 2020a). The U.S. Office of Management and Budget delineates MSAs according to published standards that are applied to U.S. Census Bureau data.

The general concept of an MSA is that of a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core. The Tri-Cities of Kennewick, Pasco, and Richland are the core of the Kennewick-Richland MSA. Benton and Franklin are economically related counties that share a high degree of economic integration with the urbanized core and one another.

## 3.16.1 Affected Environment

Benton County is in southeastern Washington State. The Columbia River bounds Benton County to the north, east, and south, while Klickitat and Yakima Counties bound Benton County to the west. Benton County is predominantly rural and agricultural in nature, with unincorporated areas making up most of the jurisdiction. The Project's Lease Boundary is south of the Tri-Cities. Kennewick and Richland are located within Benton County, while Pasco is located in Franklin County.

As previously noted, WAC 463-60-535 states that the study area for socioeconomic impacts shall include the area that may be affected by employment within a 1-hour commute distance of the project site. In addition to Benton and Franklin Counties, Walla Walla and Yakima Counties in Washington are also within a 1-hour commute of the Lease Boundary.

### *3.16.1.1 Population and Growth Rate*

Increases in population can occur from either net in-migration or natural increase. Net in-migration occurs when more people move to an area than leave. Natural increase occurs when there are more births than deaths (OFM 2022a). The State of Washington's approximate population is 7,766,975 (OFM 2022b). Since 2010, the State of Washington's population has been growing at an average of over 100,000 persons per year. Between 2011 and 2021, in-migration accounted for 66 percent of Washington's population growth. Correspondingly, natural increases in population growth accounted for the remaining 34 percent. The OFM's projections for the state's population suggest that the pace of growth is likely to increase over the ensuing decades.

As shown in **Table 3.16-1**, Benton County had an estimated population of 209,400 as of 2021. This ranks Benton County as the 10th most populated county in the State of Washington (OFM 2022b).

**Table 3.16-1: Population (Postcensal Estimates) and Growth Management Act Mid-Level Growth Rate Projections**

| Location | 2011 Population | 2021 Population | Average Annual Growth Rate (2011–2021) | 2030 Projection | 2040 Projection | 2050 Projection |
|---|---|---|---|---|---|---|
| **Benton County** | 177,900 | 209,400 | 17.7 % | 228,162 | 250,524 | 267,139 |
| Benton City | 3,145 | 3,500 | 11.3 % | Not Available | Not Available | Not Available |
| Kennewick | 74,665 | 84,620 | 13.3 % | Not Available | Not Available | Not Available |
| Prosser | 5,780 | 6,130 | 6.1 % | Not Available | Not Available | Not Available |
| Richland | 49,090 | 61,320 | 24.9 % | Not Available | Not Available | Not Available |
| West Richland | 12,200 | 17,070 | 39.9 % | Not Available | Not Available | Not Available |
| **Franklin County** | 80,500 | 98,350 | 22.2 % | 127,443 | 158,574 | 182,589 |
| Connell | 5,150 | 5,125 | -0.48 % | Not Available | Not Available | Not Available |
| Kahlotus | 190 | 145 | -23.7 % | Not Available | Not Available | Not Available |
| Mesa | 495 | 390 | -21.2 % | Not Available | Not Available | Not Available |
| Pasco | 61,000 | 78,700 | 29.0 % | Not Available | Not Available | Not Available |
| **Walla Walla County** | 58,800 | 62,100 | 5.6 % | 59,036 | 58,963 | 58,573 |
| **Yakima County** | 244,700 | 258,100 | 5.5 % | 246,914 | 252,912 | 258,007 |
| **State of Washington** | 6,767,900 | 7,766,975 | 14.7 % | 8,503,178 | 9,242,022 | 9,855,117 |

Sources: OFM n.d.(b), n.d.(c)
Note: Postcensal data for each calendar year between the census and the current year are updated annually using information on the components of population change.

An estimated 82 percent of Benton County's population lives in one of five incorporated communities. Of the county's incorporated communities, Kennewick has the largest population, with 84,620 residents. Kennewick's population accounts for approximately 40 percent of the county's total population. Richland is the second largest incorporated community within Benton County with a total population of 61,320 residents (OFM n.d.[b]). Benton County had an average population density of 123.17 persons per square mile in 2021. Benton County's population density is greater than the statewide average of 116.88 persons per square mile (OFM n.d.[d]).

Benton County's total population increased by 31,500 people or 17.7 percent between 2011 and 2021. Benton County's increase in population exceeded the state average of approximately 14.7 percent (OFM n.d.[e]). When compared to the state's population growth, migration played a slightly smaller role in Benton County's increase. In-migration accounted for approximately 63 percent of the county's growth in population over this period. Natural increase accounted for the remaining 37 percent (OFM n.d.[e]).

In 2021, Franklin County's estimated population was 98,350. Pasco is the largest incorporated community in Franklin County, with a population of 78,700. Franklin County had an average population density of 79.21 persons per square mile in 2021, compared to a statewide average of 116.88 persons per square mile (OFM n.d.[b], n.d.[d]). The total population in Franklin County increased by more than 17,850 people, or 22 percent, between

2011 and 2021. Franklin County's population growth rate exceeded the state's average of 14.7 percent over the same period. Natural increase accounted for more than 65 percent of Franklin County's population growth, with net in-migration making up the remaining 35 percent (OFM n.d.[e]).

In 2021, the populations of Walla Walla and Yakima Counties were 62,100 and 258,100, respectively. The largest incorporated community in Walla Walla County is the City of Walla Walla, with a 2021 population of 33,680. The largest incorporated community in Yakima County is the City of Yakima, with a population of 97,810. The population density for Walla Walla County in 2021 was 48.90 persons per square mile, while the population density of Yakima County was 60.10 persons per square mile. The population densities of Walla Walla and Yakima Counties are approximately half the statewide average of 116.88 persons per square mile (OFM n.d.[b], n.d.[d]).

### *Population Projections*

The OFM prepares county population projections for planning under Washington State's GMA. The OFM prepares high-, medium-, and low-growth expectations for each county, with the medium series considered the most likely because it is based on assumptions that have been validated with past and current information. Current projections developed in support of the GMA extend through 2040, with supplemental projections developed from 2040 through 2050. **Table 3.16-1** presents projection data based on the OFM's medium growth scenario.

From 2021 to 2030, the populations of Benton and Franklin Counties are projected to increase by approximately 9 percent and 30 percent, respectively. These percentages indicate that Benton County's percent increase in population would be similar to that of the State of Washington's (9 percent) over the same nine-year period. As noted, Franklin County is projected to experience a much higher percent growth rate than either Benton County or the State of Washington over the same nine-year period (OFM n.d.[e]).

As shown in **Table 3.16-1**, the OFM has projected population growth for Benton and Franklin Counties as far out as 2050. The projected 17 percent increase in population for Benton County during the 20-year period between 2030 and 2050 is anticipated to be slightly higher than the State of Washington's 15 percent increase over the same period. Franklin County's 43 percent increase in population from 2030 to 2050 is expected to be almost three times the percent increase that Washington is projected to experience over the same period (OFM n.d.[e]).

From 2021 to 2030, population is projected to increase by approximately 6 percent and 5 percent in Walla Walla and Yakima Counties, respectively. The projected growth rates for Walla Walla and Yakima Counties suggest a slower increase in population for these counties than expected for the State of Washington or Benton and Franklin Counties over the same nine-year period. For the 20-year period from 2030 to 2050, the OFM has projected that the population of Walla Walla County would decrease by less than 1 percent. Over the same 20-year period, Yakima County's population is expected to increase by 4 percent. Both percent changes in population would be far less than the 15 percent increase in population that the OFM has projected for the State of Washington as a whole (OFM n.d.[e]).

## *3.16.1.2 People of Color Populations*

The White House Council on Environmental Quality (CEQ) guidance states that "minority populations should be identified where either: a) the minority population of the affected area exceeds 50 percent; or b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis" (CEQ 1997).

The selection of the appropriate unit of geographic analysis may be a governing body's jurisdiction, a neighborhood, a census tract, or other similar unit chosen so as to not artificially dilute or inflate the affected minority population (CEQ 1997).

**Table 3.16-2** presents race and ethnicity data from the U.S. Census Bureau's 2020 Decennial (every 10 years) Census of Population and Housing for the study area. According to the most recent census estimates, approximately 64 percent of the population of Washington State is white. Persons of Hispanic or Latino origin were identified as the single largest people of color group, accounting for 14 percent of the state's total population. In Benton County, 66 percent of the population identified themselves as white alone, while approximately 24 percent of Benton County's population identified themselves as Hispanic alone. The percentage of Benton County's population that identifies themselves as Hispanic alone is higher than the statewide average of 14 percent (U.S. Census Bureau 2021a).

**Table 3.16-2: Breakdown by Race and Ethnicity by City and County (2020 Decennial Census) for the Project Study Area**

| Location | Total Population for Whom Race Status Is Determined | White Alone (%) | Hispanic Alone (%) | Other Races (%) | All People of Color (Hispanic and Other Races) (%) |
|---|---|---|---|---|---|
| **Benton County** | 206,873 | 66 | 24 | 6 | 29 |
| Benton City | 3,479 | 59 | 35 | 3 | 37 |
| Kennewick | 83,921 | 59 | 30 | 6 | 36 |
| Prosser | 6,062 | 47 | 46 | 4 | 50 |
| Richland | 60,560 | 73 | 13 | 8 | 21 |
| West Richland | 16,295 | 77 | 14 | 4 | 18 |
| **Franklin County** | 96,749 | 38 | 54 | 5 | 59 |
| Connell | 5,441 | 43 | 41 | 12 | 53 |
| Kahlotus | 147 | 73 | 18 | 1 | 20 |
| Mesa | 385 | 19 | 76 | 2 | 78 |
| Pasco | 77,108 | 35 | 58 | 4 | 62 |
| **Walla Walla County** | 62,584 | 68 | 23 | 4 | 27 |
| **Yakima County** | 256,728 | 40 | 51 | 6 | 57 |
| **State of Washington** | 7,705,281 | 64 | 14 | 16 | 30 |

Source: U.S. Census Bureau 2021a
Note:
Total population percentages may not equal 100 percent due to rounding.

Six census block groups intersect with or are located adjacent to the Project Lease Boundary (**Figure 3.16-1**). A census block group is a statistical subdivision of a census tract, generally defined to contain between 600 and 3,000 people and 240 and 1,200 housing units (U.S. Census Bureau 2021b). **Table 3.16-3** and **Figure 3.16-1** present race and ethnicity data for the six census block groups that intersect with or are adjacent to the Lease Boundary.

**Table 3.16-3: Race and Ethnicity of Census Block Groups Intersecting the Project Lease Boundary**

| Lease Boundary | Total Population for Whom Race States Is Determined | White Alone | White Alone (%) | Hispanic Alone | Hispanic Alone (%) | Other Races Alone | Other Races (%) | All People of Color (Hispanic and other Races) | All People of Color (Hispanic and Other Races) (%) |
|---|---|---|---|---|---|---|---|---|---|
| Census Tract 108.07, Block Group 1 | 1,558 | 1,194 | 77 | 232 | 15 | 63 | 4 | 295 | 19 |
| Census Tract 108.14, Block Group 1 | 5,129 | 4,286 | 84 | 406 | 8 | 194 | 4 | 600 | 12 |
| Census Tract 115.01, Block Group 1 | 1,392 | 966 | 69 | 344 | 25 | 28 | 2 | 372 | 27 |
| Census Tract 115.06, Block Group 1 | 2,161 | 1,755 | 81 | 171 | 8 | 132 | 6 | 303 | 14 |
| Census Tract 116, Block Group 1 | 835 | 442 | 53 | 366 | 44 | 11 | 1 | 377 | **45** |
| Census Tract 118.01, Block Group 3 | 898 | 705 | 79 | 133 | 15 | 25 | 3 | 158 | 18 |
| **Block Group Totals** | 11,973 | 9,348 | 78 | 1,652 | 14 | 453 | 4 | 2,105 | 18 |
| **Benton County** | 206,873 | 135,718 | 66 | 49,339 | 24 | 11,641 | 6 | 60,980 | 29[(a)] |

Source: 2020 Decennial Census (U.S. Census Bureau 2021a)
Note:
[(a)] Reference threshold for the analysis of people of color
Total percent population may not be equal to 100 percent due to rounding.
Bold values = Percentage of people of color that are greater than reference threshold

When comparing the percentage of people of color who reside in Benton County (29 percent) to the percentage of people of color who reside in other counties within the socioeconomic study area (**Table 3.16-2**), the percentage of people of color population within the Benton County (29 percent) is considered a conservative reference threshold for people of color analysis within the identified six census block groups that intersect with or are adjacent to the Lease Area.

White alone represents the majority population in all six census block groups. The percentage of white residents ranges from 53 to 84 percent within the six block groups. For most of the block groups (four out of six block groups), people of color range between 8 and 15 percent for the Hispanic population. Percent for other races range between 1 and 6 percent for all census block groups. The percentage of people of color for the six census block groups combined (18 percent) is well below the identified threshold for this analysis (29 percent). However, the people of color population in Census Tract 116, Block Group 1 (45 percent) is greater than this value for Benton County as a whole (29 percent), which is the identified reference community in this study.

Census Tract 116, Block Group 1, spans a very large area, with the majority falling outside the Project Lease Boundary. This census block group is among the least populated of the census block groups, but it is the largest census block group that intersects with the Project Lease Boundary. Review of arial imagery indicated that this block group contains little built-up development, and proximity values to other EJ indicators, such as superfund, traffic, and hazardous waste, are low in this area (**Appendix 3.16-1**) (EJ Screen 2022).

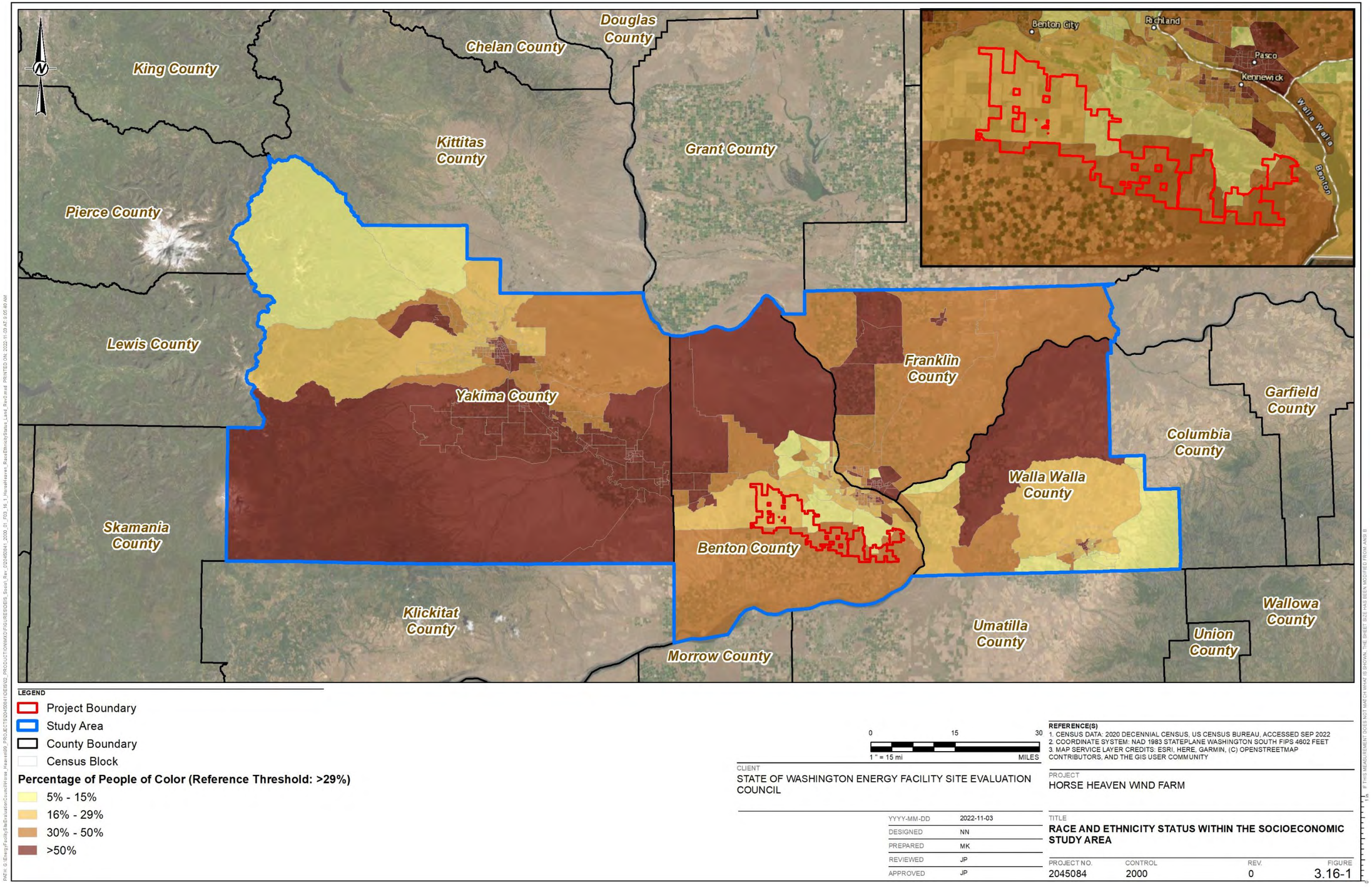


**Figure 3.16-1: Race and Ethnicity Status**

### *3.16.1.3 Low-income Population*

According to the CEQ, a community that has a significant amount of its population living at or below the poverty level could be considered a low-income community (CEQ 1997). RCW 19.405.020 defines low-income as follows:

> *Household incomes as defined by the department or commission, provided that the definition may not exceed the higher of eighty percent of area median household income or two hundred percent of the federal poverty level, adjusted for household size.*

In accordance with RCW 19.405.020, this analysis defines low-income as individuals who make less than 200 percent of the federal poverty level, adjusted for household size.

**Table 3.16-4** shows income and poverty data for the Project's socioeconomic study area. The estimated share of total households below the poverty level in Washington State is 11 percent. Poverty levels were slightly higher in Benton County (12 percent) and Franklin County (15 percent). Similarly, the estimated shares of total households below the poverty level were 13 percent in Walla Walla County and 17 percent in Yakima County. In Benton County, the share of households below the poverty level in its five incorporated communities ranged from about 8 percent in West Richland to 18 percent in Prosser. In Franklin County, the share of households below the poverty level in its four incorporated communities ranged from about 9 percent in Kahlotus to 29 percent in Mesa (U.S. Census Bureau 2020b).

**Table 3.16-4: Household Income Level within the Project Study Area**

| Geographic Area | Median Household Income | Mean Household Income |
|---|---|---|
| **Benton County** | $69,023 | $87,525 |
| Benton City | $55,175 | $64,786 |
| Kennewick | $59,533 | $74,073 |
| Prosser | $50,164 | $57,745 |
| Richland | $77,686 | $99,631 |
| West Richland | $99,817 | $108,641 |
| **Franklin County** | $63,584 | $79,145 |
| Connell | $51,154 | $55,688 |
| Kahlotus | $51,250 | $54,681 |
| Mesa | $50,000 | $61,620 |
| Pasco | $62,775 | $77,031 |
| **Walla Walla County** | $57,858 | $76,351 |
| **Yakima County** | $51,637 | $69,036 |
| **State of Washington** | $73,775 | $98,983 |

Note: Adjusted for inflation in 2019 dollars
Source: U.S Census Bureau American Community Survey 5-year estimate (U.S. Census Bureau 2020b)

As shown in **Table 3.16-4**, median incomes were below the state average in Benton, Franklin, Walla Walla, and Yakima Counties. This was also the case for the incorporated communities of Benton and Franklin Counties, with the exceptions of Richland and West Richland, Washington.

**Table 3.16-5** presents the low-income data for the Project's socioeconomic study area. In comparison to the State of Washington, the low-income level in the study area was the highest in Yakima County (6 percent of low-income population in the State of Washington), followed by Benton County (3 percent of low-income population in the

State of Washington). This value for the study area (Benton, Franklin, Walla Walla, and Yakima Counties together) is 11.62 percent, indicating that the low-income population within the study area represents 11.62 percent of the low-income population within the State of Washington.

**Table 3.16-5: Low-income Status Within the Project Study Area**

| Lease Boundary | Total Population for Whom Income Status Is Determined | Low-income Population (All Individuals with Income below the Poverty Ratios – 200 Percent) | Percentage of low-income Population (Comparison to Total Population) (%) | Comparison of All Individuals with Income Below the Poverty Ratios – 200 Percent and this Value for the State of Washington (%) |
|---|---|---|---|---|
| **Benton County** | 198,731 | 52,180 | 26 | 3 |
| **Franklin County** | 90,828 | 30,749 | 34 | 1.7 |
| **Walla Walla County** | 55,803 | 17,142 | 31 | 1 |
| **Yakima County** | 246,943 | 106,806 | 43 | 6 |
| **Benton, Franklin, Walla Walla, and Yakima Counties combined** | 592,305 | 206,877 | 35 | 11.62 |
| **State of Washington** | 7,372,433 | 1,780,174 | 24 | - |

Source: U.S. Census Bureau, American Community Survey, Table S1701, Poverty Status in the past 12 months, 2020 (U.S. Census Bureau 2020b)

Because of the location of the Project, and the fact that Benton County has the lowest percentage of low-income individuals in comparison to other counties within the Project study area, Benton County was selected as the most conservative reference community, and therefore the percentage of low-income individuals in Benton County (26 percent) was used as the conservative reference threshold for the analysis of low-income status in this study.

**Table 3.16-6** and **Figure 3.16-2** present low-income data for the census block groups that intersect with or are adjacent to the Project Lease Boundary. The total population of low-income individuals within the studied census block groups (1,721) constitutes 3.3 percent of the total population of low-income individuals within Benton County as a whole (52,180), while the total population for whom income status is determined within the studied census block groups (12,637) constitutes 6.3 percent of the total population within Benton County (198,731).

**Table 3.16-6: Low-income status of Census Block Groups Intersecting the Project Lease Boundary**

| Geographic Area | Total Population for Whom Income Status is Determined | Low-income Population (All Individuals with Income Below the Poverty Ratios – 200 Percent) | Percentage of low-income Population (Comparison to Total Population) (%) | Percent of Low-income Population (Comparison to Benton County Low-income Population) (%) |
|---|---|---|---|---|
| Census Tract 108.07, Block Group 1 | 1772 | 330 | 19 | 0.63 |
| Census Tract 108.14, Block Group 1 | 5,250 | 414 | 8 | 0.8 |
| Census Tract 115.01, Block Group 1 | 1,077 | 446 | **41** | 0.85 |
| Census Tract 115.06, Block Group 1 | 2,736 | 51 | 2 | 0.1 |
| Census Tract 116, Block Group 1 | 977 | 224 | 23 | 0.43 |
| Census Tract 118.01, Block Group 3 | 825 | 256 | **31** | 0.49 |
| **Census Block Groups Totals** | 12,637 | 1,721 | 14 | 3.3 |
| **Benton County** | 198,731 | 52,180 | 26[(a)] | - |
| **State of Washington** | 7,372,433 | 1,780,174 | 24 | - |

Source: U.S. Census Bureau, America Community Survey, Table S1701, Poverty Status in the past 12 months, 2020 (U.S. Census Bureau 2020b)
Note:
[(a)] = Reference threshold for the analysis of low-income communities
Bold = Percentage of low-income communities that is greater than the reference threshold.

While the percentage of low-income population for the six census block groups combined (14 percent) is well below the identified low-income threshold for this analysis (26 percent), Census Tract 115.01, Block Group 1 and Census Tract 118.01, Block Group 3 with 41 percent and 31 percent of low-income population, respectively, supersede the low-income threshold (26 percent) and are identified as low-income communities.

Census Tract 115.01, Block Group 1, with low-income population of 41 percent, is the only census block group (among the six) that is completely outside the Project Lease Boundary but is located adjacent to the Project Lease Boundary. This census block group is also among the least populated block groups (1,077 individuals for whom income status is determined). Review of aerial imagery indicated a low amount of built-up development and dispersed housing in the majority of the areas within this census block group. Proximity values to other EJ indicators, such as superfund, traffic, and hazardous waste are low for this census block group (**Appendix 3.16-1**) (EJ Screen 2022).

Similarly, while Census Tract 118.01, Block Group 3, with low-income population of 31 percent, is the second largest census block group (after Census Tract 116, Block Group 1) that intersects with the Project Lease Boundary, compared to other block groups it has the lowest population of individuals for whom income status is determined. Large portions of this census block group are located outside the Project Lease Boundary. Review of

the imagery indicated a very low amount of built-up areas and dispersed housing in this census block group. Also, proximity values to other EJ indicators, such as superfund, traffic, and hazardous waste are low for this census block group (**Appendix 3.16-1**) (EJ Screen 2022).

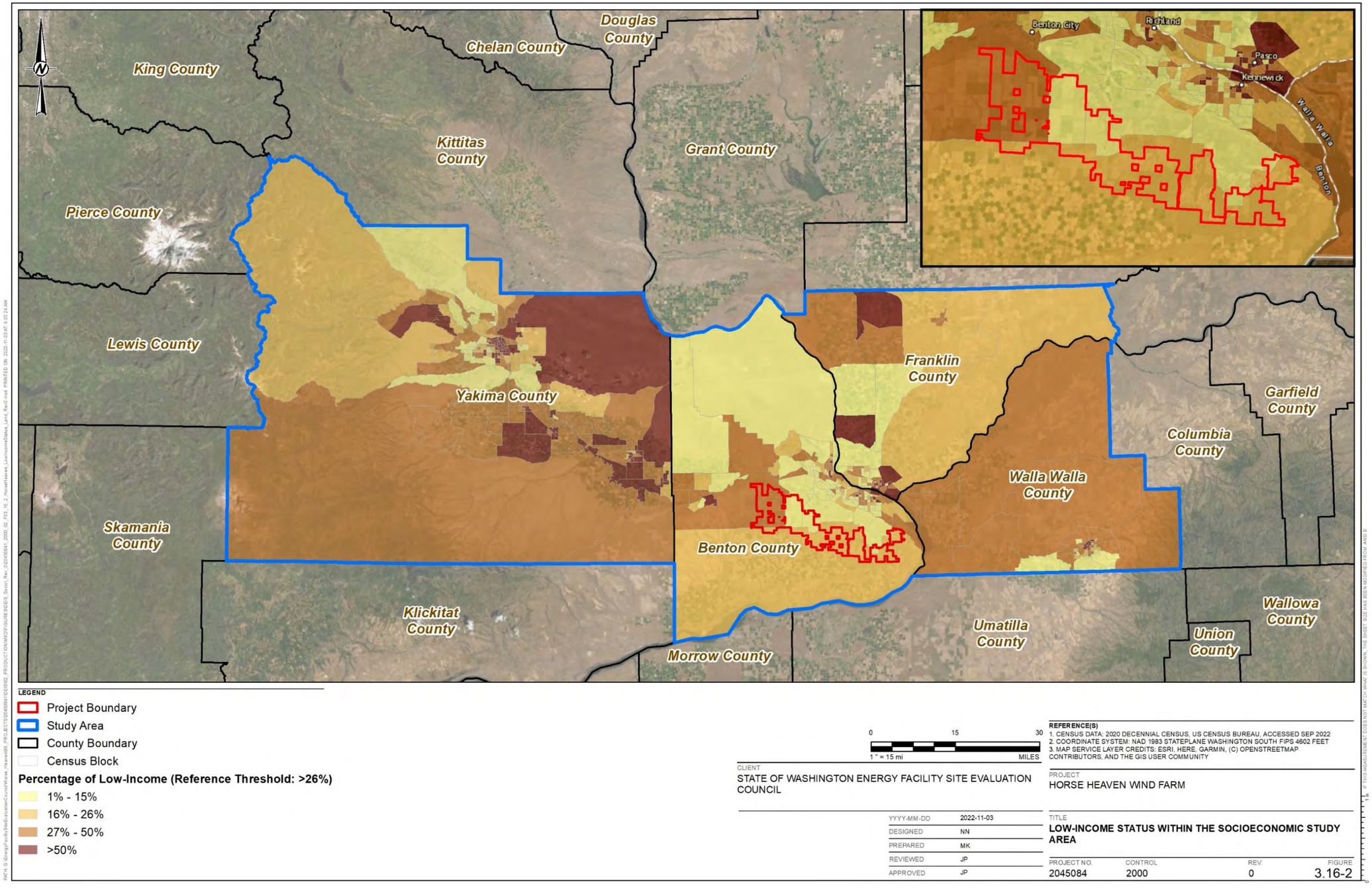


**Figure 3.16-2: Low-income Status within the Socioeconomic Study Area**

### 3.16.1.4 Economic Conditions

The economy in Benton and Franklin Counties has largely been dependent on federal funding for Hanford Site projects. Employment in the Hanford area has decreased in recent years as part of federal spending cuts. This decrease was part of a region-wide decline in employment between 2012 and 2013 and the end of American Recovery and Reinvestment Act funding (BFCOG 2021).

As the Hanford Site's role in the region's economy decreases, agriculture, food processing, and transportation services have experienced growth in recent years. Additional economic trends within the study area relate to increases in agri-tourism. These changes in economic conditions are often associated with an emerging viticulture (wine) industry and specialty crop farming and tourism-related commercial and recreational activities. The region's tourism activities are often associated with the Snake, Columbia, and Yakima Rivers (Benton County 2021a).

### 3.16.1.5 Fiscal Conditions

Fiscal policy is the use of government spending and taxation to influence the economy. Governments typically use fiscal policy to promote strong and sustainable growth and reduce poverty. The following describes the existing fiscal conditions of the four Washington counties in the study area:

- Benton County's most recent financial statement filed with the Office of the Washington State Auditor was submitted in 2020 and covered the period from January 1, 2019 through December 31, 2019. Benton County's general fund is its principal operating reserve. The 2020 annual filing by Benton County with the Washington State Auditor indicates that the county's general fund had total revenues of approximately $69.7 million for the fiscal year that ended December 31, 2019. Taxes accounted for approximately 56 percent of the total account. In 2019, Benton County had total general fund expenditures of approximately $60.1 million, with spending on general government and public safety accounting for approximately 96 percent of the account's total distribution (Washington State Auditor 2020a).
- Franklin County's most recent financial statement filed with the Office of the Washington State Auditor was submitted in 2020 and covered the period of January 1, 2019 through December 31, 2019. Franklin County's general fund is the County's primary operating reserve and is the largest source of day-to-day service delivery. Franklin County had total general fund revenues of $29 million, with property taxes and sales and use taxes accounting for 38 percent and 24 percent of the total account, respectively. Franklin County had total general fund expenditures of approximately $31 million, with spending on general government and public safety accounting for three-quarters of the account's total distribution (Washington State Auditor 2020b).
- Walla Walla County's most recent financial statement filed with the Office of the Washington State Auditor was submitted in 2020 and covered the period from January 1, 2019 through December 31, 2019. The general fund is the chief operating reserve of Walla Walla County. Walla Walla County had total general fund revenues of approximately $18.4 million. Of the approximate $13.6 million in taxes collected, 64.3 percent was from property taxes, 35.1 from sales taxes, and 0.6 percent from other taxes. The total 2019 general fund expenditures, including transfers, were approximately $17.8 million, with spending on general government and public safety accounting for 89 percent of the account's total distribution. Both Walla Walla County's 2019 general fund revenues and expenditures slightly increased when compared with 2018 (Washington State Auditor 2020c).
- Yakima County's most recent financial statement filed with the Office of the Washington State Auditor was submitted in 2021 and covered the period January 1, 2020, through December 31, 2020. The general fund is

the chief operating reserve of Yakima County. Yakima County's general fund had a revenue increase of over $13 million from 2019 revenue. The major increase of over $12 million is attributed to intergovernmental revenues dealing with COVID-19 funds. In 2020, Yakima County had general fund revenues of $80.4 million. Yakima County's general fund expenditures in 2020 were $61.2 million, with spending on general government and public safety accounting for 89 percent of the account's total distribution (Washington State Auditor 2020d).

#### *3.16.1.6 Taxation*

In accordance with RCW 82.08.020, the State of Washington imposes a sales and use tax of 6.5 percent. Sales tax applies to most retail sales of "tangible personal property" within Washington, including some services such as lodging and related services. Use taxes are equivalent to sales taxes and apply to taxable purchases made out of state for use in Washington. State sales and use tax revenues are deposited in the state general fund.

In addition to the 6.5 percent state sales and use tax, local governments can impose local sales taxes on the same tax base as the state. Cities and counties can impose up to 1 percent in "unrestricted" sales taxes that may be used for any lawful government purpose, as well as a number of "restricted" local sales taxes that may only be used for specific purposes (Municipal Research and Services Center 2022). The following describes the 2022 sales tax rates for the counties that occur within the study area (Washington State Department of Revenue 2021):

- **Benton County:** The overall local sales tax total for unincorporated Benton County is 2.1 percent.
- **Franklin County:** the overall local sales tax total for unincorporated Franklin County is 2.1 percent.
- **Walla Walla County:** The overall local sales tax for unincorporated Walla Walla County is 1.5 percent.
- **Yakima County:** The overall local sales tax for unincorporated Yakima County is 1.5 percent.

The State of Washington provides a sale and use tax exemption to wind and solar facilities with a generating capacity over 1 kilowatt. The exemption may be claimed in the form of a sales or use tax remittance of 50, 75, or 100 percent of the sales or use tax paid on qualified machinery and equipment, and installment labor and services (RCW 82.08.962; RCW 82.12.962). The amount of the remittance is determined by criteria established by the Washington Department of Labor and Industries and applied for through the Washington Department of Revenue. The program applies to projects commenced after January 1, 2020, and completed by December 31, 2029 (RCW 82.08.962).

Property taxes are a primary source of revenue for counties in Washington State. The property tax system in Washington State is a "budget-based" system, which means that counties and other taxing districts first establish the total dollar amount of property tax revenue they wish to generate in the upcoming year. Once this amount is established, the county assessor then calculates the applicable levy rate based on the total assessed value of all properties in the county.

The total dollar amount of property taxes to be collected in one year is known as the levy amount. In Washington, the amount the levy can grow from year to year is limited by the "levy lid," also known as the "1% increase limit" or "101% limit." For counties with more than 10,000 residents, like Benton County, annual increases in the levy amount cannot exceed 1 percent or the rate of inflation, whichever is lower, plus an additional amount generated by new construction and "add-ons." These "add-ons" include increases in assessed valuation from the previous year due to new construction and property improvements and construction of renewable energy electricity-generating facilities, including turbine and solar facilities (RCW 84.55.010; Horse Heaven Wind Farm, LLC 2021).

Individual government units with property tax authority in Benton County include the state, county, cities, school districts, hospitals, libraries, and fire districts. These government units, known as taxing districts, combine to form Tax Areas, which represent unique combinations of overlapping taxing districts. The resulting combined levy or millage rate varies by Tax Area (Horse Heaven Wind Farm, LLC 2021). The following describes the property tax process for the State of Washington and Benton County:

- The levy, or millage (mills) rate, which determines the amount an individual property owner owes, is expressed as a dollar amount per $1,000 assessed value. A jurisdiction with a levy rate of 10 mills would impose tax at the rate of $10 per $1,000 of property value.
- The Washington State Constitution requires that levy rates are uniform for all properties within a taxing district. The one exception to this requirement is for agricultural, timber, and open space land.
- The Benton County Levy Rates report for 2021 identified 52 Tax Areas, with corresponding levy rates ranging from 7.37 to 12.8 mills (Benton County 2021b).

### *3.16.1.7 Workforce and Economics*

The region has experienced an increase in economic activities through job expansion in multiple industries. The increase in job opportunities has helped the region retain population and encourage in-migration. The diversity in workforce participation includes professional and technical services, healthcare, education, construction, manufacturing, retail trade, transportation, warehousing, and agriculture (BFCOG 2021). **Table 3.16-7** presents employment data by economic sector for the study area.

**Table 3.16-7: Employment by Economic Sector**

| Economic Sector | Benton County | Franklin County | Walla Walla County | Yakima County | State of Washington |
|---|---|---|---|---|---|
| Total employment | 111,173 | 42,590 | 36,328 | 132,124 | 4,385,827 |
| Farm employment | 5,124 | 4,030 | 3,535 | 19,290 | 90,166 |
| Nonfarm employment | 106,049 | 38,560 | 32,793 | 112,834 | 4,295,661 |
| Private nonfarm employment | 93,565 | 31,639 | 26,514 | 94,702 | 3,655,279 |
| Forestry, fishing, and related activities | NA | NA | NA | 10,470 | 43,128 |
| Mining, quarrying, and oil and gas extraction | NA | NA | NA | 95 | 8,601 |
| Utilities | 165 | NA | 143 | 175 | 5,861 |
| Construction | 9,124 | 3,209 | 1,519 | 5,409 | 271,188 |
| Manufacturing | 4,892 | 3,850 | 4,330 | 8,570 | 289,614 |
| Wholesale trade | 1,629 | 2,068 | 911 | 4,951 | 141,805 |
| Retail trade | 11,803 | 4,140 | 3,007 | 12,896 | 458,066 |
| Transportation and warehousing | 2,352 | NA | 725 | 4,680 | 189,866 |
| Information | 778 | 177 | 323 | 650 | 160,563 |
| Finance and insurance | 3,794 | 712 | 1,100 | 2,939 | 172,563 |
| Real estate and rental and leasing | 3,875 | 1,377 | 1,168 | 3,655 | 202,481 |
| Professional, scientific, and technical services | 11,151 | 1,176 | NA | 3,268 | 343,000 |
| Management of companies and enterprises | 611 | 46 | NA | 754 | 48,440 |

**Table 3.16-7: Employment by Economic Sector**

| Economic Sector | Benton County | Franklin County | Walla Walla County | Yakima County | State of Washington |
|---|---|---|---|---|---|
| Administrative and support and waste management and remediation services | 11,405 | 1,519 | NA | 3,038 | 213,476 |
| Educational services | 1,111 | 614 | NA | 1,974 | 78,717 |
| Health care and social assistance | 15,043 | 3,744 | NA | 18,282 | 491,237 |
| Arts, entertainment, and recreation | 1,544 | 411 | NA | 1,359 | 80,819 |
| Accommodation and food services | 7,281 | 2,043 | NA | 6,437 | 247,746 |
| Other services (except government and government enterprises) | 4,850 | 2,196 | 1,607 | 5,100 | 211,128 |
| Government and government enterprises | 12,484 | 6,921 | 6,279 | 18,132 | 640,382 |
| Federal civilian | 789 | 499 | 1,983 | 1,289 | 78,622 |
| Military | 519 | 232 | 147 | 711 | 68,608 |
| State and local | 11,176 | 6,190 | 4,149 | 16,132 | 493,152 |
| State government | 1,499 | 1,765 | 1,856 | 2,947 | 152,806 |
| Local government | 9,677 | 4,425 | 2,293 | 13,185 | 340,346 |

Source: U.S. Bureau of Economic Analysis 2020 Data (BEA 2022a, 2022b)
NA = not available

The labor market within the State of Washington and study area is summarized as follows (BEA 2022a, 2022b):

- An estimated 111,173 people were employed in Benton County in 2020, while 42,590 were employed in Franklin County. Employment in Benton and Franklin Counties represents 3 percent and 1 percent of the State of Washington's total employment, respectively.
- An estimated 36,328 people were employed in Walla Walla County, and 132,124 were employed in Yakima County in 2020. Walla Walla and Yakima Counties' employed population in 2020 consisted of 1 percent and 3 percent of the State of Washington's total employment, respectively.
- In 2020, farm employment accounted for 2 percent of the state's labor market. Farm employment in the study area counties ranged between 5 and 15 percent. In Benton County, farm employment accounts for approximately 5 percent of the county's workforce.
- In 2020, the private sector employed more people than the public sector in the State of Washington and the study area. The following summarizes employment by the economic sectors that employ the greatest number of residents within the study area:
  - The two largest sectors for employment in Washington were government and health care and social assistance. Government sector jobs represented 15 percent of Washington's workforce and health care, and social assistance represented 11 percent.
  - Government sector represented between 11 and 17 percent of the workforce in Benton, Franklin, Walla Walla, and Yakima Counties in 2020.

- Similar to the State of Washington, the health care and social assistance sector was the second largest employer in Benton and Yakima Counties. Health care and social assistance represented 14 percent of employment within Benton and Yakima Counties.
- In Franklin County, retail trade at 10 percent of work was the second largest employer.

### *3.16.1.8 Housing*

The U.S. Census Bureau defines a housing unit as a house, apartment, mobile home or trailer, group of rooms, or single room occupied or intended to be occupied as separate living quarters. **Table 3.16-8** summarizes housing resources for the State of Washington and study area. The data presented in this table are annual estimates prepared by the U.S. Census Bureau from the 2020 Decennial Census and 2019 American Community Survey 5-Year Estimate.

**Table 3.16-8: Housing Characteristics for the Study Area**

| Geographic Area | Total Housing Units[(a)] | Occupied Housing Units[(a)] | Vacant Housing[(a)] | Median Home Value[(b)] | Median Rent Cost[(b)] |
|---|---|---|---|---|---|
| **Benton County** | 80,076 | 76,369 | 3,707 | $243,600 | $974 |
| Benton City | 1,381 | 1,277 | 104 | $164,000 | Not Available |
| Kennewick | 32,242 | 30,761 | 1,481 | $223,000 | $922 |
| Prosser | 2,346 | 2,164 | 182 | $200,400 | $835 |
| Richland | 25,524 | 24,327 | 1,197 | $267,200 | $1,087 |
| West Richland | 5,773 | 5,628 | 145 | $291,700 | $1,280 |
| Franklin County | 29,740 | 28,748 | 992 | $216,400 | $913 |
| Connell | 1,021 | 958 | 63 | $129,500 | $903 |
| Kahlotus | 70 | 59 | 11 | $122,900 | Not Available |
| Mesa | 119 | 105 | 14 | $93,600 | Not Available |
| Pasco | 24,334 | 23,653 | 681 | $210,000 | $922 |
| **Walla Walla County** | 24,971 | 23,082 | 1,889 | $231,500 | $926 |
| **Yakima County** | 90,504 | 85,882 | 4,622 | $183,800 | $825 |
| **State of Washington** | 3,202,241 | 2,974,692 | 227,549 | $351,300 | $1,258 |

Notes:
[(a)] 2020 Decennial Census Data (U.S. Census Bureau 2021a)
[(b)] ACS (2019) 5-Year Estimate Data (U.S. Census Bureau 2020b)
Not Available = Data not included in the 2019 American Community Survey 5-Year Estimate

The following describes the housing market for the four counties within the study area:

- **Benton County**: An estimated total of 3,707 units were vacant in Benton County in 2020. In 2019, the median home value in Benton County was $243,600. In 2019, there were 21,205 units with a home value less than $300,000 in Benton County. This includes 1,561 units with a value less than $100,000. In 2019, the median monthly rent in Benton County was $974. Median rent for renter-occupied units ranged from almost $835 in Kennewick to more than $1,280 in West Richland (U.S. Census Bureau 2021a, 2020b).
- **Franklin County**: An estimated total of 992 units were vacant in Franklin County in 2020. In 2019, the median home value in Franklin County was $216,400. In 2019, there were 9,692 units with a home value less than

$300,000 in Franklin County. This includes 730 units with a value less than $100,000. In 2019, the median monthly rent in Franklin County was $913. For renter-occupied units, rent ranged from almost $903 in Connell to $922 in Pasco (U.S. Census Bureau 2021a, 2020b).

- **Walla Walla County**: An estimated total of 1,889 units were vacant in Walla Walla County in 2020. In 2019, the median home value in Walla Walla County was $231,500. In 2019, the median home value in Walla Walla County was $216,400. In 2019, there were 5,568 units with a home value less than $300,000 in Walla Walla County. This includes 485 units with a value less than $100,000. In 2019, the median monthly rent in Walla Walla County was $926 (U.S. Census Bureau 2020b, 2021a).
- **Yakima County**: An estimated total of 4,622 units were vacant in Yakima County in 2020. In 2019, the median home value in Yakima County was $183,800. In 2019, there were 25,589 units with a home value less than $300,000 in Yakima County. This includes 3,399 units with a value less than $100,000. In 2019, the median monthly rent in Yakima County was $825 (U.S. Census Bureau 2020b, 2021a).

As presented in **Table 3.16-9**, the number of housing units has increased statewide and in Benton, Franklin, Walla Walla, and Yakima Counties from 2011 through 2021. By percent of total housing units, the counties of Walla Walla and Yakima experienced smaller gains in housing than Benton and Franklin Counties over this same period. Housing in Benton and Franklin Counties increased with net gains of approximately 11,647 units and 5,371 units, respectively. Within the Tri-Cities, the City of Pasco experienced the largest absolute increase over this period, with an additional 5,574 units. Similarly, Richland added approximately 4,673 housing units, while Kennewick added an estimated 3,923 units (OFM n.d.[f]).

**Table 3.16-9: Number of Housing Units in the Study Area**

| Geographic Area | Total Housing Units 2011 | Total Housing Units 2021 | Percent Change | Annual Growth Rate |
|---|---|---|---|---|
| **Benton County** | 69,739 | 81,386 | 16.7 % | 1.7 % |
| Benton City | 1,241 | 1,403 | 13.1 % | 1.3 % |
| Kennewick | 28,745 | 32,668 | 13.6 % | 1.4 % |
| Prosser | 2,134 | 2,375 | 11.3 % | 1.1 % |
| Richland | 21,232 | 25,905 | 22.0 % | 2.2 % |
| West Richland | 4,606 | 6,104 | 32.5 % | 3.3 % |
| **Franklin County** | 25,070 | 30,441 | 21.4 % | 2.1 % |
| Connell | 931 | 1,031 | 10.7 % | 1.1 % |
| Kahlotus | 113 | 67 | **-40.7 %** | **-4.1 %** |
| Mesa | 128 | 120 | **-6.3 %** | **-0.6 %** |
| Pasco | 19,350 | 24,924 | 28.8 % | 2.9 % |
| **Walla Walla County** | 23,537 | 25,079 | 6.6 % | 0.7 % |
| **Yakima County** | 85,940 | 91,292 | 6.2 % | 0.6 % |
| **State of Washington** | 2,904,623 | 3,248,747 | 11.8 % | 1.2 % |

Source: OFM n.d.(f)
Notes: Postcensal data for each calendar year between the census and the current year are updated annually using information on the components of population change.
Bold = Loss of available housing

## *Temporary Housing*

**Table 3.16-10** summarizes the rental housing market for the study area. Viewed by county, these estimates suggest that rental housing is available throughout the study area. The U.S. Census Bureau's American Community Survey 2019 5-Year data indicates rental vacancy rates for the study area counties ranged from 2.7 percent in Franklin County to 6.1 percent in Walla Walla County. Vacancy rates within the Tri-Cities ranged from 2.3 percent in Pasco, Washington to 6.6 percent in Richland, Washington (U.S. Census Bureau 2020b).

**Table 3.16-10: Rental Market Conditions for Study Area Counties**

| Geographic Area | Total Housing Units | Occupied and Paying Rent | Rental Vacancy Rates (%) | Units Available for Rent[a] | Seasonal, Recreational, or Occasional Use |
|---|---|---|---|---|---|
| **Benton County** | 76,241 | 21,360 | 5.1 | 1660[b] | 378[b] |
| Benton City | Not Available | Not Available | Not Available | Not Available | Not Available |
| Kennewick | 31,093 | 10,363 | 5.2 | 539 | Not Available |
| Prosser | 2,635 | 930 | 0.0 | 0 | Not Available |
| Richland | 23,582 | 7,415 | 6.6 | 489 | Not Available |
| West Richland | 4,931 | 724 | 0.0 | 0 | Not Available |
| **Franklin County** | 28,063 | 8,021 | 2.7 | 217 | Not Available |
| Connell | 1,208 | 478 | 3.2 | 15 | Not Available |
| Kahlotus | Not Available | Not Available | Not Available | Not Available | Not Available |
| Mesa | Not Available | Not Available | Not Available | Not Available | Not Available |
| Pasco | 22,736 | 6,561 | 2.3 | 151 | Not Available |
| **Walla Walla County** | 24,745 | 7,645 | 6.1 | 466 | Not Available |
| **Yakima County** | 88,698 | 28,647 | 2.8 | 793[b] | 1,431[b] |
| **State of Washington** | 3,106,528 | 1,014,639 | 3.6 | 49,286[b] | 91,657[b] |

Source: U.S. Census Bureau 2020b
Notes:
[a] Housing units for seasonal, recreational, or occasional use are generally considered to be vacation homes. They are not included in the estimated number of housing units available for rent.
[b] 2019 American Community Survey 1-Year Estimate
Not Available = Data not included in the 2019 American Community Survey 5-Year Estimate

Within the study area, temporary housing is also available in the form of hotel and motel rooms. Data compiled by travel research firm STR Global identified 44 hotels in the Tri-Cities area in November 2017, with a total of 4,063 guestrooms (ECONorthwest 2018). STR Global compiles data for commercial lodging establishments with at least 15 rooms. STR Global does not count single-room occupancy hotels, most bed and breakfast inns, or short-term rentals (e.g., Airbnb) (Horse Heaven Wind Farm, LLC 2021).

ECONorthwest in 2018 predicted that the number of guestrooms in the Tri-Cities is expected to increase to about 4,700 in ensuing years. The Tri-Cities short-term rental market is seasonal, with monthly occupancy rates ranging from 42 percent in December to 77 percent in June. Occupancy in July and August averaged 69 percent (Horse Heaven Wind Farm, LLC 2021). Additionally, ECONorthwest states that the Tri-Cities attract a larger than average share of business and meeting visitors, which tends to support higher occupancy in the spring and fall (ECONorthwest 2018).

In addition to short-term rentals, temporary accommodations in the study area also include recreational vehicle (RV) parks and campsites. Within Benton and Franklin Counties, there are 12 RV parks and campgrounds, with a total of 1,320 RV spaces (Horse Heaven Wind Farm, LLC 2021).

### *3.16.1.9 Schools*

**Table 3.16-11** summarizes school district, enrolment, and teacher data for the school districts within the study area. Student/teacher ratios, calculated by dividing the total number of students by the total number of full-time equivalent teachers, is a common measure used to assess the overall quality of a school. The statewide average ratio in Washington was 18.4 for the 2019 through 2020 school year. The national student/teacher ratio for the 2019 through 2020 school year was 15.9. The average student/teacher ratios for the study area counties were less than the state ratio and ranged from 12.4 in Walla Walla County to 17.6 in Franklin County (NCES 2022a).

**Table 3.16-11: School Districts within the Project Vicinity**

| Study Area County | School District | Total Number of Schools | Total Number of Students | Number of FTE Teachers | Student/ Teacher Ratio |
|---|---|---|---|---|---|
| Benton | Finley School District | 3 | 875 | 49.60 | 17.64 |
| Benton | Kennewick School District | 32 | 18,396 | 1,048.09 | 17.55 |
| Benton | Kiona-Benton City School District | 4 | 1,385 | 78.28 | 17.69 |
| Benton | Paterson School District | 1 | 138 | 9.90 | 13.94 |
| Benton | Prosser School District | 6 | 2,540 | 137.25 | 18.51 |
| Benton | Richland School District | 21 | 13,596 | 695.51 | 19.55 |
| Franklin | Educational Service District 123 | 2 | 82 | 2.00 | 41.00 |
| Franklin | Kahlotus School District | 1 | 37 | 9.67 | 3.83 |
| Franklin | North Franklin School District | 9 | 2,064 | 116.71 | 17.68 |
| Franklin | Pasco School District | 28 | 18,614 | 1,024.26 | 18.17 |
| Franklin | Star School District No. 054 | 1 | 15 | 2.00 | 7.50 |
| Walla Walla | College Place School District | 4 | 1,610 | 92.72 | 17.36 |
| Walla Walla | Columbia (Walla Walla) School District | 3 | 734 | 43.71 | 16.79 |
| Walla Walla | Prescott School District | 3 | 253 | 18.42 | 13.74 |
| Walla Walla | Touchet School District | 1 | 212 | 19.40 | 10.93 |
| Walla Walla | Waitsburg School District | 3 | 263 | 17.07 | 15.41 |
| Yakima | East Valley School District | 5 | 3,172 | 178.26 | 17.79 |
| Yakima | Grandview School District | 7 | 3,635 | 192.28 | 18.90 |
| Yakima | Granger School District | 3 | 1,449 | 88.48 | 16.38 |
| Yakima | Highland School District | 5 | 1,103 | 61.47 | 17.94 |
| Yakima | Mabton School District | 3 | 836 | 50.05 | 16.70 |
| Yakima | Mount Adams School District | 3 | 857 | 53.27 | 16.09 |
| Yakima | Naches Valley School District | 4 | 1,220 | 74.09 | 16.47 |
| Yakima | Selah School District | 10 | 3,694 | 218.38 | 16.92 |
| Yakima | Sunnyside School District | 9 | 6,712 | 364.56 | 18.41 |
| Yakima | Toppenish School District | 9 | 4,450 | 197.30 | 22.55 |
| Yakima | Union Gap School District | 1 | 568 | 35.43 | 16.03 |
| Yakima | Wapato School District | 8 | 3,279 | 196.44 | 16.69 |

**Table 3.16-11: School Districts within the Project Vicinity**

| Study Area County | School District | Total Number of Schools | Total Number of Students | Number of FTE Teachers | Student/ Teacher Ratio |
|---|---|---|---|---|---|
| Yakima | West Valley School District | 16 | 5,313 | 264.23 | 20.11 |
| Yakima | Yakima School District | 29 | 15,858 | 873.56 | 18.15 |
| Yakima | Zillah School District | 4 | 1,274 | 72.02 | 17.6 |

Source: NCES 2022b
Note: District Details (2020–2021 school year; fiscal data from 2017–2018)
FTE = full-time equivalent

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**APPENDIX 3.5-1**

# Habitat Subtype Photographs

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**Photo 1: Active wheat field representative of the agriculture habitat type (Tetra Tech 2021[1]).**

**Photo 2: Developed or disturbed habitat type (Tetra Tech 2021).**

[1] Tetra Tech. 2021. 2021 Botany and Habitat Survey Report for Horse Heaven Wind Farm. Prepared for Horse Heaven Sind Farm, LLC by Tetra Tech. August 2021.

**Photo 3: Eastside (interior) grassland along Badger Canyon (Tetra Tech 2021).**

**Photo 4: Non-native grassland dominated by cheatgrass (*Bromus tectorum*) and cereal rye (*Secale cereale*) (Tetra Tech 2021).**

**Photo 5: High-quality planted grassland dominated by native plants big bluegrass (*Poa secunda* ssp. *juncifolia*) and bluebunch wheatgrass (*Pseudoroegneria spicata*) (Tetra Tech 2021).**

**Photo 6: Dwarf shrub-steppe dominated by rock buckwheat (*Eriogonum sphaerocephalum*) and Sandberg bluegrass (*Poa secunda*) in the northwestern part of the Micrositing Corridor (Appendix K, Horse Heaven Wind Farm, LLC 2021[2]).**

[2] Horse Heaven Wind Farm, LLC. 2021a. Horse Heaven Wind Farm Washington Energy Facility Site Evaluation Council Application for Site Certification. EFSEC. Docket Number: EF-210011. February 2021.

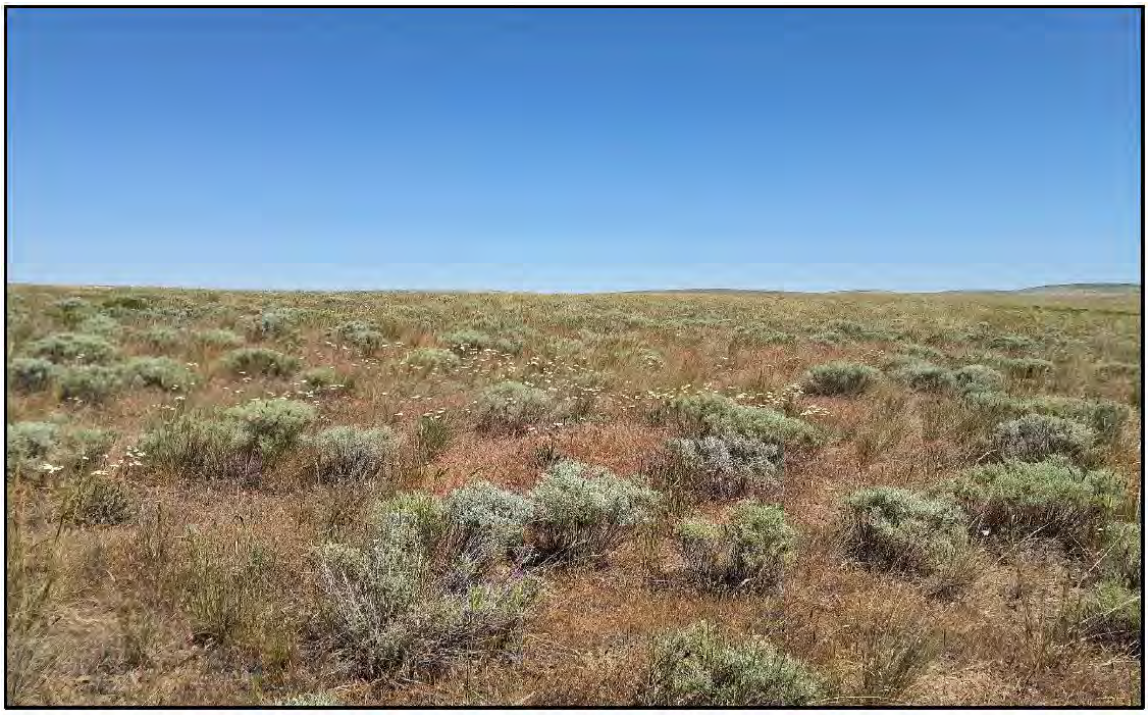

**Photo 7: Rabbitbrush shrubland in area that was burned in 1990 during the Locust Grove Fire (Tetra Tech 2021).**

**Photo 8: Big sagebrush shrub-steppe habitat with evidence of disturbance from high cover of cheatgrass (Tetra Tech 2021).**

**APPENDIX 3.8-1**

# Land and Shoreline Use Consistency Analysis

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## Comprehensive Plan Analysis

**Table 3.8-1A** shows an analysis of the Project's consistency with the Benton County Comprehensive Plan's relevant goals and policies. Revised Code of Washington (RCW) 36.70B.040 requires that, at minimum, Growth Management Act (GMA) regulated counties and cities must consider the following four factors in determining a proposed project's consistency with their development regulations or, in the absence of applicable development regulations, with their comprehensive land use plans:

- The type of land use allowed, such as the land use designation
- The level of development allowed, such as units per acre or other measures of density
- Infrastructure, such as the adequacy of public facilities and services to serve a proposed project
- The characteristics of the proposed development, measured by the degree to which a project conforms to specific development regulations or standards

For aspects of the Project's design that are not in alignment with the Benton County Comprehensive Plan, EFSEC would review discrepancies through an adjudicative process intended to resolve disputes between the local government and the Applicant.

**Table 3.8-1A: Benton County Comprehensive Plan Update Goals and Policies Consistency Analysis**

| Element Goal / Policy | Analysis |
|---|---|
| LU Goal 1: Ensure that land uses are compatible with surrounding uses that maintain public health, safety, and general welfare. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which provides that commercial wind farms and major solar power generating facilities may be permitted within the GMA Agricultural District if a conditional use permit is issued by the Hearing Examiner. |
| LU Goal 1 Policy 1: Maintain a mix of land uses that supports the character of each rural community. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which allows commercial wind farms with approval of a conditional use permit issued by the Board of County Commissioners. |
| LU Goal 1 Policy 3: Maximize the opportunities for compatible development within land use designations to serve a multitude of compatible uses and activities. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which allows commercial wind farms with approval of a conditional use permit issued by the Board of County Commissioners. |
| LU Goal 6: Preserve rural lifestyles outside UGAs and incorporated areas while accommodating new population growth consistent with the protection of rural character. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which allows commercial wind farms with approval of a conditional use permit issued by the Board of County Commissioners. |
| LU Goal 6 Policy 2: Development in rural areas is typified by large lots and less dense development. Favoring development that is less dense and has larger lots helps maintain the rural character of designated rural areas and supports the protection of ground and surface water. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which allows commercial wind and solar farms with approval of a conditional use permit issued by the Board of County Commissioners. |

**Table 3.8-1A: Benton County Comprehensive Plan Update Goals and Policies Consistency Analysis**

| Element Goal / Policy | Analysis |
|---|---|
| LU Goal 6 Policy 3: Designated rural areas will be utilized to reduce the inappropriate conversion of agricultural lands, prevent sprawling low-density development and assure that rural development is compatible with surrounding rural and agricultural areas. | The Project is consistent with LU Goal 6 Policy 3 as agricultural practices within the Lease Boundary may be allowed to continue throughout the operations phase. Additionally, the Project's presence would prevent future low-density, sprawling development within the Lease Boundary. |
| LU Goal 6 Policy 14: Support and encourage the use of and application of Firewise principles and other fire risk reduction measures consistent with the Benton County Natural Hazard Mitigation Plan and Community Wildfire Protection Plan to reduce fire risk for urban development, urban subdivisions, rural subdivisions and large rural developments susceptible to wildfires. Encourage the implementation of the Firewise principles, or similar best management measures, applicable to individual lots on all lots at risk from wildfires. | Appendix P of the Applicant's ASC includes a Draft Emergency Response Plan that addresses fire prevention and calls for the preparation of a Fire Prevention Plan. If the Applicant complies with their Draft Emergency Response Plan and prepares a site-specific Fire Prevention Plan, the Project would be consistent with LU Goal 6 Policy 14. |
| LU Goal 6 Policy 15: Encourage new rural development away from the 100-year floodplain, and as guided in the County's Flood Damage Prevention Ordinance, CAO, and SMP. | The Project is consistent with LU Goal 6 Policy 15 as the Lease Boundary does not intersect the referenced special land use designations. |
| NR Goal 1: Conserve and maintain agricultural land of long-term commercial significance as the local natural resource most essential for sustaining the County's agricultural economy. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which allows commercial wind and solar farms with approval of a conditional use permit issued by the BCC. Additionally, portions of the Project area would still be able to support agricultural activities. |
| NR Goal 1 Policy 1: Conserve areas designated "GMA Agriculture" in the Comprehensive Plan for a broad range of agricultural uses to the maximum extent possible and protect these areas from the encroachment of incompatible uses. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which allows commercial wind and solar farms with approval of a conditional use permit issued by the Board of County Commissioners. Additionally, portions of the Project area would still be able to support agricultural activities. |
| NR Goal 1 Policy 3: Recognize that only uses related or ancillary to, supportive of, complementary to, and/or not in conflict with agricultural activities are appropriate in areas designated GMA Agriculture. | The Project is consistent with BCC zoning ordinance Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit, which allows commercial wind and solar farms with approval of a conditional use permit issued by the Board of County Commissioners. Additionally, portions of the Project area would still be able to support agricultural activities. |

**Table 3.8-1A: Benton County Comprehensive Plan Update Goals and Policies Consistency Analysis**

| Element Goal / Policy | Analysis |
|---|---|
| WR Goal 1: Conserve, maintain, and manage existing ground and surface water resources to meet existing and future water supply needs for cities, farms, industry, and rural growth. | The ASC states that the Project would obtain water through a vendor agreement and that water obtained from the City of Kennewick's water system would be hauled to the site for the Project's construction, operations, and decommissioning phases. As part of their commitments, the Applicant has identified water conservation practices that the Project would apply throughout each phase of the Project. As a result of not drawing water directly from a surface water or groundwater source, the Project is consistent with WR Goal 1. |
| WR Goal 4: Protect and enhance surface water resources to support rivers, streams, and wetlands that support fish and wildlife species and associated habitats. | There are no major rivers or other perennial streams within the Project Lease Boundary; however, the ASC presents a list of Applicant commitments that would assist in minimizing off-site impacts from erosion, sedimentation, and stormwater runoff. Through the implementation of Applicant commitments, the Project would be consistent with WR Goal 4. |
| Critical Areas (CA) Goal 1: Protect the functions and values of critical areas within the county with land use decision-making and development review. | The Project is consistent with CA Goal 1 as the Applicant has submitted an ASC to EFSEC for review and EFSEC is preparing a SEPA-compliant EIS. Additionally, the Project would require a conditional use permit under Chapter 11.17.070 Growth Management Act Agricultural District – Uses Requiring a Conditional Use Permit from the Board of County Commissioners. |
| CA Goal 1 Policy 1: Apply standards, regulations, and mitigation strategies to development during the permitting and development approval process that protects critical areas functions and values. | The Project is consistent with CA Goal 1 Policy 1 as the Applicant has submitted an ASC to EFSEC for review that is inclusive of mitigation strategies in response to applicable regulations. Additionally, EFSEC is preparing a SEPA-compliant EIS that includes Applicant commitments and mitigation strategies that address potential impacts on critical areas. |
| CA Goal 2: Protect life and property and avoid or mitigate significant risks to public and private property and to public health and safety that are posed by frequently flooded and geologic hazard areas. | The Project is consistent with CA Goal 2 as it would be constructed in accordance with applicable codes and standards. |
| CA Goal 2 Policy 1: Limit developments in areas with higher risk for natural disaster or geologic hazard unless it can be demonstrated by the project proponent that the development is sited, designed, and engineered for long term structural integrity and that life and property on- and off-site are not subject to increased risk as a result of the development. | The Project is consistent with CA Goal 2 as it would be constructed in accordance with applicable codes and standards. |
| CA Goal 3: Protect the County's natural areas, shorelines, and critical areas as unique assets to the community. | The Project is consistent with CA Goal 3 as the Lease Boundary does not intersect a major river or other perennial streams. |
| CA Goal 3 Policy 1: Use the CAO, SMP, SEPA, and other ordinances, as applicable, to designate and protect critical areas and the natural environment. | The Project is consistent with CA Goal 3 Policy 1 as EFSEC is preparing a SEPA EIS that includes Applicant commitments and mitigation strategies that address potential impacts on critical areas. |

**Table 3.8-1A: Benton County Comprehensive Plan Update Goals and Policies Consistency Analysis**

| Element Goal / Policy | Analysis |
|---|---|
| CA Goal 5: Achieve balance among economic uses of land and critical areas protection. | The Project is consistent with CA Goal 5 as the Project's micrositing corridors are designed to avoid, where possible, Benton County's designated critical areas within the Project Lease Boundary. Where critical areas cannot be avoided, the Applicant proposes minimization and mitigation measures to protect critical areas functions and values. |
| CA Goal 5 Policy 1: Work with state, federal, and local agencies and other County stakeholders regarding the application of environmental protection laws and regulations. | The Project is consistent with CA Goal 5 Policy 1 as EFSEC is preparing a SEPA-compliant EIS. |
| ED Goal 2: Expand employment opportunities in unincorporated Benton County. | The Project is consistent with ED Goal 2 as it would have beneficial direct, indirect, and induced economic impacts within unincorporated Benton County for the construction, operations, and decommissioning phases. |
| ED Goal 3: Provide areas for the location of light and environmentally acceptable heavy industrial uses, while minimizing impacts on surrounding rural uses. | The Project is consistent with ED Goal 3 as it would allow for continued agricultural activities within the Lease Boundary. |
| ED Goal 3 Policy 2: Do not locate non-agricultural related industry on "GMA Agriculture" designated land. | The Project may not be in alignment with ED Goal 3 Policy 2; however, as currently designed, it would allow for continued agricultural activities within the Lease Boundary. |
| PL Goal 3: Conserve visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape and are uniquely a product of the ice age floods. | The Project is consistent with PL Goal 3 as it would not affect the prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape associated with the ice age floods. |
| PL Goal 3 Policy 1: Identify and preserve historically significant structures and sites whenever feasible. | The Project is consistent with PL Goal 3 Policy 1 as the Applicant's ASC documents archaeological and architectural surveys of the affected environment and states that the Project would be designed to avoid historically significant structures and sites. |
| PL Goal 4: Preserve significant historic structures, districts, and cultural resources that are unique to Benton County. | The Project is consistent with PL Goal 4 as the Applicant's ASC documents archaeological and architectural surveys of the affected environment and states that the Project would be designed to avoid historically significant structures and sites. |
| PL Goal 4 Policy 1: Coordinate with local tribes to protect historic and cultural resources. | The Project is consistent with PL Goal 4 Policy 1 as the Applicant's ASC provides documentation of tribal consultation. |
| PL Goal 4 Policy 2: Preserve archaeologically significant sites by siting and designing development to avoid or mitigate impacts. | The Project is consistent with PL Goal 4 Policy 2 as the Applicant's ASC documents archaeological surveys of the affected environment and states that the Project would be designed to avoid historically significant structures and sites. |
| UE Goal 2: Maintain public and private household water and sewer systems that are consistent with the rural character of the County. | The Project is consistent with UE Goal 2 as the Applicant's ASC states that water from the City of Kennewick's water system would be hauled to the site. Additionally, the Applicant's ASC states that the Project would discharge wastewater from the O&M facilities to an on-site septic system. |

**Table 3.8-1A: Benton County Comprehensive Plan Update Goals and Policies Consistency Analysis**

| Element Goal / Policy | Analysis |
|---|---|
| UE Goal 3: Facilitate efficiency in utility land use and development. | The Project is consistent with UE Goal 3 as the majority of the proposed transmission line route occurs on private property, where ongoing agricultural activity would occur along the corridors. |
| UE Goal 3 Policy 2: Encourage multiple uses, including passive recreational use, in utility corridors where practical. | The Project is consistent with UE Goal 3 Policy 2 as passive recreational uses within the proposed transmission line corridor would be possible on DNR land where practical. Additionally, the right-of-way for the transmission line would not be fenced. |
| UE Goal 3 Policy 3: Facilitate maintenance and rehabilitation of existing utility systems and facilities and encourage the use of existing transmission/distribution corridors. | The Project is consistent with UE Goal 3 Policy 3 as the transmission line connecting the Project's substations within the Project Lease Boundary would traverse parcels to optimize the most direct route between substations while minimizing potential environmental and agricultural impacts on surrounding lands. The eastern Project substation has been located adjacent to BPA's proposed Bofer Canyon substation, thereby eliminating the need for new transmission lines at this location. Proposed transmission lines would be located adjacent and parallel to existing public road right-of-way where possible. |

Source: Benton County 2020; Horse Heaven Wind Farm, LLC 2021
Applicant = Horse Heaven Wind Farm, LLC; ASC = Application for Site Certificate; BCC = Benton County Code; BPA = Bonneville Power Administration; CA = Critical Areas; CAO = Critical Areas Ordinance; DNR = Washington State Department of Natural Resources; ED = Economic Development; EIS = environmental impact statement; GMA = Growth Management Act; LU = Land Use; NR = Natural Resources; O&M = operations and maintenance; PL = Parks, Recreation, Open Space, and Historic Preservation; SEPA = Washington State Environmental Policy Act; SMP = Shoreline Master Program; UE = Utilities Element; UGA = Urban Growth Area; WR = Water Resources

## Consistency Analysis – Benton County Code (Zoning Ordinance)

Areas within Benton County that maintain critical agricultural resources are zoned in accordance with BCC 11.17.030, GMA Agricultural District. These areas are officially demarcated on the Official Zoning Map of Benton County and in the Benton County Comprehensive Plan (see Section 3.8).

Under the version of BCC 11.17.070 that was in effect when the ASC was filed with EFSEC, wind farms, major solar-generating facilities, and ancillary buildings and structures may be permitted within a GMA Agricultural District with approval of a conditional use permit. For any aspects of the Project's design that are not in alignment with Benton County Code (BCC) 11.17.070 Growth Management Act Agricultural District (as in effect at the time of application), EFSEC may consider in the adjudication whether inconsistent provisions should be preempted, and if so, whether any conditions should be included to serve the purpose of such provisions.

**Table 3.8-2A** presents the BCC requirements for the development of a commercial wind farm on land zoned GMA Agricultural District, as well as a consistency analysis between the Project and the ordinance requirement.

**Table 3.8-2A: Benton County Zoning Ordinance Consistency Analysis**

| Ordinance Requirement | Consistency Analysis |
|---|---|
| 11.17.070(q)(1). The lowest point on all rotor blades must be at least thirty (30) feet above ground level; | The Project is consistent with BCC 11.17.070(q)(1). The lowest point on the proposed turbine rotor blades would be 36.5 feet above ground level. |
| 11.17.070(q)(2). All wind turbine tower bases must be set back from all dwellings not located on the same parcel at least one thousand six hundred and forty (1,640) feet; | The ASC states that each turbine tower base would be set back a conservative distance of at least 1,250 feet from all dwellings not located on the same parcel. Should the final turbine layout involve the placement of turbines closer than 1,640 feet from dwellings not located on the same parcel, the Project **would not be in alignment** with BCC 11.17.070(q)(2). |
| 11.17.070(q)(3). All wind turbine tower bases must be set back from all property lines a distance equal to the associated wind turbine height plus 50 percent of that height, except that, where contiguous properties are leased for an identical duration for development of a wind farm, the tower bases set back from the property lines common with such leased properties may be eliminated so long as no part of any wind turbine extends past any such interior property lines and the above-required setbacks are maintained from the property lines comprising the exterior boundaries of the wind farm; | The Project **may not be in alignment** with BCC 11.17.070(q)(3) as the ASC states, “each turbine tower base is set back at least 499 feet or 671 feet from exterior property lines, depending on Turbine model, ensuring the setback is equal to or greater than the proposed maximum Turbine heights for Turbine Array Option 1 and Option 2 (ground to blade tip) of 499 feet and 671 feet, respectively.” Using the formula provided in BCC 11.17.070(q)(3), the appropriate setback from all property lines where properties are not contiguously leased is 749 feet under Turbine Option 1 and 1,004 feet under Turbine Option 2. |
| 11.17.070(q)(4). All wind turbine tower bases must be set back from the closest edge of a state, county, or city road right-of-way distance equal to the wind turbine height plus 50 percent of that height; | The Project **may not be in alignment** with BCC 11.17.070(q)(4) as the ASC states, each turbine tower base is set back at least 650 feet or 671 feet from the closest edge of any state and county road right-of-way within the Lease Boundary.” Using the formula provided in BCC 11.17.070(q)(4), the appropriate setback from the closest edge of a state, county, or city road right-of-way is 749 feet under Turbine Option 1 and 1,004 feet under Turbine Option 2. |
| 11.17.070(q)(5). All wind turbine tower bases must be set back a distance equal to the wind turbine height from all borders of the GMA Agricultural District, except for GMA Agricultural District borders adjacent to the Hanford Reservation owned by the Department of Energy or adjacent to another zoning district adopted by another county that contains a general minimum parcel size of at least twenty (20) acres per parcel; | The Project is consistent with BCC 11.17.070(q)(5). The ASC states that each turbine tower base is set back at least 499 feet or 671 feet from exterior property lines, including borders of the GMA Agricultural District. The setback distances are equal to or greater than the proposed maximum turbine heights for Option 1 and Option 2 of 499 feet and 671 feet, respectively. The Project would not be adjacent to the Hanford Reservation or another county. |
| 11.17.070(q)(6). For wind turbine(s) proposed to be located within four (4) miles of the nearest point of the nearest runway of the nearest airport available for public use, the applicant for a building permit must comply with all the requirements imposed by the Federal Aviation Administration (FAA) and provide a written statement from the FAA that sets forth the FAA's comments and requirements, if any, for the proposal; | The Project is consistent with BCC 11.17.070(q)(6). No turbine locations are proposed within 4 miles of the nearest point of the nearest runway of the nearest airport available for public use, which is the Tri-Cities Airport. The nearest turbine would be located approximately 9.9 miles south of the Tri-Cities Airport. |

**Table 3.8-2A: Benton County Zoning Ordinance Consistency Analysis**

| Ordinance Requirement | Consistency Analysis |
|---|---|
| 11.17.070(q)(7). All wind turbine(s) must comply with the Federal Aviation Regulations Part 77, Objects Affecting Navigable Airspace, as currently in effect or as hereafter amended, including but not limited to, providing such notices to the FAA as required thereunder and compliance with all requirements or prohibitions imposed by the FAA on the applicant's proposal; | The Project is consistent with BCC 11.17.070(q)(7). Per FAA regulations, the Project would provide a Notice of Proposed Construction or Alteration to the FAA and obtain a Determination of No Hazard prior to construction. |
| 11.17.070(q)(8). Conditional use permit applications for the placement and operation of wind turbines under this section shall be made available for review by the United States Department of Defense (USDOD) in accordance with RCW 36.01.320, as in effect now or hereafter amended. The notice and processing of wind turbine permit applications will be in accordance with Benton County Code chapter 17.10. Pursuant to BCC 11.50.040 (d), the applicant is required to provide sufficient evidence to persuade the Hearings Examiner that the proposed wind turbine is compatible with other uses in the surrounding area, including any military training activities, or is no more incompatible than are any other outright permitted uses in the applicable zoning district, as well as provide all other evidence required by BCC 11.50.040; | The Project is consistent with BCC 11.17.070(q)(8). The Project layout avoids military training areas and would not interfere with military training activities. |
| 11.17.070(q)(9). All wind turbine tower bases shall be located at least forty (40) feet for every one (1) foot of tower height or one mile, whichever is greater, from the ends of and at least five thousand (5,000) feet from the sides of all runways which are available solely for private use and identified on the most current edition of the Sectional Aeronautical Charts produced by the National Aeronautical Charting Office (NACO); | The Project is consistent with BCC 11.17.070(q)(9). The Project has been designed to locate turbines over 5,000 feet from the sides of all private runways identified on the most current edition of the Sectional Aeronautical Charts. Coopers Landing is the nearest runway available solely for private use and is located approximately 2 miles northeast of the Project's nearest turbine tower base. The private runway at Coopers Landing runs east to west. Based on this heading, no turbine under Option 1 or 2 would occur within 40 feet for every 1 foot of tower height from the ends of the runway, which is measured at 3.8 and 5.1 miles, respectively. |
| 11.17.070(q)(10). If the use of any wind turbine or wind turbine farm is discontinued for a period of one (1) year or more, the owner of such facility shall remove the facility within ninety (90) days of written notification by the Planning Department. If such facility is not removed within said ninety (90) days, the County may refer the issue to the code enforcement officer for appropriate action pursuant to Chapter 11.43 BCC; | The Project is consistent with BCC 11.17.070(q)(10). The Project is expected to have an operational life of 35 years. |

**Table 3.8-2A: Benton County Zoning Ordinance Consistency Analysis**

| Ordinance Requirement | Consistency Analysis |
|---|---|
| 11.17.070(q)(11). The wind turbine(s) and all associated service roads may not displace more than five (5) percent of the area of that parcel(s) on which they are located. | The Project is consistent with BCC 11.17.070(q)(11). Permanent disturbances associated with turbine tower foundation pedestals and permanent disturbances associated with the Project's new 16-foot-wide access roads would not displace more than 5% of the parcel area on which they are located. |

Source: Benton County 2021; Horse Heaven Wind Farm, LLC 2021
Notes:
[a] Turbine Height = ground to blade tip height
ASC = Application for Site Certification; BCC = Benton County Code; FAA = Federal Aviation Administration; GMA = Growth Management Act; NACO = National Aeronautical Charting Office; RCW = Revised Code of Washington; USDOD = U.S. Department of Defense

**Table 3.8-3A** presents the five requirements under BCC 11.50.040(d) for when a conditional use permit may be issued by Benton County and response based on existing conditions and Project information.

**Table 3.8-3A: Benton County Conditional Use Permit Requirements and Project Analysis**

| Conditional Use Permit Requirement | Project Comparison |
|---|---|
| (a) Is compatible with other uses in the surrounding area or is no more incompatible than are any other outright permitted uses in the applicable zoning district. | Nine Canyon Wind Farm received a permit from Benton County that allowed it to be constructed on Growth Management Act Agricultural District zoned land which indicates that the Project is not any less compatible than what has previously been permitted within the applicable zoning district. |
| (b) Will not materially endanger the health, safety, and welfare of the surrounding community to an extent greater than that associated with any other permitted uses in the applicable zoning district. | An analysis of Public Health and Safety is provided in Section 4.13. |
| (c) Would not cause the pedestrian and vehicular traffic associated with the use to conflict with existing and anticipated traffic in the neighborhood to an extent greater than that associated with any other permitted uses in the applicable zoning district. | An analysis of recreation and traffic is provided in Sections 4.12 and 4.14, respectively. |
| (d) Will be supported by adequate service facilities and would not adversely affect public services to the surrounding area. | An analysis of public services and utilities is provided in Section 4.15. |
| (e) Would not hinder or discourage the development of permitted uses on neighboring properties in the applicable zoning district as a result of the location, size or height of the buildings, structures, walls, or required fences or screening vegetation to a greater extent than other permitted uses in the applicable zoning district. | An analysis of project impacts on land use is provided in Section 4.8. The adjudication process for the Project would allow interested parties including neighbors to participate in the project's review process. Through this process, conditions may be placed upon the Project's construction and operations that address issues involving development of permitted uses on neighboring properties. |

**APPENDIX 3.10-1**

# Sky Glow Information and Comparisons

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## Sky Glow Information and Comparisons

The earliest measures of sky glow, also called sky brightness, were based on a scale upon which the magnitude of stars visible to the human eye is divided into six levels. The brightest star is a magnitude 1, and the dimmest (faintest) star is a magnitude 6. More recently, the magnitude scale was modified to express astronomical surface brightness (stars, planets, etc.) in units known as magnitudes per square arcsecond (mag/arcsec2) as measured by a Sky Quality Meter (SQM). The measurement scale is inverse and logarithmic and is generally used in small area photometry and astronomy (Bortle 2001).

**Sky Glow Comparison Table**

| Class | Title | Approx. SQM mag/arcsec2 |
|---|---|---|
| 1 | Excellent dark-sky site | 21.7–22.0 |
| 2 | Typical truly dark site | 21.5–21.7 |
| 3 | Rural sky | 21.3–21.5 |
| 4 | Rural/suburban transition | 20.4–21.3 |
| 5 | Suburban sky | 19.1–20.4 |
| 6 | Bright suburban sky | 18.0–19.1 |
| 7 | Suburban/urban transition | |
| 8 | City sky | < 18.0 |
| 9 | Inner-city Sky | |

Source: Bortle, John E. 2001. Gauging Light Pollution: The Bortle Dark-Sky Scale. Sky & Telescope. Sky Publishing Corporation. Accessed May 29, 2020. https://skyandtelescope.org/astronomy-resources/light-pollution-and-astronomy-the-bortle-dark-sky-scale/.

mag/arcsec$^2$ = magnitudes per square arcsecond; SQM = Sky Quality Meter

**Examples of Typical Illuminance and Apparent Magnitude**

| Location | Classification | Illuminance[(a)] (lux) | Sky Brightness[(b)] (mag/arcsec$^2$) |
|---|---|---|---|
| Outdoor | Bright Sun | 100,000–130,000 | >0.1 |
| | Hazy Day | 32,000 | 1.3 |
| | Partly Cloudy | 25,000 | 1.6 |
| | Cloudy | 10,000 | 2.6 |
| | Overcast | 1,000 | 5.1 |
| | Sunrise/Sunset on Clear Day | 400 | 6.1 |
| | Full Moon | 0.1 | 15.1 |
| | Moonless Clear Night Sky | 0.001 | 20.1 |
| | Moonless Overcast Night Sky | 0.0001 | 22.6 |
| | Starlight | 0.00005 | 23.3 |

**Examples of Typical Illuminance and Apparent Magnitude**

| Location | Classification | Illuminance[(a)] (lux) | Sky Brightness[(b)] (mag/arcsec$^2$) |
|---|---|---|---|
| Indoor | Typical TV Studio | 1,000 | 5.1 |
| | Bright Office with Large Contrast | 400 | 6.1 |
| | Hall Way | 80 | 7.8 |
| | Living Room | 50 | 8.3 |
| | Good Street Lighting | 20 | 9.3 |
| | Poor Street Lighting | 1 | 12.6 |

Notes:
(a) G. R. Elion and H. A. Elion, 1979. Electro-Optics Handbook. CRC Press.
(b) Calculated based on conversion from lux to mags/arcsec$^2$
mag/arcsec$^2$ = magnitudes per square arcsecond; lux = luminous flux per unit area

**APPENDIX 3.10-2**

# SWCA 2022 Visual Impact Assessment Report

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# Horse Heaven Wind Farm Project Final Visual Impact Assessment Report

**APRIL 2022**

PREPARED FOR

**Washington Energy Facility Site Evaluation Council (EFSEC)**

PREPARED BY

**SWCA Environmental Consultants**

# HORSE HEAVEN WIND FARM PROJECT
# FINAL VISUAL IMPACT ASSESSMENT REPORT

Prepared for

**Washington Energy Facility Site Evaluation Council (EFSEC)**
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SWCA Project No. 71229

April 2022

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# CONTENTS



## Attachments



## Tables

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# 1 INTRODUCTION

In February 2021, the Washington Energy Facility Site Evaluation Council (EFSEC) received an Application for Site Certification (ASC) from Horse Heaven Wind Farm, LLC (the Applicant) proposing the construction and operation of the Horse Heaven Wind Farm Project (Project or Proposed Action). The ASC proposes the construction of a renewable energy generation facility that would have a nameplate energy generating capacity of up to 1,150 megawatts for a combination of wind and solar facilities as well as battery energy storage systems (BESSs). The 72,428-acre Lease Boundary is located on the Horse Heaven Hills south of Richland, Kennewick, and Benton City and is comprised mostly of private lands with some Washington Department of Natural Resources state trust parcels. The Project design includes the following components:

- Two wind turbine layout options
- Three potential solar array siting areas
- Up to five substations and associated transmission lines
- Three potential BESS locations
- An operation and maintenance (O&M) facility
- Other Project supporting infrastructure as depicted in Figures 1 and 2 in Attachment A

Additional details regarding the Project design are located in the Project ASC (Horse Heaven Wind Farm, LLC 2021a).[1]

The purpose of this report is to assist in EFSEC's determination of potential Project impacts under the Washington State Environmental Policy Act (SEPA), including significant unavoidable adverse impacts. Specifically, the report focuses on potential visual impacts resulting from modification of the landscape as well as the response of viewers to those features. Additionally, this report analyzes whether the Project would be consistent with and comply with state and local visual resource guidance. The information contained in this report was provided by the Applicant and supplemented with publicly available data where necessary. No additional fieldwork or simulations (beyond those provided in the ASC) were completed.

# 2 REGULATORY FRAMEWORK

The EFSEC process does not require a particular visual resource analysis method to be used. Instead, the goal is to describe the aesthetic impact of the proposed Project, provide the location and design of the facilities, depict how the Project will appear relative to the surrounding landscape, and describe procedures to restore or enhance the landscape disturbed during construction.

Both Washington State and the Benton County Comprehensive Plan provide guidance with regard to visual resources. As part of the EFSEC process, Washington Administrative Code 463-60-362(3) identifies the following standard for analysis of visual resource (aesthetics).

[1] The ASC can be viewed at the following website: Horse Heaven Application | EFSEC - The State of Washington Energy Facility Site Evaluation Council.

- The application shall describe the aesthetic impact of the proposed energy facility and associated facilities and any alteration of the surrounding terrain. The presentation will show the location and design of the facilities relative to the physical features of the site in a way that will show how the installation will appear relative to its surroundings. The applicant shall describe the procedures to be utilized to restore or enhance the landscape disturbed during construction (to include temporary roads).

Benton County has adopted planning goals and policies in their Comprehensive Plan (Benton County 2021) to conserve areas of potential value to the county and its residents. The following planning goals and policies noted below are most applicable to this visual analysis:

- PL Goal 3: Conserve visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape and are uniquely a product of the ice age floods.
    - Policy 4: Consider the preservation of the ridges and hillside areas through various development regulations.

These county goals and policies provide the intentions and interests of Benton County, rather than providing specific compliance requirements for this Project. No other federal, state, or local visual management requirements were identified for Project compliance.

The February 2021 Project ASC included a visual inventory and analysis within Section 4.2.3 (Horse Heaven Wind Farm, LLC 2021a), with an additional report submitted in October 2021 titled *Aesthetics Technical Memorandum for the Horse Heaven Wind Farm Project* (Horse Heaven Wind Farm, LLC 2021b). This memorandum, serving as the Applicant's visual analysis, focused mostly on the Visual Resource Management (VRM) System from the Bureau of Land Management (BLM), which has become an industry standard to analyze potential visual impacts, particularly in the western United States, and is often applied to projects on non-BLM lands. The BLM VRM as well as other federal agency visual resource methodologies (e.g., U.S. Forest Service scenery management system and U.S. Federal Highway Administration Guidelines for the Visual Impact Assessment of Highway Projects) have three common elements. These include

- Scenery: continuous units of land comprised of harmonized features that result in and exhibit a particular character,
- Views (sensitivity to visual change and visibility): public viewing locations including recreation areas, travel routes, residences, and lands with special management where viewers have sensitivity to landscape changes, and
- Agency visual management requirements: which identify allowable levels of change to landscape character and the allowable degree of attention the project could attract from viewing locations.

The application of the BLM VRM system in the Applicant's visual analysis document (Horse Heaven Wind Farm, LLC 2021b) did not include some elements typically required, including the completion of contrast rating worksheets from key viewpoints or consideration of all 10 BLM contrast factors. Of these 10 factors, the Applicant's visual analysis did not address the effect of motion and its influence on both landscape character and views. This report builds on the BLM VRM analysis provided in the ASC, including the effects of motion, and incorporates elements from *A Visual Impact Assessment Process for Wind Energy Projects* from the Clean Energy States Alliance (CESA) (CESA 2011) to evaluate and address the unique visual characteristics of wind energy projects. These combined methods are described further in Section 3 of this report.

# 3 AFFECTED ENVIRONMENT

To describe the Project's affected environment, this section outlines the inventory methods, describes the existing landscape character, and identifies potential viewing locations.

## 3.1 Inventory Methods

The visual resource area of analysis was identified in the ASC as the area within 10 miles of the proposed wind turbines and transmission line and within 5 miles of the proposed solar arrays, substations, and BESSs. Based on guidance from both the BLM (Sullivan et al. 2012) and CESA (2011), the area of analysis for the wind turbines was extended to 25 miles.

The visual resource inventory and impact assessment focused on three elements: landscape character, viewing locations, and compliance with state and county visual management guidance. These concepts are included both in the BLM VRM system and CESA process to identify potential impacts on visual resources. The methods for determining landscape character and viewing locations are described in the subsequent sections. Compliance with state and county visual management guidance (Section 2) is addressed in Section 4.2.2.6.

## 3.2 Existing Landscape Character

The term landscape character is used to describe the overall visual appearance of a given landscape, based on the visual aspects of the landscape's vegetation, landforms/water, and human-made modifications. Landscape character is often described in terms of landscape character areas, which are portions of a larger landscape that share harmonizing features that result in and exhibit a particular visual character.

The Project is located within the Columbia Plateau U.S. Environmental Protection Agency (EPA) Level III ecoregion (EPA 2010), which is typically characterized by a broad expanse of sagebrush-covered volcanic plains and valleys adjacent to the Columbia River and dotted with isolated mountains. There are landscape features in the area of analysis associated with a series of cataclysmic floods that occurred at the end of the most recent ice age, when glacially dammed lakes ruptured and large volumes of water rushed through the northwestern United States (National Park Service 2014).

The Lease Boundary is primarily characterized by the following features:

- Flat to rolling panoramic landscapes comprised of arid sagebrush steppe and grasslands that have been partially converted to agricultural lands.
- Topography gently slopes from north to south with a distinctive ridge located north of the Lease Boundary that connects the elevated sagebrush steppe to the Columbia River Valley.
- There are a series of minor drainageways that dissect the landscape with some forming small canyon settings.
- Due to the arid climate, there are limited trees within the Lease Boundary. Most trees visible in the Lease Boundary are associated with ornamental landscaping and windbreaks adjacent to residences, with the primary vegetation communities being agricultural lands with areas of remnant sagebrush steppe and grassland.
- Vegetation color in agricultural areas ranges from green to tan and brown depending on the season and the crop being grown. More vivid colors occur along the Columbia River Valley

associated with residential, commercial, and agricultural development that contrasts with the arid, muted colors found within the Lease Boundary.

The inventory of existing landscape character, based on CESA guidance, also considered the intactness of the landscape. This relates to the extent of modifications present in the existing landscape and their overall effect on natural patterns, which define the landscape. These modifications have the potential to create unintended focal points contrasting with the natural landscape character. There are three main landscape character areas that define the Lease Boundary's landscape character:

- **Plateau lands west of I-82:** The arid, rolling plateau lands west of the interstate are mostly intact with limited existing utility or other industrial uses. An existing transmission line traverses the western edge of the Lease Boundary, influencing the adjacent setting. There are also residences dispersed across this rural agricultural landscape, introducing geometric structures and additional vegetation in the setting associated with wind breaks and ornamental landscaping. The juxtaposition of residences and agricultural lands, including barns and other structures, create an agrarian landscape character common to the region.
- **Plateau lands east of I-82:** The landscape east of the interstate is similar to the western area but includes a series of wind turbine strings associated with the existing Nine Canyon Wind Project. There is also an existing transmission line that crosses the Lease Boundary near the west side of the existing Nine Canyon Wind Project and along the southern edge of the Lease Boundary adjacent to I-82. The influence of the existing landscape modifications extends throughout this landscape, reducing its level of intactness. The tall vertical form of the existing wind turbines and their movement attract attention within the setting, generally dominating the local landscape character.
- **Ridgeline:** This landscape is most prominent east of I-82 but continues to the west as a connection between the flat lands adjacent to the Columbia River and the elevated steppe lands. Due to the steep terrain, this area is visually prominent as viewed from the communities located north of the Lease Boundary. There are multiple paragliding launch sites along the ridge including Jump Off Joe, M&M Ridge, and Kiona. Additionally, there are two strings of the existing Nine Canyon Wind Project sited along the ridge and a communication tower, which reduce the intactness of the setting east of I-82.

## 3.3 Viewing Locations and Key Observation Points

While landscape character is focused on the visual characteristics of the overall landscape regardless of specific viewing locations, visibility of the Project from typical or sensitive viewing locations represent the most critical places from which the public would view the Project. These are commonly referred to as key observation points, or KOPs, and establish the platforms where impacts on views are assessed. KOP locations include static locations, such as residential areas, where views would occur from a consistent location, as well as linear KOPs, such as travel ways, where views change based on moving along a road or trail with varying potential impact levels.

In order to identify these KOP locations, a series of bare-earth viewshed analyses were run to depict the visibility of the Project from the surrounding area. The bare-earth modeling approach used in the viewshed analysis does not account for screening effects from vegetation or buildings that could block or partially block some views. In this manner, the bare-earth viewshed approach results in a conservative assessment of potential Project visibility. The analysis in the ASC included six viewsheds to compare visibility of the two turbine layout options, identify visibility of the three solar array siting areas, and provide visibility of the proposed transmission lines (Horse Heaven Wind Farm, LLC 2021b). These viewsheds were run out to the different areas of analysis associated with each of the Project components

as described in Section 3.1. Based on the expansion of the area of analysis for the wind turbines from 10 miles to 25 miles, the viewsheds associated with the two turbine layout options were updated for this report to include this larger, regional setting. See Figures 3 through 8 in Attachment A for the results of these viewshed analyses.

Within the Applicant's visual resources area of analysis, results of the viewshed analyses and aerial photography were used to identify possible residential structures, travel ways, cultural resources with visual aspects, recreation, and other areas of interest including open space areas, to identify potential KOPs. These KOPs represent critical viewpoints, typical views in representative landscapes, and views of any special Project features. Additionally, the Applicant sought input from Benton County to identify potential areas of interest to local community members. Benton County noted interest on the part of residents located north of the Project. This area of interest contains a large number of residences as well as a series of parks and other recreation areas. The resulting list of potential KOPs were visited and photographed, and a series of KOPs were identified for analysis to represent the range of viewers and locations that would have views of the proposed Project infrastructure. In addition to these Applicant-selected KOP locations, supplementary viewing locations were considered to represent views from dispersed residences located directly adjacent to the proposed wind turbines and views from Horse Heaven Hills, a BLM-managed dispersed recreation area (BLM 2022).

Viewer reactions to changes in the landscape (viewer sensitivity) can vary depending on the characteristics and preferences of the viewer group. For example, residential viewers are typically expected to have a high concern for changes in views from their residences. These preferences may also vary depending on if the residential viewer is a Project participant or if views are from a non-participating property. Motorists' concern generally depends on when and where travel occurs, and the type of travel involved (e.g., commuting vs. recreational travel). Recreation users' concern for changes in views varies based on the activities occurring and how long viewers would have to analyze the landscape (view duration). For example, viewers at a scenic overlook would have a higher concern for changes in view, where the landscape would be viewed for a long duration and is integral to its use, compared to other recreation uses (e.g., birding) where the landscape is viewed for a shorter duration and is not the focus of the recreation activity.

The types of users in the visual study areas include residents of the adjacent Tri-Cities communities, including Benton City, Burbank, Kennewick, Pasco, Richland, West Richland, Finley, and Prosser; travelers on the various interstates and highways; recreators visiting the Rattlesnake, Red, Candy, and Badger mountains, McNary National Wildlife Refuge, and other recreational facilities in the area. Lands within the Lease Boundary are also of interest to the Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Umatilla Indian Reservation, and Nez Perce Tribe, who may attach cultural significance to natural landscape components.

The distance from the Project is a key factor in determining potential visual effects, with the amount of perceived contrast generally diminishing as distance between the viewer and the affected area increases (BLM 1986). Contrast is defined as the level of visible change to the existing features of the landscape (including landform/water, vegetation, and human-made structures) resulting from the introduction of a proposed project or management activity. The BLM VRM system and other visual resource systems establish a series of distance zones to identify visibility thresholds and inventory the existing landscape. For the purposes of this study, the distance to the Project (in miles) was used to identify viewing distance, with a particular focus on the foreground distance zone. This area corresponds to the area within 0.5 mile of the Project, where views of modifications in the landscape would be most prominent leading to views potentially dominated by Project infrastructure.

The list of viewing locations and KOPs used in this analysis as well as the associated viewer type, viewer sensitivity, and distance to the Project are presented in Table 1 and depicted on Figure 9 in Attachment A.

**Table 1. Key Observation Point Locations Table**

| KOP Number | Viewer Name | Viewer Type | Viewer Sensitivity | Distance to Project | Description |
|---|---|---|---|---|---|
| 1 | McNary National Wildlife Refuge (NWR) | Recreation | Moderate | 5.2 miles (wind turbines)<br>Solar arrays, transmission lines, and substations/ BESSs would not be visible from this location. | Viewpoint is located along an unpaved road within the McNary NWR, looking southwest across the Columbia River towards the Project Lease Boundary. |
| 2 | S Clodfelter Road – East, Central, and West | Residential | High | 3.0 miles (wind turbines)<br>3.4 miles (transmission line)<br>Solar arrays and substations/BESSs would not be visible from this location. | Viewpoint is located along the south side of Manuel Drive, toward S. Clodfelter Road, looking southeast to southwest. |
| 3 | Chandler Butte | Recreation | High | 2.5 miles (wind turbines)<br>2.1 miles (solar array)<br>4.2 miles (transmission line)<br>The substations/BESSs would be visible from this location but would be outside of the photo frame. | Viewpoint is located along the unpaved road east of the communication towers, looking southeast. |
| 4 | I-82 South | Travel route | Moderate | 7.0 miles (wind turbines)<br>6.0 miles (solar array)<br>6.5 miles (transmission line)<br>The HH-East Substation/ BESSs would be visible from this location. | Viewpoint is located along the right shoulder of the highway, looking northwest to northeast. |
| 5 | Badger Mountain | Recreation | High | 4.7 miles (wind turbines)<br>Solar arrays, transmission lines, and substations/ BESSs would not be visible from this location. | Viewpoint is located along the southern side of the top of Badger Mountain looking southwest. |
| 6 | Bofer Canyon Road/I-82 | Travel route | Moderate | 1.7 miles (wind turbines)<br>0.6 mile (solar array)<br>1.2 miles (transmission line)<br>The HH-East Substation/ BESSs would be visible from this location but would be outside of the photo frame. | Viewpoint is located along the right shoulder of the road, looking north. |
| 7 | Highway 221 | Travel route, residential | High | 5.8 miles (wind turbines)<br>3.1 miles (solar array)<br>2.2 miles (transmission line)<br>The HH-West Substation/ BESSs would be visible from this location. | Viewpoint is located along the right shoulder of the highway, looking northeast. |

| KOP Number | Viewer Name | Viewer Type | Viewer Sensitivity | Distance to Project | Description |
|---|---|---|---|---|---|
| 8 | Kennewick (Canyon Lakes Area) – South and West | Residential | High | 3.6 miles (wind turbines)<br>5.9 miles (solar array)<br>7.4 miles (transmission line)<br>The substations/BESSs would not be visible from this location. | Viewpoint is located on the southwest end of S. Olson Street, looking west to south. |
| 9 | Benton City | Residential, travel route, commercial | High | 2.7 miles (wind turbines)<br>3.9 miles (solar array)<br>5.5 miles (transmission line)<br>The substations/BESSs would not be visible from this location. | Viewpoint is located on the east side of Division Street/State Route 225, looking south. |
| 10 | Badger Road | Residential, travel route | High | 1.5 miles (wind turbines)<br>6.4 miles (solar array)<br>4.3 miles (transmission line)<br>The substations/BESSs would not be visible from this location. | Viewpoint is located on the north side of Badger Road, looking southwest. |
| 11 | Highland/Finley Area | Residential | High | 2.0 miles (wind turbines)<br>8.5 miles (solar array)<br>8.7 miles (transmission line)<br>The substations/BESSs would not be visible from this location. | Viewpoint is located on the north side of E. Cougar Road near an entrance driveway to Finley Elementary School, looking southeast. |
| 12 | County Well Road | Residential, travel route | High | 2.5 miles (wind turbines)<br>0.2 mile (solar array)<br>0.2 mile (transmission line)<br>The HH-West (Alternative) Substation/BESSs would be visible from this location and located 0.5 mile away. | Viewpoint is located on the left shoulder of County Well Road, looking northeast. |
| 13 | Travis Road South of Sellards Road | Residential, travel route | High | 1.1 miles (wind turbines)<br>1.0 mile (solar array located outside of photo frame)<br>0.1 mile (transmission line)<br>The substations/BESSs would not be visible from this location. | Viewpoint is located on the right shoulder of Travis Road, looking north. |
| N/A | Dispersed residences located 0.5 mile from proposed turbines (foreground views) | Residential | High | Less than 0.5 mile (wind turbines)<br>The other Project component distances would vary but are more specifically described from other KOP locations. | There are approximately 14 residences located within the foreground distance zone of the proposed wind turbines, less than 0.5 mile, with three of those identified as non-Project participating properties. Additionally, there are numerous residences located within 0.5 to1 mile of the proposed wind turbines. |
| N/A | Horse Heaven Hills Recreation Area | Recreation | Moderate | 0.8 mile (wind turbines)<br>Solar arrays, transmission lines, and substations/ BESSs would not be visible from this location. | Dispersed recreation including opportunities for hiking, nature viewing, and mountain biking with potential views of the Project to the south. |

A series of visual simulations were prepared from KOPs 1 through 13, with both wind turbine options depicted, and are included in Attachment B. No simulations were developed from either of the un-numbered KOP viewing locations (e.g., Horse Heaven Hills Recreation Area or dispersed residences within foreground distance zone). Existing condition photographs were taken using standard focal lengths to most closely represent the human field of view. In order to create photographic simulations, a three-dimensional model of the turbine, solar array, and transmission line layouts were placed in the photographic view, taking into consideration Project topography (elevation) and distance from the observation point. Simulated turbines, solar arrays, and transmission lines were aligned to the photographs and the model rendered and composited to create the visualizations. Some of the KOP locations have multiple simulations looking in different directions, such as KOP 2, which includes potential views of the Project to both the southeast and southwest (Horse Heaven Wind Farm, LLC 2021b).

# 4 IMPACT ASSESSMENT

## 4.1 Method of Analysis

The Project visual analysis focuses on three elements: landscape character, viewing locations, and compliance with state and county visual management guidance. The CESA methods suggest three evaluation criteria as they relate to identifying if impacts rise to the magnitude of "undue" or "unreasonable" (CESA 2011):

- Does the project violate a clear written aesthetic standard intended to protect the scenic values or aesthetics of the area or a particular scenic resource?
- Does the project dominate views from highly sensitive viewing areas or within the region as a whole?
- Has the developer failed to take reasonable measures to mitigate the significant or avoidable impacts of the project?

Table 2 outlines the SEPA impact rating factors used for this visual impact assessment, including magnitude, duration, likelihood, and spatial extent of impacts. Table 3, in consideration of BLM and CESA methods, further describes the degrees of magnitude in Table 2 (negligible, low, medium, and high), as they relate to the visual impact analysis elements that form the foundation of this assessment. As identified in Table 3, the determination of impact magnitude is based on impacts to landscape character, impacts to viewing locations, and compliance with state and county visual resource requirements. These determinations are primarily focused on the concept of project contrast, which is a measure of the overall visual changes to existing features of the landscape (including landform/water, vegetation, and human-made structures) resulting from the construction, operation, and decommissioning of a project. The level of project contrast is assessed using the categories of slight, weak, moderate, and strong, which directly align with the magnitude of change degrees of negligible, low, medium, and high.

Other concepts from the CESA methods were included to evaluate and address the unique visual characteristics of wind energy projects. For the assessment of impacts on landscape character, this includes modifications to the existing setting, which may reduce the setting's overall level of intactness. With regard to impacts on views, the concepts of project dominance, prominence with the setting, and the extent of viewshed occupied by the project (i.e., extent of horizontal view occupied by Project) were included from the CESA methods. These concepts build upon the BLM VRM's 10 environmental factors that influence the amount of visual contrast introduced by a project (BLM 1986):

- Distance

- Angle of observation
- Length of time the project is in view
- Relative size or scale
- Season of use
- Lighting conditions
- Recovery time
- Spatial relationships
- Atmospheric conditions
- Motion

Of particular importance for a project with wind turbines is the influence of motion to attract attention and increase the level of visual contrast within view, compared to static elements (e.g., solar arrays, transmission lines).

**Table 2. Impact Rating**

| Factor | Rating | | | |
|---|---|---|---|---|
| **Magnitude** | Negligible<br>*indistinguishable from the background* | Low<br>*Small impact, non-sensitive receptor(s)* | Medium<br>*intermediate impact, may occur on sensitive receptor(s) or affect public health and safety* | High<br>*high impact on sensitive receptor(s) or affecting public health and safety* |
| **Duration** | Temporary<br>*infrequently during any phase* | Short-term<br>*duration of construction or site restoration* | Long-term<br>*during operation or operation plus another phase of Project* | Constant<br>*during life of Project and/or beyond the Project* |
| **Likelihood** | Unlikely<br>*not expected to occur* | Feasible<br>*may occur* | Probable<br>*expected to occur* | Unavoidable<br>*inevitable* |
| **Spatial Extent/Setting** | Limited<br>*small area of Lease Boundary or beyond Lease Boundary if duration is temporary* | Confined<br>*within Lease Boundary* | Local<br>*beyond Lease Boundary to neighboring receptors* | Regional<br>*beyond neighboring receptors* |

**Table 3. Criteria for Assessing Magnitude of Impacts to Visual Resources**

| Magnitude of Impacts | Description |
|---|---|
| Negligible | **Landscape character:** landscape would appear unaltered and Project components would not attract attention. Project components would repeat form, line, color, texture, scale and/or movement common in the landscape and would not be visually evident.<br>**Viewing locations:** contrast introduced by the Project would be slight and would be subordinate to existing landscape features and would not be readily seen from viewing locations. Project components would repeat elements or patterns common in the landscape.<br>**State and county visual resource requirements:** Project would be consistent with state and county visual management requirements. |

| Magnitude of Impacts | Description |
|---|---|
| Low | **Landscape character:** landscape would be noticeably altered, and Project components would begin to attract attention in a partially intact visual setting. Project components would introduce form, line, color, texture, scale, and/or movement common in the landscape and would be visually subordinate (weak contrast).<br>**Viewing locations:** A weak level of contrast would be introduced by the Project. The Project would occupy a small portion of the viewshed, and would be subordinate to existing landscape features, as seen from viewing locations.<br>**State and county visual resource requirements:** Project would be consistent with state and county visual management requirements after implementation of mitigation measures. |
| Medium | **Landscape character:** landscape would appear to be considerably altered and Project components would begin to dominate a partially intact visual setting. Project components would introduce form, line, color, texture, scale, and/or movement not common in the landscape and would be visually prominent in the landscape (moderate contrast).<br>**Viewing locations:** a moderate level of contrast would be introduced by the Project, attracting attention from viewing locations. The Project would be prominent in the existing landscape and co-dominate from viewing locations where the form, line, color, texture, scale, and/or movement of Project components would be moderately incongruent with existing landscape features.<br>**State and county visual resource requirements:** Project would be partially consistent with state and county visual management requirements, and the implementation of mitigation measures would not sufficiently reduce impacts. |
| High | **Landscape character:** landscape would appear to be strongly altered and Project components would dominate an intact visual setting. Project components would introduce form, line, color, texture, scale, and/or movement not common in the landscape and would be visually dominant in the landscape (strong contrast).<br>**Viewing locations:** a strong level of contrast would be introduced by the Project, demanding attention. The Project would be highly prominent and dominate views from viewing locations where the form, line, color, texture, scale, and/or movement of Project components would be highly incongruent with existing landscape features, including existing structures. A strong level of contrast may also be introduced if the Project components occupy a large portion of the viewshed from a given viewpoint.<br>**State and county visual resource requirements:** Project would be inconsistent with state and county visual management requirements, and the implementation of mitigation measures would not sufficiently reduce impacts. |

To support the visual impact discussions, the following visual terminology is used in this report as defined below:

- Viewer position (angle of observation)
  - Inferior: viewer is located below the Project in elevation.
  - Level: viewer is at the same elevation as the Project.
  - Superior: viewer is located above the Project in elevation.
- Project visibility factors
  - Screening: an existing visual barrier (landforms, vegetation, or structures) blocks or limits views of the Project, reducing the level of contrast introduced by the Project.
  - Unobstructed: views of the Project would not be screened by landforms, vegetation, or structures allowing for the extent of the Project to be visible.
  - Skylining: the Project would appear above the horizon or ridgeline, silhouetting its form against the sky attracting additional attention in the landscape.
  - Backdropping: distant hills or mountains would appear behind the Project potentially reducing contrast introduced by its form, line, color, and texture as those elements would appear to blend with the existing setting.

Since impacts on visual resources considered effects on scenery and on views from multiple KOPs, the summary impact level (i.e., magnitude of impact) at the end of each discussion focuses on the highest identified impacts.

# 4.2 Impacts of Proposed Action

## *4.2.1 Impacts during Construction*

The construction of the Project would introduce form, line, color, texture, scale, and movement inconsistent with the existing landscape character and would modify views from the identified KOP locations. These short-term impacts would result from the construction of Project facilities as well as construction of new access roads and associated vegetation clearing. Because the Applicant has committed to active dust suppression, as described in Section 1.10 Mitigation Measures of the ASC, potential visual impacts associated with visible dust plumes is not considered in this assessment. Impacts associated with Project lighting or glare is considered in the draft environmental impact statement for the Project. The following sections describe visual/aesthetic impacts associated with the different Project components.

### 4.2.1.1 TURBINE OPTION 1

Impacts on visual resources would be elevated during construction activities, including the movement of vehicles that would attract attention, due to increased activity at proposed temporary staging areas and throughout the Lease Boundary. The construction of access roads, crane paths, collector and communication lines, and the wind turbines would be prominent when viewed within the foreground distance zone (0–0.5 mile) and would begin to modify the existing landscape setting.

During construction, the removal of vegetation and earthwork would introduce areas of exposed soil, which would contrast with the existing setting until vegetation is later reclaimed. The construction of access roads in the level to rolling terrain in the analysis area would require minimal modification of the existing terrain, resulting in negligible long-term visual impacts. Impacts common to all KOPs during construction would include views of additional vehicular traffic and areas of exposed soil after the removal of vegetation and during earthwork activities. Viewers located within the foreground distance zone (0–0.5 mile), or in locations where views would be occupied by a large portion of the Project under construction, would result in increased visual contrast on these views.

These impacts would be most intense during the 23-month construction schedule (as described in the ASC and in Chapter 2 of the draft environmental impact statement for the Project) and would diminish after construction is complete and vegetation has been re-established. Following the initial seeding, completed after construction, the Applicant would continue to monitor these revegetation areas for 3 to 5 years and apply remedial actions in order to meet the success criteria outlined in Appendix N of the ASC (Horse Heaven Wind Farm, LLC 2021a). Construction activities for Turbine Option 1 would result in medium, short-term, probable, local impacts on visual resources.

### 4.2.1.2 TURBINE OPTION 2

Impacts would be similar to Turbine Option 1. Because there are fewer proposed wind turbines requiring less ground disturbance for construction, there would be a reduced level of contrast and fewer modifications to the existing landscape character introduced during Project construction when compared to Turbine Option 1. However, the ratings of impacts are consistent between the two turbine options as construction of either option would occupy a large portion of the landscape contrasting with its existing character. Construction activities for Turbine Option 2 would result in medium, short-term, probable, local impacts on visual resources.

#### 4.2.1.3 SOLAR ARRAYS

The construction of the solar arrays would result in similar impacts as the wind turbines but would occur within a smaller, more defined area associated with the selected solar array site. Within the fenced boundary, all lands would be distributed through earthwork, vegetation clearing, and other construction efforts. Application of mitigation measures would reduce these impacts to the extent practicable to minimize these short-term visual impacts as described in Section 4.2.4. Construction activities for the solar arrays would result in low, short-term, probable, local impacts on visual resources.

#### 4.2.1.4 SUBSTATIONS

Impacts from construction of the substations would be similar to the solar arrays, with the addition of multiple linear transmission lines connecting the proposed substations to the existing electrical grid. The construction of the transmission lines would include vegetation clearing within the right-of-way and construction of a series of tall, vertical structures. During construction, the motion associated with construction equipment, structure building, and conductor stringing, as well as vegetation clearing and landform modification would be noticeable and create visual contrast within the viewshed. Construction activities for the substations and transmission lines would result in low, short-term, probable, local impacts on visual resources.

#### 4.2.1.5 BATTERY ENERGY STORAGE SYSTEMS

Impacts would be similar to the proposed solar arrays and substations, with these proposed BESS sites located adjacent to the proposed substation locations. The construction of the BESSs would introduce additional motion from construction equipment into the setting. Additionally, the removal of vegetation and earthwork would introduce areas of exposed soil, which would contrast with the existing setting until vegetation has been restored. Construction activities for the BESSs would result in low, short-term, probable, local impacts on visual resources.

#### 4.2.1.6 COMBINED IMPACTS OF COMPONENTS

During the 23-month construction schedule, there would be short-term impacts from construction activities occupying a large portion of the landscape when considering all of the Project components (i.e., wind turbines, solar arrays, collector lines, access road, multiple transmission lines and substations, O&M facility, and the BESSs). This would include views of additional vehicular traffic as well as areas of exposed soil after the removal of vegetation and during earthwork activities. The removal of vegetation would be noticeable in the setting and contrast with the existing character; however, over time, after vegetation is reclaimed in temporary disturbance areas, it would begin to repeat vegetation patterns common in the area.

Viewpoints and KOPs located within the foreground distance zone (0–0.5 mile) would be most impacted by the construction of multiple Project components, particularly when a large portion of their viewshed is occupied by construction activities. These short-term impacts are anticipated to extend beyond the neighboring receptors, resulting in potential regional impacts from more distant viewpoints where construction activities would occupy a large portion of their viewshed. Construction disturbance would be limited to the extent practicable in accordance with best management practices (BMPs) and the Project's site certificate conditions. After construction is completed, areas of temporary disturbance, including temporary access roads no longer used as Project access roads, would be reclaimed to appear similar to their original condition. In general, vegetated areas that are temporarily disturbed or removed during construction of the Project would be revegetated to blend with adjacent undisturbed lands with these areas being monitored for 3 to 5 years postconstruction to meet a series of success criteria outlined in the

Project's Revegetation and Noxious Weed Management Plan (Horse Heaven Wind Farm, LLC 2021a: Appendix N). Areas with soil compaction and disturbance from construction activities would also be revegetated in accordance with the Project's Revegetation and Noxious Weed Management Plan.

In summary, activities during construction of all components of the Project would result in medium, short-term, probable, regional impacts on visual resources.

## 4.2.2 Impacts during Operation

The introduction of the Project into the setting would result in long-term modifications to the existing landscape's form, line, color, and texture, and would modify views from the identified KOP locations to varying degrees. Although impacts would depend on a variety of viewing conditions, one overall concept to note is that the visual impacts associated with the Project tend to change considerably with distance. These effects would be most impactful on residential, travel route, and recreation viewers located within the foreground distance zone (0–0.5 mile), where the Project would create strong vertical and horizontal forms and lines that would contrast with the primarily organic forms of the existing setting. There are 13 residences located on non-participating properties that would have foreground views (less than 0.5 mile) of either the proposed turbines or solar arrays.

Impacts on views from the middleground (0.5–5 miles) would vary based on the extent of existing modifications in view. For locations with views of the existing Nine Canyon Wind Project, or where the existing transmission lines dominate the existing view, the Project would typically result in medium impacts and would be viewed as co-dominant within the existing setting. From viewpoints where existing modifications do not currently attract attention, the Project would dominate views since a large portion of the viewshed would typically be occupied by large, spinning wind turbines. From this distance, the individual turbines tend to visually "merge" with other turbines in the string from some viewing angles, resulting in the turbines appearing larger in mass and scale.

From more distant views, within the background distance zone (more than 5 miles away), the proposed wind turbines would appear as vertical lines with a faint spinning motion of the blades—particularly where seen skylined above ridges or other highpoints within the landscape. The proposed solar arrays and other Project components would be mostly indiscernible from the background distance zone.

### 4.2.2.1 TURBINE OPTION 1

Under Turbine Option 1, impacts to landscape character would range from high to medium. The Project would generally dominate the existing landscape character through the introduction of a large number of vertical protrusions that would be out of scale with and highly prominent in the landscape. The turbines would be most prominent where sited near the Horse Heaven Hills ridgeline, resulting in high impacts on landscape character. These structures would also introduce spinning movement into the landscape, which would attract attention throughout the area of analysis—particularly where the existing Nine Canyon Wind Project is not visible. Impacts to landscape character would be medium near the existing Nine Canyon Wind Project since this portion of the landscape—particularly the area east of I-82—has already been modified. In general, the existing level of landscape intactness would be diminished, resulting in landscapes characterized by energy generation, compared to the existing agrarian landscape character.

Impacts on key views would range from high to medium. Table 4 provides an overview of the impacts from each KOP/viewpoint, and includes the viewer position, the extent of the horizontal view occupied by the Project, the level of contrast, and the magnitude of impact.

In summary, activities during operation of Turbine Option 1 would result in areas of high, long-term, unavoidable, regional impacts on visual resources.

#### 4.2.2.2 TURBINE OPTION 2

The Project, under Turbine Option 2, would have similar high impacts on landscape character as Option 1. There would be fewer structures introduced into the setting under this option, which would result in less visual clutter, however, due to the increased height of the structures in Option 2, these effects would be balanced, resulting in overall similar effects. The additional height of Option 2 turbines would be more prominent near the Horse Heaven Hills ridgeline or adjacent to existing landscape modifications where the increased vertical forms would be most evident.

Table 5 describes the impacts on views from the KOPs and other viewing locations associated with Turbine Option 2. In summary, activities during operation of Turbine Option 2 would result in areas of high, long-term, unavoidable, regional impacts on visual resources.

**Table 4. Key Observation Point/Viewpoint Impact Table – Turbine Option 1**

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 1 | McNary NWR | Recreation | 5.2 miles | Inferior | 80 degrees | Moderate | Medium | The tall, proposed turbines would be similar in appearance to the existing Nine Canyon Wind Project, also visible from this location, but the proposed turbines would be larger and out of scale with the existing landscape. Views would be unobstructed toward the Lease Boundary. The prominence of the proposed wind turbines rising above the landscape, including additional motion introduced by the spinning turbine blades, would further attract attention from viewers and dominate the existing landscape character. Because visitors and travelers would be visiting for a limited time, the level of contrast would be reduced by the short view duration limiting the influence of the Project on these views. The Project would expand the extent of view occupied by moving wind turbines and would be prominent from this inferior viewing angle, resulting in medium, long-term impacts on views. |
| 2 | S Clodfelter Road – East, Central, and West | Residential | 3.0 miles | Inferior | 200 degrees | Strong | High | The proposed turbines would dominate views from this location, approximately 3 miles away, as a large portion of the viewshed would include moving wind turbines. Views of the Project in open, rolling hills would be unobstructed. Views toward the east would include the existing Nine Canyon Wind Project, which occupies only a narrow portion of the landscape as viewed from this location. The series of proposed skylined wind turbines would be highly prominent in the view, resulting in high, long-term impacts on views, particularly where views of multiple wind turbines would overlap and appear larger in mass. |
| 3 | Chandler Butte | Recreation | 2.5 miles | Superior | 50 degrees | Strong | High | The proposed turbines would dominate views from this location, approximately 2.5 miles away, as a moderate portion of the viewshed would include moving wind turbines. Views of the Project in an open plains landscape would be unobstructed, with views of the existing Nine Canyon Wind Project occurring approximately 20 miles away on the distant hills. Due to the superior viewing angle, the contrast between the light color of the turbines and the darker color of the ground would create strong visual contrast, visible to recreationists along Chandler Butte. The series of proposed wind turbines would be highly prominent in the view resulting in high, long-term impacts on views, particularly where views of multiple wind turbines would overlap and appear larger in mass. |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 4 | I-82 South | Travel route | 7.0 miles | Inferior | 100 degrees | Moderate | Medium | The proposed turbines would attract attention from this location, approximately 7 miles away, as a large portion of the viewshed would include moving wind turbines. Due to the distance, the turbine's form would be distinguishable, but the texture and color would be muted and less detailed. Views from I-82 include an existing transmission line and the Nine Canyon Wind Project, approximately 12 miles away, with these existing features influencing but not dominating views from this location. As travelers drive I-82 from this point to KOP 6, approximately 10 miles, impacts on views of the proposed wind turbines would incrementally increase. From this location, the turbines would be viewed unobstructed and skylined, which would attract attention—particularly where only moving turbine blades would be seen over the horizon. The impacts on these views would be medium and long term. |
| 5 | Badger Mountain | Recreation | 4.7 miles | Level | 150 degrees | Strong | High | The proposed turbines would dominate views from this location, approximately 5 miles away, as a large portion of the viewshed would include moving wind turbines. Views of the Project in open, rolling hills would be unobstructed, with views of the Project occurring beyond developed lands of Badger and the Horse Heaven Hills ridgeline. The series of proposed skylined wind turbines would be highly prominent in the view, resulting in high, long-term impacts on views—particularly where views of multiple wind turbines would overlap and appear larger in mass. |
| 6 | Bofer Canyon Road/I-82 | Travel route | 1.7 miles | Level | 120 degrees | Strong | High | The proposed turbines would be viewed in context with an existing transmission line from this KOP. The existing transmission line has introduced strong vertical lines into the existing setting. Due to the proximity of the proposed turbines (less than 2 miles), the introduction of movement into the landscape, and the extent of view occupied by these structures, the Project would dominate views from this location along Bofer Canyon Road and I-82. These impacts would continue to increase as viewers would pass the existing transmission line into an area where views of the proposed turbines would be highly prominent as viewed both to the east and west. Based on the landscape modifications introduced by the proposed wind turbines, the Project would result in high, long-term impacts on views. |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 7 | Highway 221 | Travel route, residential | 5.8 miles | Level | 70 degrees | Moderate | Medium | The proposed turbines would be viewed in context with a distant existing transmission line, which has introduced a series of skylined structures along the horizon. The proposed turbines would, however, appear larger and out of scale with the features of the existing landscape. Views would be unobstructed toward the Lease Boundary. The prominence of the proposed wind turbines rising above the landscape, including the introduction of motion, would further attract attention from viewers and modify the existing landscape character. The Project would be prominent within a moderate portion of the viewshed, resulting in medium, long-term impacts on views. |
| 8 | Kennewick (Canyon Lakes Area) – South and West | Residential | 3.6 miles | Inferior | 170 degrees | Strong | High | The proposed turbines would dominate views from this location, approximately 3.5 miles away, as a large portion of the viewshed would include moving wind turbines. Views of the Project in open, rolling hills would be unobstructed with views toward the west including an existing transmission line. Views to the southeast include the existing Nine Canyon Wind Project, which occupies a narrow portion of the landscape as viewed from this location. The series of proposed skylined wind turbines would be highly prominent in the view resulting in high, long-term impacts on views, particularly where views of multiple wind turbines would overlap and appear larger in mass. |
| 9 | Benton City | Residential, travel route, commercial | 2.7 miles | Inferior | 10 to 80 degrees (based on level of screening) | Moderate | Medium | The proposed wind turbines would be intermittently screened by development within Benton City, with partial screening of the Project features occurring where the Horse Heaven Hills would partially obstruct views to the south. Where visible, there would be a limited number of turbines in view, as depicted in the visual simulation (Attachment B). The presence and motion of the turbines would attract attention but would appear co-dominant with other commercial and residential developments. Views from other areas within the city may have more expansive, unobstructed views of the proposed wind turbines similar to KOPs 2 and 10. The Project would expand the extent of view occupied by moving wind turbines and would be prominent from this inferior viewing angle, resulting in medium, long-term impacts on views. |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 10 | Badger Road | Residential, travel route | 1.5 miles | Inferior | 150 degrees | Strong | High | The proposed turbines would dominate views from this location, approximately 1.5 miles away, as a large portion of the viewshed would include moving wind turbines. Views of the proposed wind turbines, from an inferior viewing angle, would be partially screened by topography and intermittently screened by development. Movement associated with the turbine blades would be highly visible, particularly where only the blades would visible, repeatedly rising over the hills. Based on the level of contrast introduced by the proposed wind turbines, which are much larger in scale than existing modifications in view, the Project would result in high, long-term impacts on views. |
| 11 | Highland/ Finley Area | Residential | 2.0 miles | Inferior | 100 degrees | Strong | High | The proposed turbines would dominate views from this location, approximately 2 miles away, as a large portion of the viewshed would include moving wind turbines. Views of the Project on the Horse Heaven Hills would be unobstructed, with views toward the southwest including residential and agricultural development, as well as the existing Nine Canyon Wind Project, which occupies a moderate portion of the landscape as viewed from this location. The series of proposed skylined wind turbines would be highly prominent in the view, resulting in high, long-term impacts on views, particularly where views of multiple wind turbines would overlap and appear larger in mass. |
| 12 | County Well Road | Residential, travel route | 2.5 miles | Level | 100 degrees | Moderate | Medium | The proposed turbines would be viewed in context with an existing transmission line. The existing transmission line has modified the existing setting, including the introduction of distinct, vertical lines. Due to the proximity of the proposed turbines (approximately 2.5 miles), the introduction of movement into the landscape, and the extent of view occupied by these structures, the Project would attract attention and begin to dominate views from this location. In consideration of the existing modifications in view, the Project would result in medium, long-term impacts on views from this location. These impacts would continue to increase as viewers would pass the existing transmission line into an area where views of the proposed wind turbines would be prominent. |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 13 | Travis Road South of Sellards Road | Residential, travel route | 1.1 miles | Level | 150 degrees | Strong | High | The proposed turbines would dominate views from this location, approximately 1 mile away, as a large portion of the viewshed would include moving wind turbines. Views of the Project in open, rolling hills would be unobstructed within a mostly intact existing landscape. The series of proposed skylined wind turbines would be highly prominent in the view, resulting in high, long-term impacts on views, particularly where views of multiple wind turbines would overlap and appear larger in mass. |
| N/A | Dispersed residences located 0.5 mile from proposed turbines (foreground views) | Residential | Less than 0.5 mile | Level | Up to 300 degrees | Strong | High | The proposed turbines would dominate views from dispersed residences located within the foreground distance zone (includes views from participating and non-participating properties). These views would be most impacted where views of the existing Nine Canyon Wind Project and existing transmission lines would be screened with the proposed turbines dominating a viewshed with limited existing modifications. The prominence of the proposed wind turbines rising above the landscape, including additional motion introduced by the turbine blades, would further attract attention from viewers and dominate the existing landscape character, resulting in high, long-term impacts on views from these locations. Viewers located on participating properties may have less visual sensitivity to modifications introduced by the Project, compared to viewers located on non-participating properties, but the level of visual contrast and Project dominance would remain the same. |
| N/A | Horse Heaven Hills Recreation Area | Recreation | 0.8 mile | Superior, level, and inferior | Up to 140 degrees | Strong | High | Views from the Horse Heaven Hills Recreation Area vary based on location, with elevated views represented by KOP 3, located on Chandler Butte, to inferior views occurring below the ridgeline and similar to KOPs 9 and 10. In general, views from this recreation area would be highly impacted where the Project would modify a large portion of the viewshed through the introduction of moving wind turbines. While hiking on trails below the ridge but within the recreation area, views may be partially screened by topography where visitors would only see the moving turbine blades repeatedly rising over the ridgeline as described for KOP 10. Viewers along the ridgeline trail would be located directly adjacent to the proposed turbines, where views would be strongly altered by the Project. The series of proposed wind turbines would be highly prominent in the view, resulting in high, long-term impacts on views from Chandler Butte, below the ridgeline trails, and from the ridgeline trail. |

**Table 5. Key Observation Point/Viewpoint Impact Table – Turbine Option 2**

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 1 | McNary NWR | Recreation | 5.8 miles | Inferior | 80 degrees | Moderate | Medium | Impacts would be similar to Option 1 except the taller turbines would be more prominent as viewed on the ridgeline. There would be fewer turbines in view, resulting in a less cluttered appearance, but since the proposed turbines would be larger in scale (and even larger as compared to the existing Nine Canyon Wind Project), the Project would result in medium, long-term impacts on views. |
| 2 | S Clodfelter Road – East, Central, and West | Residential | 3.5 miles | Inferior | 200 degrees | Strong | High | Impacts would be similar to Option 1 except the taller turbines would be more prominent as viewed on the ridgeline. There would be fewer turbines in view, resulting in a less cluttered appearance, particularly where views of multiple wind turbines would overlap and appear larger in mass. Since the proposed turbines would be larger in scale (and even larger as compared to the existing Nine Canyon Wind Project), the effects of a less cluttered view would be counterbalanced, resulting in high, long-term impacts on views. |
| 3 | Chandler Butte | Recreation | 2.8 miles | Superior | 50 degrees | Strong | High | Impacts would be similar to Option 1 except the taller turbines would be more prominent across the landscape. There would be fewer turbines in view, resulting in a less cluttered appearance, particularly where views of multiple wind turbines would overlap and appear larger in mass. Since the proposed turbines would be larger in scale (and even larger as compared to the existing Nine Canyon Wind Project), the effects of a less cluttered view would be counterbalanced, resulting in high, long-term impacts on views. |
| 4 | I-82 South | Travel route | 7.3 miles | Inferior | 100 degrees | Moderate | Medium | Impacts would be similar to Option 1 except the taller turbines would result in fewer turbines within view. The presence of fewer turbines would produce a less cluttered appearance, particularly where views of multiple wind turbines would overlap and appear larger in mass. Since the proposed turbines would be larger in scale (and even larger as compared to the existing Nine Canyon Wind Project), the effects of a less cluttered appearance would be counterbalanced, resulting in medium, long-term impacts on views |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 5 | Badger Mountain | Recreation | 4.7 miles | Level | 150 degrees | Strong | High | Impacts would be similar to Option 1 except the taller turbines would be more prominent as viewed on the ridgeline. There would be fewer turbines in view, resulting in a less cluttered appearance, particularly where views of multiple wind turbines would overlap and appear larger in mass. The relative scale of the turbines proposed for Option 2, compared to Option 1, would be apparent as views include residential and agricultural development, providing a source of scale comparison. |
| 6 | Bofer Canyon Road/I-82 | Travel route | 1.8 miles | Level | 120 degrees | Strong | High | Impacts would be similar to Option 1 but slightly increased in magnitude. The taller turbines proposed under this option would be apparent due to the existing transmission line providing a source of scale comparison, and most of the turbines proposed adjacent to this viewpoint would occur regardless of the option selected. |
| 7 | Highway 221 | Travel route, residential | 5.8 miles | Level | 70 degrees | Moderate | Medium | Impacts would be similar to Option 1 except the taller turbines would be more prominent as viewed from the highway. There would be fewer turbines in view, resulting in a less cluttered appearance, but since the proposed turbines would be larger in scale (and even larger as compared to the existing transmission line in view), the Project would result in medium, long-term impacts on views. |
| 8 | Kennewick (Canyon Lakes Area) – South and West | Residential | 5.4 miles | Inferior | 170 degrees | Moderate | Medium | Impacts on views would be reduced under Option 2, as the closest proposed wind turbine would be more than 1.5 miles further away compared to Option 1 (approximately 5.4 miles). There would also be fewer turbines in view, resulting in a less cluttered appearance. However, since the proposed turbines would be larger in scale, (and even larger as compared to the existing Nine Canyon Wind Project), the Project would result in medium, long-term impacts on views. |
| 9 | Benton City | Residential, travel route, commercial | 2.7 miles | Inferior | 10 to 80 degrees (based on level of screening) | Moderate | Medium | Impacts would be similar to Option 1 but slightly increased in magnitude. The taller turbines proposed under this option would be more prominent and most of the turbines proposed adjacent to this viewpoint would occur regardless of the option selected. |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Approx. Extent of Horizontal View Occupied by Project | Level of Visual Contrast | Magnitude of Impact | Impact Description |
|---|---|---|---|---|---|---|---|---|
| 10 | Badger Road | Residential, travel route | 1.5 miles | Inferior | 150 degrees | Strong | High | Impacts would be similar to Option 1 except the taller turbines would be more prominent as viewed from this area. There would be fewer turbines in view resulting in a less cluttered appearance, but since the proposed turbines would be larger in scale, (and even larger as compared to the existing modifications in view), the Project would result in high, long-term impacts on views. |
| 11 | Highland/ Finley Area | Residential | 2.5 miles | Inferior | 100 degrees | Strong | High | Impacts would be similar to Option 1, except the taller turbines would be more prominent as viewed on the ridgeline. There would be fewer turbines in view, resulting in a less cluttered appearance, particularly where views of multiple wind turbines would overlap and appear larger in mass. Since the proposed turbines would be larger in scale, (and even larger as compared to the existing Nine Canyon Wind Project), the effects of a less cluttered appearance would be counterbalanced, resulting in high, long-term impacts on views. |
| 12 | County Well Road | Residential, travel route | 2.5 miles | Level | 100 degrees | Moderate | Medium | Impacts would be similar to Option 1 but slightly increased in magnitude. The taller turbines proposed under this option would be apparent due to the existing transmission line that provides a source of scale comparison. |
| 13 | Travis Road South of Sellards Road | Residential, travel route | 1.1 miles | Level | 150 degrees | Strong | High | Impacts would be similar to Option 1 but slightly increased in magnitude. The taller turbines proposed under this option would be apparent due to the existing development in view, which provides a source of scale comparison. |
| N/A | Dispersed residences located 0.5 mile from proposed turbines (foreground views) | Residential | Less than 0.5 mile | Level | Up to 300 degrees | Strong | High | Impacts would be similar to Option 1 except the taller turbines would be more prominent as viewed from these residences. There would be fewer turbines in view, resulting in a less cluttered appearance. Since the proposed turbines would be larger in scale, the Project impacts would be most apparent where the existing Nine Canyon Wind Project or transmission lines are visible and provide a source of scale comparison. The Project would result in high, long-term impacts on views. |
| N/A | Horse Heaven Hills Recreation Area | Recreation | 0.8 mile | Inferior | Up to 140 degrees | Strong | High | Impacts would be similar to Option 1 except the taller turbines would be more prominent as viewed from this recreation area. There would be fewer turbines in view, resulting in a less cluttered appearance. However, since the proposed turbines would be larger in scale (and even larger as compared to the existing modifications in view), the Project would result in high, long-term impacts on views. |

#### 4.2.2.3 SOLAR ARRAYS

The Project would introduce forms, lines, colors, and textures associated with the photovoltaic arrays that are inconsistent with the existing landscape character. The conversion of existing agricultural lands to large expanses of photovoltaic panels would result in visual contrast through their flat, geometric forms and dark, slightly reflective surfaces, which are not common in the setting. The addition of the repetitive, vertical upright features associated with the solar trackers and additional fenced land would be noticeable in this rolling, panoramic landscape.

The Project would be visually prominent in the setting, resulting in medium to high impacts on landscape character. Based on the viewshed analysis from the *Aesthetics Technical Memorandum for the Horse Heaven Wind Farm Project* (Horse Heaven Wind Farm, LLC 2021b), the County Well Road (see Figure 5 in Attachment A) and Sellards Road (see Figure 6 in Attachment A) solar siting areas would be the most visible options, influencing a larger portion of the landscape, 45% and 51% respectively, within the 5-mile-wide area of analysis. These solar array siting areas would also occur in an area with a more intact existing landscape, as compared to the Bofer Canyon siting area, resulting in more intense impacts on landscape character. The Bofer Canyon option is located in proximity to the existing Nine Canyon Wind Project, which has introduced large-scale energy infrastructure into the landscape. The viewshed analysis identified that 31% of the area within the 5-mile-wide area of analysis would be influenced by the proposed solar arrays within the Bofer Canyon Siting Area (see Figure 7 in Attachment A).

Table 6 describes the impacts on views from the KOPs and other viewing locations associated with the three proposed solar array siting areas. In summary, activities during operation of any of the three solar array options would result in areas of (at minimum) medium, long-term, unavoidable, regional impacts on visual resources, with the County Well Road and Bofer Canyon siting areas resulting in areas of high, long-term, unavoidable, local impacts as viewed from identified KOP locations.

**Table 6. Key Observation Point/Viewpoint Impact Table – Solar Array**

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Level of Visual Contrast[a] | Magnitude of Impact | | | Impact Description |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | County Well Road Siting Area | Sellards Road Siting Area | Bofer Canyon Siting Area | |
| 1 | McNary NWR | Recreation | Not visible | Inferior | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |
| 2 | S Clodfelter Road – East, Central, and West | Residential | Not visible | Inferior | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |
| 3 | Chandler Butte | Recreation | 2.1 miles | Superior | Moderate | Medium | Negligible | Negligible | Views of the County Well Road option would be unobstructed with the Project being prominent and beginning to dominate views from this area. The contrast between the dark solar arrays and the tan grasses would be evident from this elevated viewing area, approximately 2 miles away, resulting in medium, long-term impacts on views. |
| 4 | I-82 South | Travel route | 6.0 miles | Level | Moderate | Negligible | Negligible | Medium | The Bofer Canyon option would be prominent in view and modify the existing landscape through the introduction of dark, geometric solar arrays in a rolling landscape comprised of golden, tan grasses. The impacts on these views would incrementally increase as motorists drive I-82 between this location and KOP 6 (approximately 10 miles), with some views of the solar arrays being intermittently screened by topography. From this location, the Project would result in medium, long-term impacts on views. |
| 5 | Badger Mountain | Recreation | Not visible | Level | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Level of Visual Contrast[(a)] | Magnitude of Impact | | | Impact Description |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | County Well Road Siting Area | Sellards Road Siting Area | Bofer Canyon Siting Area | |
| 6 | Bofer Canyon Road/I-82 | Travel route | 0.6 mile | Level | Strong | Negligible | Negligible | High | The Bofer Canyon option would be visually dominant and demand attention within the setting as solar arrays would be located on both sides of the interstate. An existing transmission line has modified the existing landscape, including the introduction of strong vertical lines. The contrast between the dark solar arrays and the tan grasses would be highly evident. In consideration of the existing modifications in view, the Project would result in medium, long-term impacts on views from this location. These impacts would continue to increase as viewers would pass the existing transmission line into an area where views of the proposed solar arrays would be highly prominent as viewed both to the east and west resulting in high, long-term local impacts. |
| 7 | Highway 221 | Travel route, residential | 3.1 miles | Level | Weak | Low | Low | Negligible | The County Well Road and Sellards Road options would begin to attract attention but would be visually subordinate in the setting. The low form of the solar arrays would blend with the existing landscape from this distance (approximately 3–4 miles) and would be partially screened by topography and existing structures. The Project would result in low, long-term impacts on views. |
| 8 | Kennewick (Canyon Lakes Area) – South and West | Residential | 5.9 miles | Inferior | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |
| 9 | Benton City | Residential, travel route, commercial | 3.9 miles | Inferior | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |
| 10 | Badger Road | Residential, travel route | 6.4 miles | Inferior | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |
| 11 | Highland/ Finley Area | Residential | 8.5 miles | Inferior | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |

| KOP # | Viewer Name | Viewer Type | Distance to Project | Viewer Position | Level of Visual Contrast[a] | Magnitude of Impact | | | Impact Description |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | County Well Road Siting Area | Sellards Road Siting Area | Bofer Canyon Siting Area | |
| 12 | County Well Road[b] | Residential, travel route | 0.2 mile | Level | Strong | High | Negligible | Negligible | The County Well Road Option would be prominent in view and modify the existing landscape through the introduction of dark, geometric solar arrays in a flat to rolling landscape comprised of tan-colored agricultural fields. An existing transmission line has already modified the landscape, including the introduction of strong vertical lines and geometric forms. In consideration of the existing modifications in view, the Project would result in medium, long-term impacts on views from this location. These impacts would continue to increase as viewers would pass the existing transmission line into an area where views of the proposed solar arrays would be highly prominent resulting in high, long-term local impacts. |
| 13 | Travis Road South of Sellards Road | Residential, travel route | 1.0 mile | Level | Moderate | Negligible | Medium | Negligible | The Sellards Road Option would be prominent in view and modify the existing landscape through the introduction of dark, geometric solar arrays in a rolling landscape comprised tan-colored agricultural fields (note: visual simulation in Attachment B does not include these views to the west). The views from this area are generally intact, with views of the Project occurring away from the direction of travel along the road. Views of the Project would therefore be short in duration. In consideration of view duration and partial screening by existing topography, the Project would result in medium, long-term impacts on views from this location. |
| N/A | Horse Heaven Hills Recreation Area | Recreation | Not visible | Inferior | Slight | Negligible | Negligible | Negligible | Project elements associated with the three solar siting areas would not be visually evident. |

[a] Level of visual contrast indicated here refers to the solar siting area(s) where a low, medium, or high magnitude of impact was identified in subsequent columns. For alternatives where a "negligible" magnitude of impacts was identified, the proposed solar arrays would not be readily seen from those KOP locations.

[b] Views from dispersed residences within the foreground distance zone (0–0.5 mile) were analyzed from KOP 12.

#### 4.2.2.4 SUBSTATIONS

The proposed substations would introduce a flat, rectangular, geometric form associated with the substation yard and tall, vertical, and geometrical substation equipment. These industrial features would contrast with the existing rolling agrarian landscape character. Where located adjacent to existing transmission lines or substations, the proposed elements would be in scale and consistent with the landscape setting, but in areas where there are limited existing utilities, the proposed substations would alter the landscape setting and would be visually prominent.

In general, the proposed substations would not attract attention from most locations within the area of analysis. The introduction of the proposed substations into views from KOPs 6 and 12, which have been modified by an existing transmission line, would result in long-term, medium impacts on views from 1.2 miles and 0.5 mile away respectively. The geometric form of the proposed substation yard and vertical structures would attract attention but would be co-dominant with the existing modifications in the landscape. Views from KOPs 3, 4, and 7 would be minimally modified by the proposed substations as views would occur from approximately 2.7 to 7.3 miles away, where the Project would mostly blend with the existing setting. The geometric form of the substation and vertical protrusions would appear in scale with the existing landscape from these more distant viewpoints.

The proposed substations would not be visible from KOPs 1, 2, 5, 8, 9, 10, 11, 13, and the Horse Heaven Hills Recreation Area, therefore no impacts from this Project component would occur on these views.

The proposed transmission lines would modify the existing landscape character through the introduction of repeating vertical transmission line structures, associated linear access roads, and associated vegetation clearing. These effects would be most apparent where there are no adjacent existing transmission lines or other vertical protrusions (e.g., communication towers, substations, etc.), and would result in long-term impacts on landscape character.

Impacts to viewers from proposed transmission lines would vary from high to low. The highest impacts would occur on the views from three KOP locations (KOPs 6, 12, and 13) located within 2 miles of the proposed transmissions lines. Views from KOP 6 have been modified by an existing transmission line, with the introduction of the proposed transmission line resulting in medium, long-term impacts from approximately 1.2 miles away. The form of the existing transmission line would be repeated by the Project (H-frame structures), reducing potential landscape clutter, and would be sited further away than the existing transmission line. Therefore, the Project would attract attention but would be co-dominant with the existing modifications.

The proposed transmission facilities would begin to dominate views from KOP 12, where an existing transmission line crosses the road, and the Project parallels the road with a series of transmission line structures stretching to the horizon. Due to the head-on view of the proposed transmission line and its difference in design compared to the existing line, the Project would result in medium, long-term impacts from this location. Views from KOP 13 would be highly impacted by the proposed transmission line. From this location, there are limited existing modifications in view, with the existing landscape setting appearing mostly intact. The Project would dominate these unobstructed views through the introduction of tall transmission line structures viewed as skylined above the low, rolling terrain.

The proposed transmission lines would not be visible from KOPs 1, 5, and the Horse Heaven Hills Recreation Area, therefore no impacts from this Project component would occur on these views. Impacts to views from all other KOPs would be low.

In summary, during operation the substations and transmission lines would result in areas of high, long-term, unavoidable, local impacts as well as areas of medium, long-term, unavoidable, regional impacts on visual resources.

#### 4.2.2.5 BATTERY ENERGY STORAGE SYSTEMS

Each proposed BESS would introduce a flat, rectangular, geometric form associated with its proposed yard, similar to the proposed substations, with equipment contained in geometric shipping containers (stacked up to 40 feet tall). These proposed features would contrast with the existing rolling agrarian landscape character.

In general, the proposed BESSs would not attract attention from most locations within the area of analysis. The introduction of the proposed BESSs into views from KOPs 6 and 12, which have already been modified by an existing transmission line, would result in long-term, medium impacts on views from 1.2 miles and 0.5 mile away respectively. The geometric form of the proposed BESSs, including the vertically stacked rectangular containers, would attract attention but would be co-dominant with the existing modifications. Views from KOPs 3, 4, and 7 would be minimally modified by the BESSs as views would occur from approximately 2.7 to 7.3 miles away, where the Project would mostly blend with the existing landscape setting. The geometric form of the BESSs from these three KOPs would appear in scale with the existing landscape from these more distant viewpoints.

The proposed BESSs would not be visible from KOPs 1, 2, 5, 8, 9, 10, 11, 13, and the Horse Heaven Hills Recreation Area, therefore no impacts from these Project components would occur on these views. Overall, activities during operation of the BESSs would result in medium, long-term, unavoidable, local impacts on visual resources.

#### 4.2.2.6 COMBINED IMPACTS OF COMPONENTS

The combined impacts of the different Project components would result in a landscape character dominated by large-scale energy infrastructure, including wind turbines, solar arrays, collector lines, access roads, multiple transmission lines and substations, the O&M facility, and the BESS. The existing setting does include a smaller wind farm and two existing transmission lines, but the scale of the Project and prominence of the proposed turbines would result in high, long-term impacts to the existing landscape.

Views from most residences and other KOP locations would primarily be impacted by the presence of the large, moving proposed wind turbines. The turbines would attract attention and depending on the extent of their viewshed modified by the turbines, could dominate views as described in Tables 4 and 5. In addition, some viewers, such as those associated with KOPs 3, 6, 12 and 13, would have views of multiple Project components, introducing additional variety and visual clutter into these views as shown in the visual simulations (see Attachment B). Views from these locations would be dominated by energy infrastructure as a result of the additive effects from each Project component, resulting in high, long-term impacts on these views. Since these impacts occur on viewpoints beyond the neighboring receptors, these effects would be regional in extent. In summary, activities during operation of all components of the Project would result in high, long-term, unavoidable, regional impacts on visual resources.

In consideration of the CESA methods and the EFSEC process, the Project was assessed as it relates to compliance with state and local visual management requirements. The Project analysis contained in this report would meet WAC 463-60-362(3), which establishes the requirements for a visual resource analysis to meet the EFSEC process. Specifically, the analysis describes the aesthetic impacts of the proposed Project, shows its location relative to physical features of the site, and outlines procedures to restore or enhance the landscape disturbed during construction (see Section 4.2.4 of this report for proposed mitigation measures, the Applicant's ASC including the Revegetation and Noxious Weed Management Plan and Initial Site Restoration Plan).

The 2020 Benton County Comprehensive Plan identified a planning goal to conserve the visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape, which are uniquely a product of ice age floods. The planning policy further states that the County should "consider the preservation of the ridges and hillside areas through various development regulations" (Benton County 2021). Since these lands have not been placed into Open Space Conservation, or other types of conservation, and there are no specific policies to protect the landscapes impacted by the Project, the Project would technically be in compliance with this aspect of the county plan. The Horse Heaven Hills and northern ridgeline would, however, become dominated by energy infrastructure, with potential long duration views from areas within the communities between Benton City and Kennewick. These impacts on views would be most intense where unobstructed views of a large number of turbines occur.

## *4.2.3 Impacts during Decommissioning*

The decommissioning and removal of the Project and its components would have similar impacts as the construction process. The option to repower the Project with new models of wind turbines and solar arrays would also have impacts similar to the construction process but would not result in long-term decommissioning and reclamation of the site. Repowering of the facility is not analyzed further in this report.

The decommissioning process would result in increased motion associated with construction equipment, short-term impacts from dust generation, and landform modification to more closely match preconstruction conditions. The removal of Project components would likely require additional ground disturbance and vegetation clearing, resulting in reclamation efforts similar to those conducted after the construction process was completed. The restoration of vegetation in these areas would take a number of years to fully establish, but over time the landscape impacted by the Project would begin to more closely resemble preconstruction conditions.

### 4.2.3.1 TURBINE OPTION 1

Impacts would be similar to the construction of the Project including the movement of vehicles attracting attention during decommissioning activities. Viewers located within the foreground distance zone (0–0.5 mile) or in locations where views would be occupied by large portions of the Project being decommissioned, would result in increased visual contrast on these views. These impacts would be short in duration and would cease after removal of the Project is complete and vegetation has been reestablished. Decommissioning activities for Turbine Option 1 would result in medium, short-term, probable, local impacts on visual resources.

### 4.2.3.2 TURBINE OPTION 2

Impacts would be similar to Turbine Option 1 except there are fewer proposed wind turbines, requiring fewer roads and other supporting facilities to be removed. This would result in slightly reduced visual contrast and modifications to the existing landscape introduced during Project decommissioning. Decommissioning activities for Turbine Option 2 would result in medium, short-term, probable, local impacts on visual resources.

### 4.2.3.3 SOLAR ARRAYS

Impacts would be similar to the construction of the Project, which would be focused within the selected solar siting areas. Within the fenced boundaries, all lands would be restored to more closely match preconstruction conditions, including revegetation of the site. Decommissioning activities for the solar arrays would result in low, short-term, probable, local impacts on visual resources.

#### 4.2.3.4 SUBSTATIONS

Impacts would be similar to the construction of the Project for both the proposed substations and transmission lines. The removal of the tall, vertical structures associated with both components would result in additional motion from construction equipment, structure deconstruction, and conductor removal. As described for other components, vegetation restoration would occur in these disturbed areas, and the landscape would begin to more closely resemble preconstruction conditions. Decommissioning activities for the substations and transmission lines would result in low, short-term, probable, local impacts on visual resources.

#### 4.2.3.5 BATTERY ENERGY STORAGE SYSTEMS

Impacts would be similar to the construction of the Project with the removal of the BESS containers and reclamation of those sites. This would include additional motion from construction equipment and associated dust during those activities. As described for other components, vegetation restoration would occur in these disturbed areas, and the landscape would begin to more closely resemble preconstruction conditions. Decommissioning activities for the BESSs would result in low, short-term, probable, local impacts on visual resources.

#### 4.2.3.6 COMBINED IMPACTS OF COMPONENTS

During Project decommissioning, there would be short-term impacts from these activities, which would occupy a large portion of the landscape and include removal of wind turbines, solar arrays, the O&M facility, transmission lines, BESSs, and substations, as well as the reclamation of access roads, turbine pads, and other areas disturbed during construction and operation of the Project. These activities would include views of additional vehicular traffic as well as areas of exposed soil after the removal of vegetation and during earthwork activities, prior to site reclamation efforts. The removal of vegetation would be noticeable in the setting and contrast with the existing character; however, over time, as vegetation is re-established in the area, it would begin to repeat vegetation patterns common in the area.

Viewpoints and KOPs located within the foreground distance zone (0–0.5 mile) would be most impacted by decommissioning, particularly where a large portion of their viewshed would be occupied by decommissioning multiple Project components simultaneously. Overall, activities during decommissioning of all components of the Project would result in medium, short-term, probable, regional impacts on visual resources.

### *4.2.4 Mitigation Measures*

#### 4.2.4.1 APPLICANT COMMITTED

To reduce impacts on landscape character and views and to strive to minimize any incompatibility with state and local visual management requirements, the Applicant has developed a series of BMPs and other mitigation measures as part of the Project ASC. Many of these BMPs, as well as the design of the Project, incorporated mitigation measures outlined in the BLM's *Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands* (BLM 2013) and CESA's visual impact assessment process (CESA 2011), including (but not limited to)

- Considering topography when siting wind turbines including less rigid turbine configurations in rolling terrain responding to local topography;
- Clustering or grouping turbines to break up long lines of turbines;

- Striving to create visual order and unity among turbine clusters;
- Maintaining operational turbines and other Project components;
- Preparing an effective decommissioning plan; and
- Selecting appropriate paint and finish selection to match the existing setting.

The Project also considered two different turbine options as part of the assessment of impacts to compare one design with more, smaller turbines (Option 1) to a design with fewer, taller turbines (Option 2). Due to the siting and operating requirements for wind turbines, there are limited mitigation measures that would considerably reduce impacts on visual resources, beyond downsizing the Project to reduce the number of turbines in view. The use of the following Applicant-committed mitigation in the Project design, construction, operation, and decommissioning stages would both directly and indirectly reduce impacts on visual resources:

- Active dust suppression will be implemented during construction.
- Following completion of construction, temporarily disturbed areas (e.g., laydown yards, crane paths not used as Project access roads) will be returned to their previous conditions once construction is complete.
- Restoration of the laydown yards will involve preconstruction stripping and storing topsoil (including weed avoidance), removing the gravel surface, regrading to preconstruction contours, restoring topsoil and de-compacting subsoils as needed, and reseeding with approved seed mixes.
- Following completion of construction, the temporary crane paths will be removed and the area restored in accordance with the Project's Revegetation and Noxious Weed Management Plan.
- The Applicant will provide a clean-looking facility free of debris and unused or broken-down equipment by storing equipment and supplies in designated areas within the O&M facilities and promptly removing damaged or unusable equipment from the site.
- The turbines and solar arrays will be uniform in design to present a trim, uncluttered, aesthetically attractive appearance.
- The Applicant will construct support facilities with non-reflective materials in muted tones and will use white or light gray, non-reflective paint to minimize the need for daytime aviation lighting and eliminate glare from the turbines.

#### 4.2.4.2 RECOMMENDED MITIGATION MEASURES

To further reduce impacts on visual resources, this report includes additional recommended mitigation measures adapted from the BLM (2013) and CESA (2011).

- **Wind turbines**
  - Relocate turbines located within the foreground distance zone (0–0.5 mile) of residences (BLM 2013; CESA 2011).
  - No piggyback advertising, cell antennas, commercial messages, or symbols placed on proposed wind turbines (BLM 2013).
  - Maintain clean nacelles and towers to avoid any spilled or leaking fluids accumulating dirt, contrasting with the clean, white/gray wind turbine (BLM 2013).
- **Solar arrays**
  - Use color-treated solar collectors and support structures to minimize color contrast with the existing landscape (BLM 2013).

  - Avoid complete removal of vegetation beneath solar arrays, where possible, to reduce contrast between the exposed soil and adjacent undisturbed areas (BLM 2013).

- **Substation and transmission lines**
  - Maximize the span length across highways, and other linear viewing locations, to reduce visual contrast at the highway crossings, moving the structures as far from the road as possible (BLM 2013).
  - Choose the type of proposed transmission structure (H-frame or monopole) to best match the adjacent transmission lines, minimizing clutter and visual contrast introduced into the landscape (BLM 2013).

Application of these mitigation measures would incrementally lessen visual contrast but based on the scale of the Project, including the height of the proposed wind turbines, these measured would not effectively reduce identified levels of contrast or degrees of impact magnitude.

## 4.3 Impacts of No Action Alternative

Under the No Action Alternative, impacts related to visual resources from the construction, operation, and decommissioning of the Proposed Action would not occur. Although the Proposed Action would not occur, other renewable energy projects may be constructed within the visual area of analysis. These projects could lead to development of a wind and/or solar facility within the Project's Lease Boundary, which could result in impacts similar to those described herein for construction, operation, and decommissioning of the Proposed Action. However, for the purpose of this analysis, it is assumed that no future development would occur within the Lease Boundary, and therefore, impacts on visual resources would not occur.

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# ATTACHMENT A

## Maps

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# Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

## Figure 1
## Turbine Layout Option 1

**BENTON COUNTY, WA**

HH-West Intermediate Substation (Alternate)

HH-West Step-up Substation 500-kV (Alternate)

HH-West Intermediate Substation (Primary)

BPA Webber Canyon Substation (Alternate)

BPA Webber Canyon Substation (Primary)

HH-West Step-up Substation 500-kV (Primary)

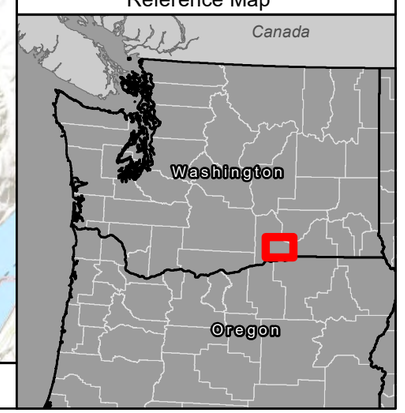
BPA Bofer Canyon Substation

HH-East Substation

- Project Lease Boundary
- Option 1 Turbine Layout
- Sellards Road 230-kV Transmission Line (Primary)
- Sellards Road 500-kV Transmission Line Step-up (Primary)
- Sellards Road 230-kV Transmission Line (Alternate)
- Solar Intertie 230-kV Transmission Line
- County Well Road 230-kV Transmission Line (Primary)
- County Well Road 500-kV Transmission Line Step-up (Primary)
- County Well Road 230-kV Transmission Line (Alternate)
- 230-kV Intertie Transmission Line (Primary)
- 230-kV Intertie Transmission Line (Alternate)
- 230-kV Alternate Intertie Transmission Line
- Project Substation (Primary)
- Project Substation (Alternate)
- Solar Siting Area
- Solar Array
- BPA Substation (Primary)
- BPA Substation (Alternate)

TETRA TECH

Reference Map




1:140,000 WGS 1984 UTM Zone 11N

0 0.5 1 2 3 4 Miles

NOT FOR CONSTRUCTION

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# Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

## Figure 2
## Turbine Layout Option 2

**BENTON COUNTY, WA**

HH-West Intermediate Substation (Alternate)

HH-West Step-up Substation 500-kV (Alternate)

HH-West Intermediate Substation (Primary)

BPA Webber Canyon Substation (Alternate)

BPA Webber Canyon Substation (Primary)

HH-West Step-up Substation 500-kV (Primary)

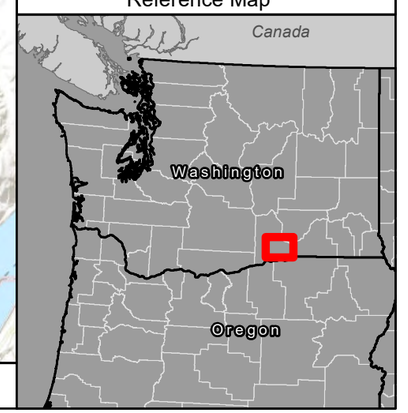
BPA Bofer Canyon Substation

HH-East Substation

- Project Lease Boundary
- Option 2 Turbine Layout
- Sellards Road 230-kV Transmission Line (Primary)
- Sellards Road 500-kV Transmission Line Step-up (Primary)
- Sellards Road 230-kV Transmission Line (Alternate)
- Solar Intertie 230-kV Transmission Line
- County Well Road 230-kV Transmission Line (Primary)
- County Well Road 500-kV Transmission Line Step-up (Primary)
- County Well Road 230-kV Transmission Line (Alternate)
- 230-kV Intertie Transmission Line (Primary)
- 230-kV Intertie Transmission Line (Alternate)
- 230-kV Alternate Intertie Transmission Line
- Project Substation (Primary)
- Project Substation (Alternate)
- Solar Siting Area
- Solar Array
- BPA Substation (Primary)
- BPA Substation (Alternate)

TETRA TECH

Reference Map




1:140,000 WGS 1984 UTM Zone 11N

0 0.5 1 2 3 4 Miles

NOT FOR CONSTRUCTION

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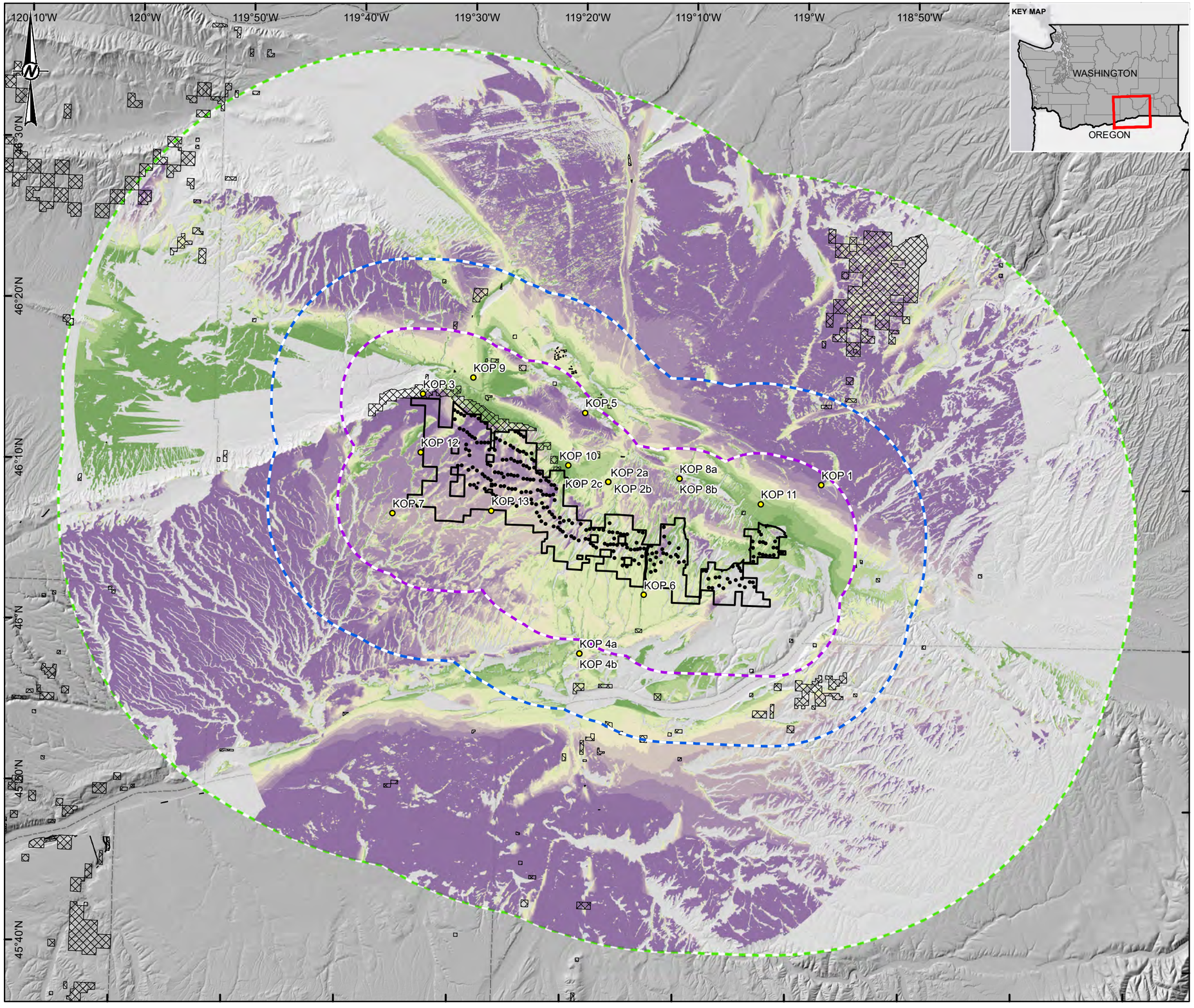


LEGEND

- Proposed Turbine Location (244 Turbines modeled at 499' blade-tip height)
- Viewpoint Location
- Project Lease Boundary
- 10 mile Buffer
- 5 mile Buffer
- 25 mile Buffer
- BLM Land

Number of Turbines Potentially Visible

- 0
- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 125
- 126 - 150
- 151 - 175
- 176 - 200
- > 200

0 5 10
MILES

**NOTE(S)**
1.

**REFERENCE(S)**
1. PROJECT FEATURES PROVIDED BY EFSEC, NOV 2021
2. SERVICE LAYER CREDITS:

CLIENT
State of Washington Energy Facility Site Evaluation Council

PROJECT
Horse Heaven Wind Farm

TITLE
**Viewshed Analysis Results: Turbine Layout Option 1**

CONSULTANT
GOLDER
MEMBER OF WSP

| | |
|---|---|
| YYYY-MM-DD | 2022-02-15 |
| DESIGNED | HJ |
| PREPARED | HJ |
| REVIEWED | KW |
| APPROVED | #### |

| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 20450841 | 2000 | A | 3 |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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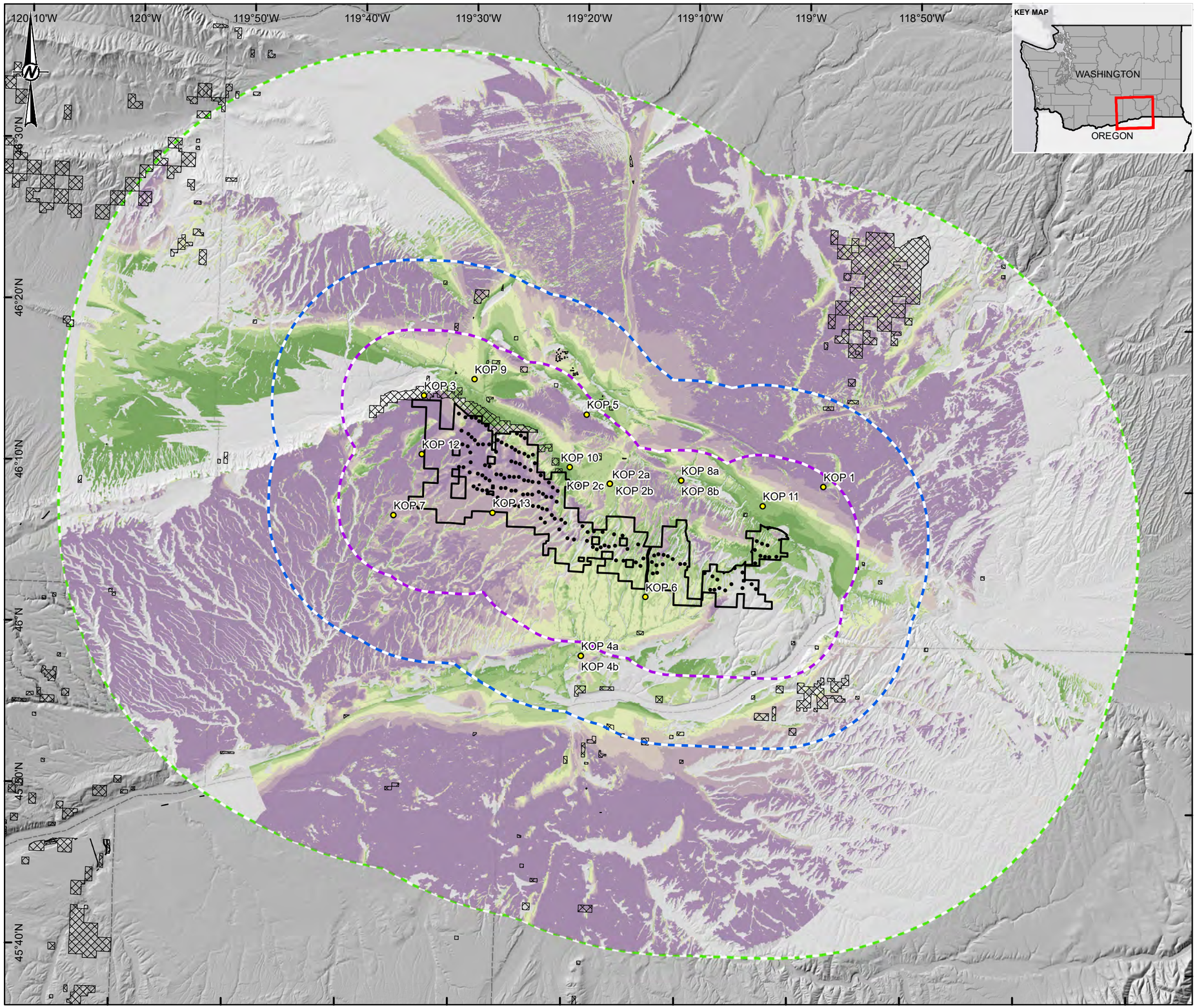


KEY MAP




**LEGEND**

- Proposed Turbine Location (150 Turbines modeled at 671' blade-tip height)
- Viewpoint Location
- Project Lease Boundary
- 10 mile Buffer
- 5 mile Buffer
- 25 mile Buffer
- BLM Land

**Number of Turbines Potentially Visible**

- 0
- 1 - 10
- 11 - 25
- 26 - 50
- 50 - 75
- 76 - 100
- 101 - 125
- 126 - 150

0 5 10

MILES

**NOTE(S)**

1.

**REFERENCE(S)**

1. PROJECT FEATURES PROVIDED BY EFSEC, NOV 2021
2. SERVICE LAYER CREDITS:

CLIENT

State of Washington Energy Facility Site Evaluation Council

PROJECT

Horse Heaven Wind Farm

TITLE

**Viewshed Analysis Results: Turbine Layout Option 2**

CONSULTANT

GOLDER
MEMBER OF WSP

| | |
|---|---|
| YYYY-MM-DD | 2022-02-15 |
| DESIGNED | HJ |
| PREPARED | HJ |
| REVIEWED | KW |
| APPROVED | #### |

| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 20450841 | 2000 | A | 4 |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

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# Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

## Figure 5
## Viewshed Analysis Results: Western Solar Array (County Well Road)

**BENTON COUNTY, WA**

- Visual Receptor
- Solar Array Fence Line
- Project Lease Boundary
- Solar Array 5-mile Buffer
- Potentially Visible
- Not Visible

TETRA TECH

Reference Map


1:90,000 WGS 1984 UTM Zone 11N

0 0.5 1 2 3 4 Miles

NOT FOR CONSTRUCTION

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# Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

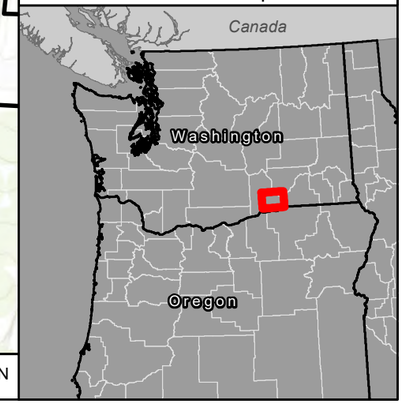
## Figure 6
## Viewshed Analysis Results: Western Solar Array (Sellards Road)

**BENTON COUNTY, WA**

- Visual Receptor
- Solar Array Fence Line
- Project Lease Boundary
- Solar Array 5-mile Buffer
- Potentially Visible
- Not Visible

TETRA TECH

Reference Map




1:80,000 WGS 1984 UTM Zone 11N

0 0.5 1 2 3 4 Miles

NOT FOR CONSTRUCTION

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# Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

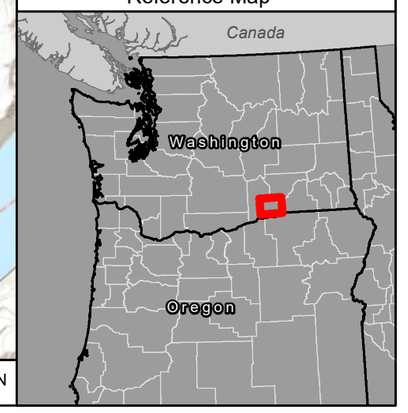
## Figure 7
## Viewshed Analysis Results: Eastern Solar Array (Bofer Canyon)

**BENTON COUNTY, WA**

- Visual Receptor
- Solar Array Fence Line
- Project Lease Boundary
- Solar Array 5-mile Buffer
- Potentially Visible
- Not Visible

TETRA TECH

Reference Map




1:90,000 WGS 1984 UTM Zone 11N

0 0.5 1 2 3 4 Miles

NOT FOR CONSTRUCTION

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# Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

## Figure 8
## Viewshed Analysis Results: Proposed Transmission Lines

**BENTON COUNTY, WA**

- Proposed Transmission Line
- Visual Receptor
- Project Lease Boundary
- 5-mile Buffer
- 10-mile Buffer
- Potentially Visible
- Not Visible

TETRA TECH

Reference Map


1:250,000 WGS 1984 UTM Zone 11N

0 2 4 8 12 16 Miles

NOT FOR CONSTRUCTION

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

## Figure 9
## Representative Viewpoint Locations

**BENTON COUNTY, WA**

- Existing Simulation with Direction
- Option 1 Turbine Location
- Proposed Substation
- Proposed Transmission Line
- Project Lease Boundary
- Solar Siting Area
- Existing Turbine
- Existing Substation
- Existing Transmission Line

TETRA TECH

Reference Map


1:150,000 WGS 1984 UTM Zone 11N

0 1 2 4 6 8 Miles

NOT FOR CONSTRUCTION

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# ATTACHMENT B

# Visual Simulations

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 1**
**Representative Viewpoint 1**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

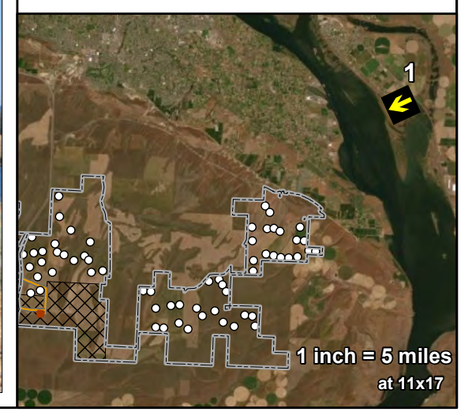
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 244 |
| Horizontal field of view (deg): | 75 |
| Vertical field of view (deg): | 20 |
| Max. WTGs within field of view: | 244 / 150 |
| Max. Visible WTGs at tip height: | 199 / 137 |
| Max. Visible WTGs at hub height: | 148 / 107 |
| Closest WTG (mi): | 5.2 / 5.8 |
| Furthest WTG (mi): | 26.8 / 26.5 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 6 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 6 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 2**
**Representative Viewpoint 2a**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

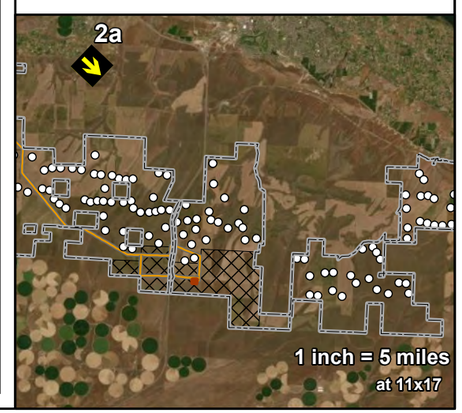
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 132 |
| Horizontal field of view (deg): | 57 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 75 / 38 |
| Max. Visible WTGs at tip height: | 56 / 29 |
| Max. Visible WTGs at hub height: | 50 / 24 |
| Closest WTG (mi): | 3.9 / 4.8 |
| Furthest WTG (mi): | 13.4 / 13 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 3**
**Representative Viewpoint 2b**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

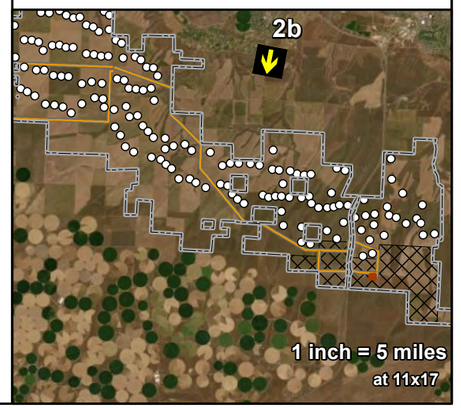
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 189 |
| Horizontal field of view (deg): | 57 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 37 / 19 |
| Max. Visible WTGs at tip height: | 36 / 19 |
| Max. Visible WTGs at hub height: | 30 / 17 |
| Closest WTG (mi): | 3 / 3.5 |
| Furthest WTG (mi): | 6.2 / 5.9 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 4**
**Representative Viewpoint 2c**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

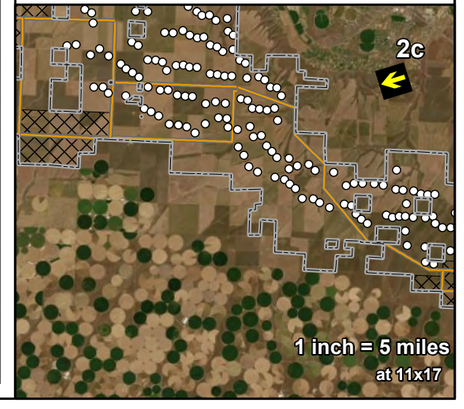
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 251 |
| Horizontal field of view (deg): | 56 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 85 / 60 |
| Max. Visible WTGs at tip height: | 46 / 39 |
| Max. Visible WTGs at hub height: | 24 / 21 |
| Closest WTG (mi): | 3.7 / 3.7 |
| Furthest WTG (mi): | 10.8 / 10.8 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | 3.4 |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 5**
**Representative Viewpoint 3**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

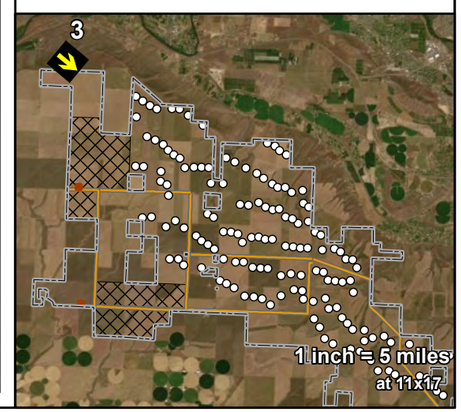
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 128 |
| Horizontal field of view (deg): | 56 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 244 / 150 |
| Max. Visible WTGs at tip height: | 239 / 150 |
| Max. Visible WTGs at hub height: | 219 / 139 |
| Closest WTG (mi): | 2.5 / 2.8 |
| Furthest WTG (mi): | 28.1 / 27.6 |
| Closest Solar Array (mi): | 2.1 |
| Closest Transmission Line (mi): | 4.2 |
| Closest Substation / BESS (mi): | Not in frame |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 6**
**Representative Viewpoint 4a**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

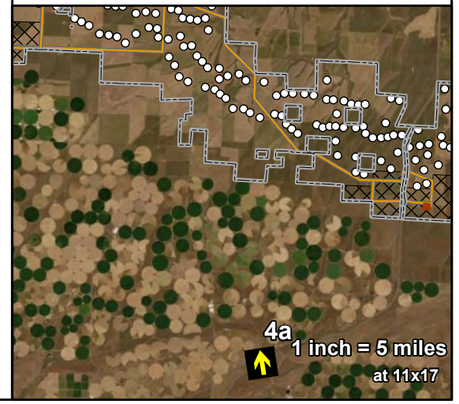
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 350 |
| Horizontal field of view (deg): | 57 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 163 / 110 |
| Max. Visible WTGs at tip height: | 51 / 40 |
| Max. Visible WTGs at hub height: | 34 / 26 |
| Closest WTG (mi): | 7.3 / 7.3 |
| Furthest WTG (mi): | 19.6 / 19.4 |
| Closest Solar Array (mi): | Not in frame |
| Closest Transmission Line (mi): | 6.5 |
| Closest Substation / BESS (mi): | Not in frame |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 7**
**Representative Viewpoint 4b**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

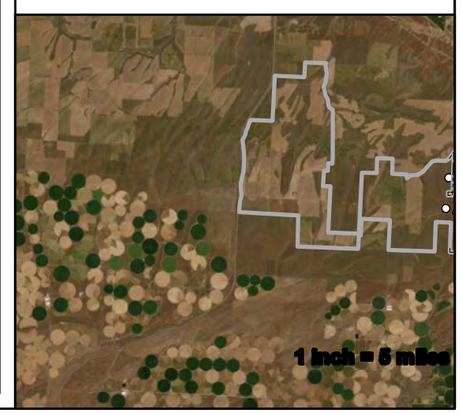
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 46 |
| Horizontal field of view (deg): | 57 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 85 / 42 |
| Max. Visible WTGs at tip height: | 66 / 37 |
| Max. Visible WTGs at hub height: | 58 / 33 |
| Closest WTG (mi): | 7 / 7.3 |
| Furthest WTG (mi): | 16.2 / 15.6 |
| Closest Solar Array (mi): | 6.0 |
| Closest Transmission Line (mi): | 6.5 |
| Closest Substation / BESS (mi): | 7.3 |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 8**
**Representative Viewpoint 5**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

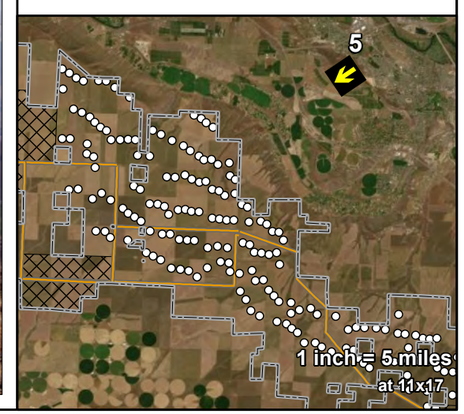
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 236 |
| Horizontal field of view (deg): | 58 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 101 / 76 |
| Max. Visible WTGs at tip height: | 101 / 76 |
| Max. Visible WTGs at hub height: | 101 / 76 |
| Closest WTG (mi): | 4.7 / 4.7 |
| Furthest WTG (mi): | 9.9 / 9.8 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 9**
**Representative Viewpoint 6**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

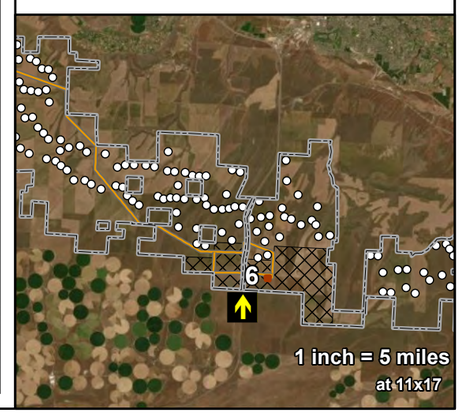
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 360 |
| Horizontal field of view (deg): | 60 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 41 / 17 |
| Max. Visible WTGs at tip height: | 37 / 17 |
| Max. Visible WTGs at hub height: | 29 / 17 |
| Closest WTG (mi): | 1.7 / 1.8 |
| Furthest WTG (mi): | 5.7 / 5 |
| Closest Solar Array (mi): | 0.6 |
| Closest Transmission Line (mi): | 1.2 |
| Closest Substation / BESS (mi): | Not in frame |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 10**
**Representative Viewpoint 7**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

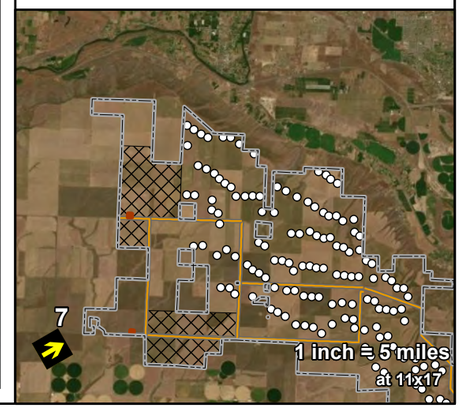
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 60 |
| Horizontal field of view (deg): | 58 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 122 / 90 |
| Max. Visible WTGs at tip height: | 118 / 87 |
| Max. Visible WTGs at hub height: | 110 / 85 |
| Closest WTG (mi): | 5.8 / 5.8 |
| Furthest WTG (mi): | 11.9 / 11.8 |
| Closest Solar Array (mi): | 3.1 |
| Closest Transmission Line (mi): | 2.2 |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 11**
**Representative Viewpoint 8a**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

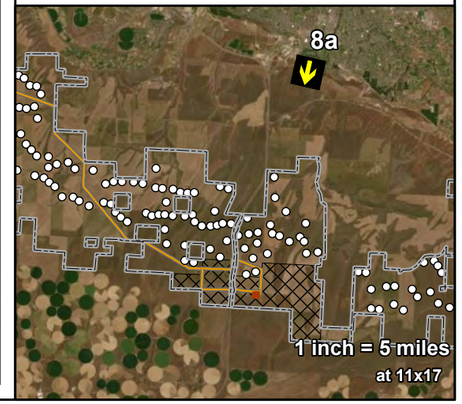
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 193 |
| Horizontal field of view (deg): | 57 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 43 / 20 |
| Max. Visible WTGs at tip height: | 40 / 19 |
| Max. Visible WTGs at hub height: | 37 / 15 |
| Closest WTG (mi): | 3.6 / 5.4 |
| Furthest WTG (mi): | 7.4 / 7.3 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

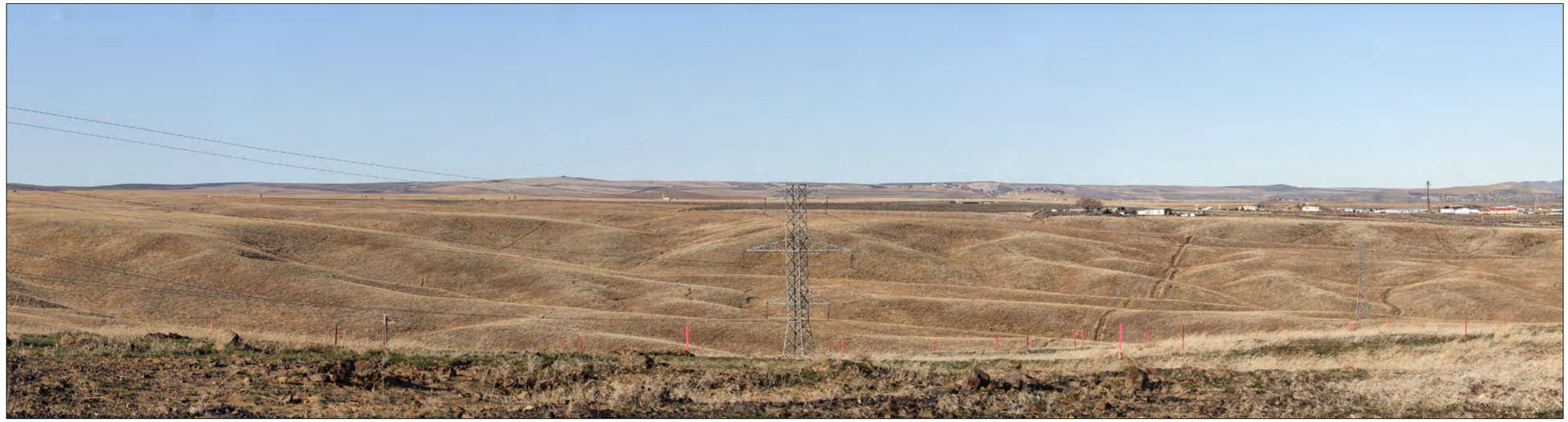
To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

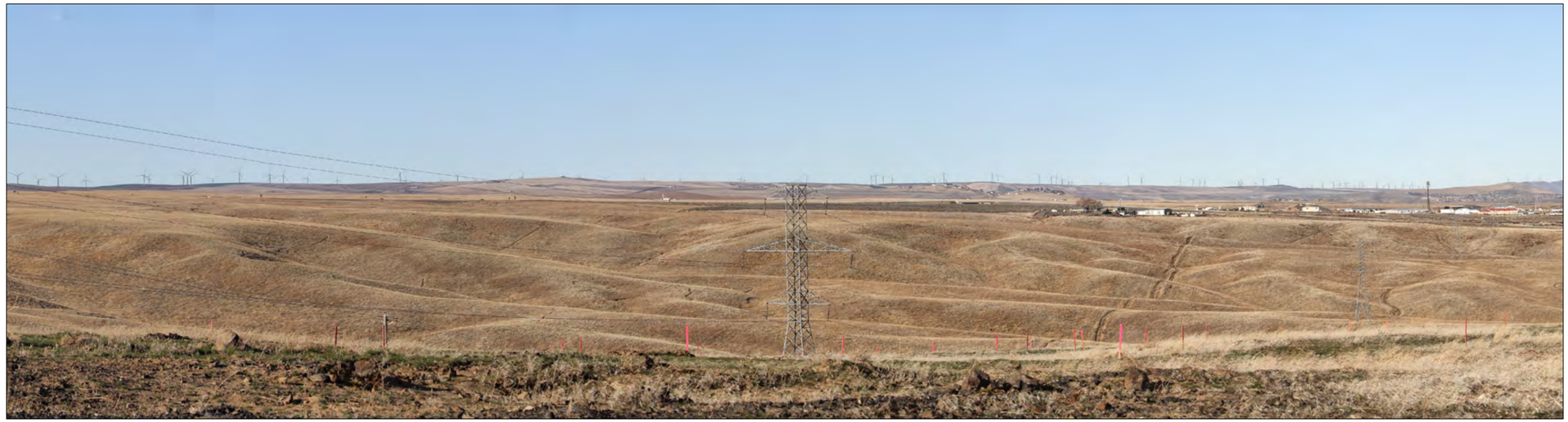
TETRA TECH



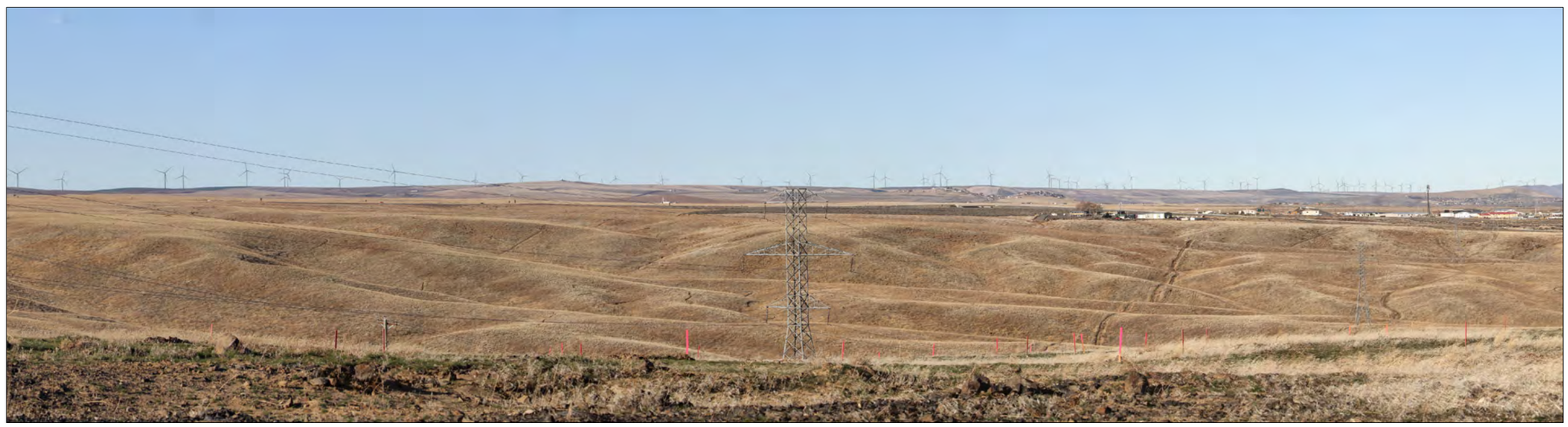
Existing Conditions



Project Simulation Option 1
244 WTG



Project Simulation Option 2
150 WTG



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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 12**
**Representative Viewpoint 8b**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

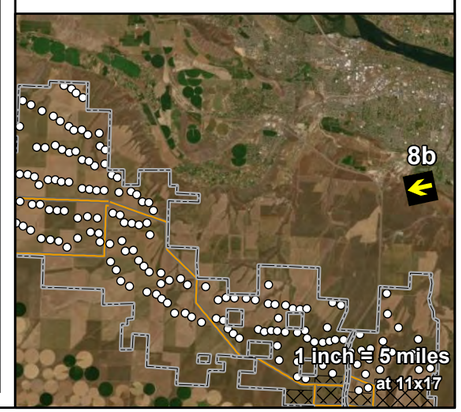
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 258 |
| Horizontal field of view (deg): | 57 |
| Vertical field of view (deg): | 15 |
| Max. WTGs within field of view: | 153 / 105 |
| Max. Visible WTGs at tip height: | 137 / 101 |
| Max. Visible WTGs at hub height: | 102 / 83 |
| Closest WTG (mi): | 5.9 / 6.1 |
| Furthest WTG (mi): | 16.8 / 16.6 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 8 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 8 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



Existing Conditions


Project Simulation Option 1
244 WTG


Project Simulation Option 2
150 WTG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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 13**
**Representative Viewpoint 9**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

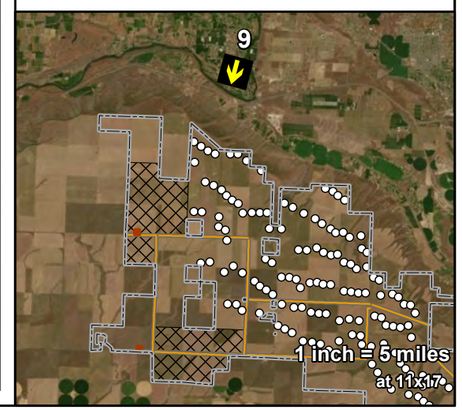
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 195 |
| Horizontal field of view (deg): | 73 |
| Vertical field of view (deg): | 19 |
| Max. WTGs within field of view: | 61 / 47 |
| Max. Visible WTGs at tip height: | 5 / 5 |
| Max. Visible WTGs at hub height: | 4 / 4 |
| Closest WTG (mi): | 2.7 / 2.7 |
| Furthest WTG (mi): | 9.7 / 9.6 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 6 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 6 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 14**
**Representative Viewpoint 10**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

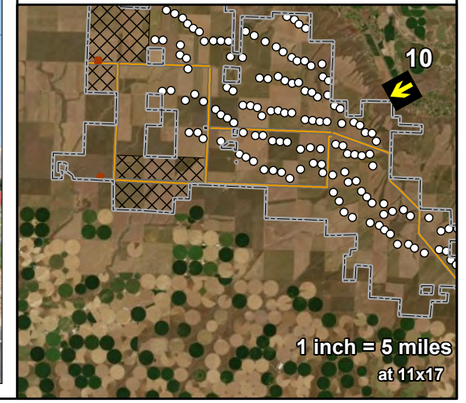
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 241 |
| Horizontal field of view (deg): | 76 |
| Vertical field of view (deg): | 20 |
| Max. WTGs within field of view: | 79 / 59 |
| Max. Visible WTGs at tip height: | 15 / 15 |
| Max. Visible WTGs at hub height: | 9 / 7 |
| Closest WTG (mi): | 1.5 / 1.5 |
| Furthest WTG (mi): | 6.6 / 6.6 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 6 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 6 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 15**
**Representative Viewpoint 11**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

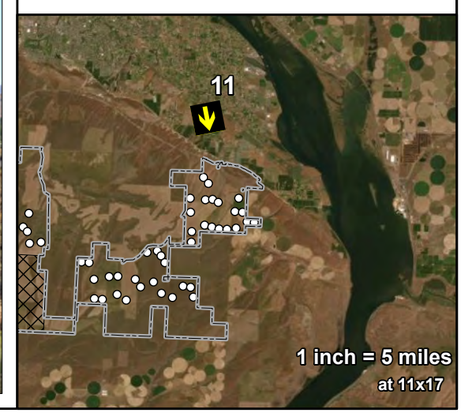
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 169 |
| Horizontal field of view (deg): | 73 |
| Vertical field of view (deg): | 19 |
| Max. WTGs within field of view: | 33 / 47 |
| Max. Visible WTGs at tip height: | 23 / 12 |
| Max. Visible WTGs at hub height: | 19 / 11 |
| Closest WTG (mi): | 2 / 2.5 |
| Furthest WTG (mi): | 6.6 / 6.6 |
| Closest Solar Array (mi): | No view |
| Closest Transmission Line (mi): | No view |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 6 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 6 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH

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Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 16**
**Representative Viewpoint 12**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

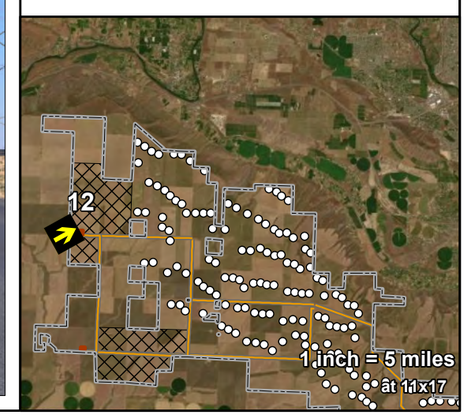
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 61 |
| Horizontal field of view (deg): | 73 |
| Vertical field of view (deg): | 19 |
| Max. WTGs within field of view: | 57 / 40 |
| Max. Visible WTGs at tip height: | 53 / 40 |
| Max. Visible WTGs at hub height: | 52 / 37 |
| Closest WTG (mi): | 2.5 / 2.5 |
| Furthest WTG (mi): | 8.7 / 8.6 |
| Closest Solar Array (mi): | 0.2 |
| Closest Transmission Line (mi): | 0.2 |
| Closest Substation / BESS (mi): | 0.5 |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 6 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 6 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



Existing Conditions

Project Simulation Option 1
244 WTG

Project Simulation Option 2
150 WTG

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# Horse Heaven Wind Project

SCOUT CLEAN ENERGY

**Figure 17**
**Representative Viewpoint 13**

**Existing Conditions and Project Simulations**

**BENTON COUNTY, WA**

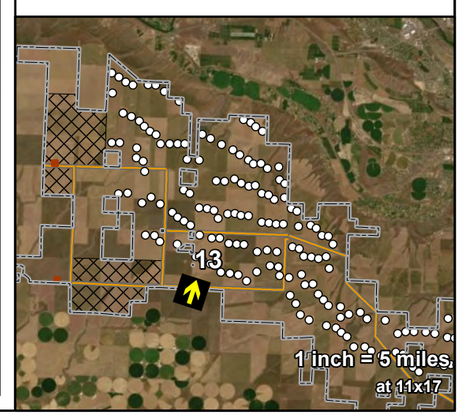
- Viewpoint Location and Photo Direction
- Project Lease Boundary
- Proposed Turbine Location
- Proposed Substation/BESS
- Proposed Transmission Line
- Solar Siting Area

| | |
|---|---|
| View direction (deg): | 18 |
| Horizontal field of view (deg): | 73 |
| Vertical field of view (deg): | 19 |
| Max. WTGs within field of view: | 73 / 54 |
| Max. Visible WTGs at tip height: | 69 / 52 |
| Max. Visible WTGs at hub height: | 65 / 51 |
| Closest WTG (mi): | 1.1 / 1.1 |
| Furthest WTG (mi): | 7.3 / 7.1 |
| Closest Solar Array (mi): | Not in frame |
| Closest Transmission Line (mi): | 0.2 |
| Closest Substation / BESS (mi): | No view |

To approximate how the project will appear to a viewer in the natural setting, this sheet should be printed at 11 x 17 inches, full size with no scaling, and viewed at 6 inches from the eye. If viewed on a computer monitor, the document should be scaled at 100% and viewed at 6 inches from the eye.

NOT FOR CONSTRUCTION

TETRA TECH



**APPENDIX 3.16-1**

# Horse Heaven Wind Farm's Proximity to other Environmental Stressors

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## Proximity to other Environmental Stressors

**Table 3.16-1A** provides additional information regarding additional environmental justice indexes, including traffic proximity, superfund proximity, hazardous waste proximity, underground storage tanks counts, and wastewater discharge toxicity, for the census block groups that intersect with or are adjacent to the Lease Area in the Horse Heaven Wind Farm study area.

According to the U.S. Environmental Protection Agency Environmental Justice Screening and Mapping Tool (EJ Screen) data, the "Value" and "State Average" columns in **Table 3.16-1A** for each of these environmental stressors are defined as follows:

- Traffic proximity - Count of vehicles (annual daily traffic) at major roads within 500 meters, divided by distance in meters (not km)
- Superfund proximity - Count of proposed superfund sites within 5 km (or nearest one beyond 5 km), each divided by distance in kilometers
- Hazardous waste proximity - Count of hazardous waste facilities within 5 km (or nearest beyond 5 km), each divided by distance in kilometers
- Underground storage tanks (USTs) - Count of leaking UST (LUSTs) (multiplied by a factor of 7.7) and the number of USTs within a 1,500-foot buffered block group
- Wastewater discharge – Risk Screening Environmental Indicators modeled toxic concentrations at stream segments within 500 meters, divided by distance in kilometers (km)

**Table 3.16-1A: Environmental Justice Indexes for the Census Block Groups that Intersect with or Located Adjacent to Project Lease Boundary**

| Environmental Stressors | Census Block Group | Value | State Average |
|---|---|---|---|
| Traffic Proximity (daily traffic count/distance to road) | Census Tract 108.07, Block Group 1 | 83 | 740 |
| | Census Tract 108.14, Block Group 1 | 57 | |
| | Census Tract 115.01, Block Group 1 | 2.3 | |
| | Census Tract 115.06, Block Group 1 | 8.9 | |
| | Census Tract 116, Block Group 1 | 3.4 | |
| | Census Tract 118.01, Block Group 3 | 89 | |
| Superfund Proximity (site count/km distance) | Census Tract 108.07, Block Group 1 | 0.061 | 0.18 |
| | Census Tract 108.14, Block Group 1 | 0.048 | |
| | Census Tract 115.01, Block Group 1 | 0.078 | |
| | Census Tract 115.06, Block Group | 0.077 | |
| | Census Tract 116, Block Group 1 | 0.055 | |
| | Census Tract 118.01, Block Group 3 | 0.035 | |

**Table 3.16-1A: Environmental Justice Indexes for the Census Block Groups that Intersect with or Located Adjacent to Project Lease Boundary**

| Environmental Stressors | Census Block Group | Value | State Average |
|---|---|---|---|
| Hazardous Waste Proximity (facility count/ km distance) | Census Tract 108.07, Block Group 1 | 0.26 | 2.2 |
| | Census Tract 108.14, Block Group 1 | 0.13 | |
| | Census Tract 115.01, Block Group 1 | 0.9 | |
| | Census Tract 115.06, Block Group 1 | 0.28 | |
| | Census Tract 116, Block Group 1 | 0.068 | |
| | Census Tract 118.01, Block Group 3 | 0.082 | |
| Underground Storage Tanks (USTs) (count/km$^2$) | Census Tract 108.07, Block Group 1 | 0.058 | 6.3 |
| | Census Tract 108.14, Block Group 1 | 0.086 | |
| | Census Tract 115.01, Block Group 1 | 0 | |
| | Census Tract 115.06, Block Group 1 | 0.03 | |
| | Census Tract 116, Block Group 1 | 0.0058 | |
| | Census Tract 118.01, Block Group 3 | 0.01 | |
| Wastewater Discharge (toxicity-weighted concentration/m distance) | Census Tract 108.07, Block Group 1 | 4.4E-06 | 0.021 |
| | Census Tract 108.14, Block Group 1 | N/A | |
| | Census Tract 115.01, Block Group 1 | 0.0012 | |
| | Census Tract 115.06, Block Group 1 | N/A | |
| | Census Tract 116, Block Group 1 | 0.00021 | |
| | Census Tract 118.01, Block Group 3 | 4.3E-08 | |

Source: EJ Screen (Environmental Justice Screening and Mapping Tool). 2022. Accessed September 20, 2022. https://www.epa.gov/ejscreen.
km = kilometers; km$^2$ = square kilometers; N/A = information not available