Exhibit U

Public Services

Sunstone Solar Project
May 2024

Prepared for

Sunstone Solar, LLC

Prepared by

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Acronyms and Abbreviations

ADT	average daily traffic
Applicant	Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC
BESS	battery energy storage system
BMP	best management practice
CFR	Code of Federal Regulations
ESCP	Erosion and Sediment Control Plan
FAA	Federal Aviation Administration
Facility	Sunstone Solar Project
I-84	Interstate Highway 84
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
OR	Oregon Route
OAR	Oregon Administrative Rule
ODA	Oregon Department of Aviation
ODOT	Oregon Department of Transportation
ORS	Oregon Revised Statutes
PILOT	Payment in Lieu of Taxes
RV	recreational vehicle
TIA	Traffic Impact Assessment

1.0 Introduction

Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC (Applicant), proposes to construct and operate the Sunstone Solar Project (Facility), a solar energy generation facility and related or supporting facilities in Morrow County, Oregon. This Exhibit U was prepared to meet the submittal requirements in Oregon Administrative Rule (OAR) 345-021-0010(1)(u).

2.0 Analysis

This exhibit describes how the Facility could affect local employment, population, housing, and transportation, and the ability of affected communities in the analysis area to provide public services resulting from construction and operation of the Facility. This exhibit presents an impact analysis for public services to demonstrate compliance with the Public Services standard, OAR 345-022-0110.

2.1 Analysis Area

In accordance with OAR 345-001-0010(35)(b) (and as defined in the Project Order), the analysis area for public services is the area within and extending 15-miles from the site boundary (Figure U-1; ODOE 2022). The site boundary is defined in detail in Exhibits B and C and is shown on Figure U-1. Where noted in the exhibit, communities outside of the analysis area are considered. Specifically, in order to encompass the relevant local labor market for Facility construction, a commute of up to 60 minutes is assumed for the housing and transportation analyses (see Section 2.3.2.5, 2.3.2.6, 2.4.6 and 2.4.7; Attachment U-1, Sunstone Solar Project Workforce and Housing Availability).

2.2 Assumptions Used to Evaluate Potential Impacts

OAR 345-021-0010(1)(u) Information about significant potential adverse impacts of construction and operation of the proposed facility on the ability of public and private providers in the analysis area to provide the services listed in OAR 345-022-0110, providing evidence to support a finding by the Council as required by 345-022-0110. The applicant must include:

(A) The important assumptions the applicant used to evaluate potential impacts.

Potential impacts were evaluated based on assumptions for the number of employees needed to construct and operate the Facility, population shifts, and use of transportation routes, as described in the following sections.

2.2.1 Employment

2.2.1.1 Construction

The Applicant anticipates that construction may begin as early as April 2026 and proposes to construct the Facility in phases. The size and construction schedule for each phase will depend on market demand. For the purposes of analysis, construction of each phase is assumed to consist of PV panels and associated infrastructure sufficient to generate 200 megawatts (MW) alternating current and will take approximately 47 months. See Exhibit B for details regarding the phased construction.

During construction, an estimated average workforce of 542 people will be employed for all phases of construction of the solar facility (including other related Facility infrastructure, not including the potential battery energy storage system [BESS]), with a maximum of 670 people during the peak months of construction, when multiple construction phases overlap. For the BESS, an average workforce of 140 and maximum of 280 people are estimated be employed throughout all phases of construction. For the combined solar facility and BESS, an average workforce of 682 people and maximum of 950 people will be employed during construction. Most construction workers will be employees of construction and equipment manufacturing companies under contract to the Applicant. Some specialty laborers will be required for installation of the solar components and BESS. See Attachment U-1 for the full analysis of Facility construction labor demand.

Construction workers would include a mix of general construction and specialized workers within a commutable duration of 60 minutes from the site boundary (e.g., from Morrow, Umatilla, and Gilliam counties in Oregon, and from Benton, Franklin, Klickitat, Walla Walla, and Yakima counties in Washington). While not all of these counties are located in their entirety within the analysis area or within 60 minutes of the Facility, housing data were reviewed for all of the counties because housing data are available at the countywide level. Additional communities were considered as appropriate if they were located just outside the 60-minute commute duration (see Attachment U-1).

For purposes of this analysis, consistent with the Project Order (ODOE 2022), the conservative assumption was made that no construction workers will be hired locally. Note that Attachment U-1, Section 2, Analysis of Workforce Availability provides a detailed analysis of potential availability of a local workforce and concludes that the regional labor market may support over half of the necessary workforce. Regardless of the assumptions used for this analysis, the Applicant's policy will be to hire locally to the extent practicable. Local hiring will depend on the availability of workers with the appropriate skill sets. As described in Attachment U-1, the phased nature of this project could create employment opportunities that span months and potentially years for some workers. However, for purposes of this analysis, the Applicant conservatively assumes that very few non-local construction workers will relocate their families or permanently relocate to the area. See Attachment U-1 for the full analysis of workforce and housing availability considering the Facility labor demand and local labor supply.

2.2.1.2 Operations

An estimated 10 permanent employees will be hired to operate and maintain the Facility, including seasonal vegetation maintenance personnel as required. The actual number of O&M staff will depend on the final size of the Facility. O&M staff will be hired locally, to the extent that skilled workers are available. Some outside contractors may be required from time to time for specialized maintenance tasks, such as solar panel inspections, or for positions that require previous experience at other solar generation facilities.

2.2.1.3 Decommissioning

When the Facility is decommissioned, operational jobs will be eliminated; however, there may be short-term contract jobs to monitor restored areas. Decommissioning of the Facility will require removal of most Facility components, including removal of solar arrays and other related or supporting facilities, and restoration of disturbed areas. These activities will result in temporary decommissioning employment similar to the construction of the Facility (average of about 542 people for construction of the solar facility, plus an additional 140 if the BESS is constructed, for a total of up approximately 682 on average for construction of both combined). Decommissioning is estimated to require a similar duration to construction, i.e., up to 47 months.

2.2.2 Population

2.2.2.1 Construction

Population in the analysis area will moderately but temporarily change as a result of Facility construction. For this analysis, it is assumed that none of the construction workers would be local residents, and an average of up to approximately 682 workers (for construction of the full project including BESS) and a maximum of about 950 workers will be temporary residents (i.e., in-migrants). If the BESS is not constructed, an average of approximately 542 workers and a maximum of about 670 workers would temporarily relocate to the area. The actual number of temporary residents may be as much as 50 percent lower if some workers can be hired locally as projected in the analysis provided in Attachment U-1. The in-migrants will likely settle in hotels, motels, recreational vehicle (RV) parks, houses, and other temporary housing located within a commutable duration from the Facility (60 minutes).

2.2.2.2 Operations

An estimated 10 permanent employees will be hired to operate and maintain the Facility, and some will already be local residents. Assuming conservatively that 50 percent (i.e., 5) of these employees are in-migrants with an average household size of three (higher than for temporary employees), up to approximately 20 new permanent residents could be added to the local population. It is assumed that these workers will live locally. It is also assumed that the seasonal/temporary employees will live locally.

2.2.3 Transportation

Various transportation routes will provide access to the Facility during construction and operations. These routes will be utilized for the transportation of solar components, other equipment and materials, water, and workers from outside of the analysis area to the Facility and will include state, county, and private roadways. Primary and alternate transportation routes are depicted on Figure U-2.

2.2.3.1 Primary and Alternate Transportation Routes

The primary transportation route is assumed to carry a majority of construction-related heavy-duty and light-duty delivery vehicles, as well as workforce traffic. The primary route will be via Interstate Highway 84 (I-84) to Bombing Range Road at the I-84/Irrigon Junction, continuing south to the site boundary (see Figure U-2). This route is assumed to constitute the primary transportation route because most of the construction-related traffic will be from workforce commute trips, and the communities that are most likely to provide temporary housing are located along or near this route. This route will also be the preferred route for limited oversize deliveries for Facility construction, such as support poles for the transmission line or the main power transformers.

The alternate transportation routes will be via I-84 to OR 207 south of Hermiston, continuing southwest on to OR-207 to exit onto Lower Sand Hollow Road, Melville Road, or Sand Hollow Road to access the portion of the site boundary south of OR-207; continuing southwest to exit onto Doherty Road or Grieb Lane to access the portion of the site boundary north of OR-207. Some workforce traffic may also come from south of the Facility (e.g., Heppner), taking OR-74 to OR-207 driving north on OR-207 until reaching the site location. For construction traffic analysis, an estimate of 10 percent of the workforce will be treated as using this route.

It is anticipated that O&M staff (both permanent and seasonal) will commute to the Facility site from nearby communities using similar routes as described above. Operational trips include employees traveling to work in their personal vehicles, as well as specialized personnel required for periodic inspections of Facility components who may travel in light-duty trucks. The occasional delivery truck may also access the site during operations.

2.2.3.2 Truck and Commuter Traffic

For the purposes of the traffic impact analysis, the Applicant assumes an average of 910 commuting trips (455 round trips) per day and 250 truck trips per day over approximately 1,224 construction work days (about 47 months). The first two and last two months of construction will have relatively small numbers of workers and deliveries and therefore were not included in calculating the average traffic; see Exhibit B for details of phasing and construction worker estimates. This is based on the estimated average and maximum materials and water deliveries and worker numbers. At the peak of construction, a maximum of approximately 1,266 commuting trips per day (633 round trips) may be expected, for a total maximum traffic volume including trucks of 1,516 trips per day. Anticipated transportation volumes are discussed further in Section 2.4.7 below.

A variety of truck types will be required for material and equipment deliveries. These include heavy-duty trucks, such as semi-trailer dump trucks and 40-foot container trucks, that will be carrying gravel and other materials required to improve or construct new access roadways. These heavy-duty trucks will also provide concrete for component foundations and materials for the module blocks themselves. In addition to concrete and gravel, lighter-duty, single-unit water tank trucks delivering water to the site will be required. Water will be needed for dust control during road construction (see Exhibit O).[1] Semi-trailer flat beds carrying electrical equipment and materials required for solar panel construction and power transmission also will be necessary. It is assumed construction crews will drive pick-up trucks to and from the Facility.

Typical operational traffic will be minimal, as the Facility will permanently employ only approximately 10 permanent on-site employees (including vegetation maintenance, panel and electrical maintenance, and all other related activities). Workers are assumed to reside in the Boardman, Hermiston/Stanfield, or Lexington/Ione areas, with approximately 3 workers coming from each of these areas. Occasional delivery trucks may also access the site to deliver routine office supplies to the Operations and Maintenance buildings. Therefore, during operations, an average of approximately 10 round-trip commuter trips per day will occur on weekdays (Monday-Friday). Larger amounts of traffic may be generated only if Facility components need significant repairs or replacement.

2.2.3.3 Points of Origin

During construction, an estimated average workforce of up to 682 people will be employed, with a potential maximum of up to 950 people on site at one time, when multiple disciplines of contractors complete their work simultaneously during the peak months of construction. As identified in Section 2.2.1.1, workers may find housing in several communities along the transportation routes and within a 60-minute commute duration of the site boundary (see Section 2.3.2.5, Housing).

An estimated 10 permanent personnel will be hired for operation and maintenance of solar panels; additional workers could be needed for battery storage as described in the economic impact analysis. Workers are assumed to reside in the Boardman, Hermiston/Stanfield, or Lexington/Ione areas, with approximately 3 workers coming from each of these areas.

[1] Note that other dust suppressants besides water may be utilized as necessary during extreme drought conditions (synthetic polymer emulsions, chemical suppressants, organic glues, and wood fiber materials) depending on the site and condition (to be applied by trained and certified vendors familiar with applicable environmental regulations including the federal Endangered Species Act, the Clean Water Act, the Salmon Recovery Act, and state and local regulations).

2.3 Affected Public and Private Service Providers

OAR 345-021-0010(1)(u)(B) Identification of the public and private providers in the analysis area that would likely be affected;

The following sections address the existing socioeconomic conditions and public and private service providers within the analysis area that could be affected by construction and operation of the Facility.

2.3.1 Counties, Cities, and Communities

While the Facility itself is entirely within Morrow County, the 15-mile analysis area includes the western portion of Umatilla County (Figure U-1). Table U-1 presents historical population estimates for communities in Morrow County within the analysis area. Although there are no incorporated communities in Umatilla County that are within 15 miles of the Facility, the county as a whole was included due its proximity to the Facility. Boardman, located north of the Facility in Morrow County, is the largest community in the analysis area. Boardman had a 2022 population of approximately 4,116 people, 33.4 percent of Morrow County's population total. See Attachment U-1 for a more detailed overview of the regional demographics surrounding the Facility.

Table U-1. Historical Population of Counties and Communities within the Analysis Area and Region

Location	Population		2010 -2022	
	Census 2010	Estimated 2022	Absolute Change	Percent Change
OREGON	3,831,074	4,281,851	990,777	12.0
Morrow County	**11,173**	**12,315**	**1,142**	**10.2**
Boardman	3,220	4,116	896	27.8
Heppner	1,291	1,182	-109	-8.4
Ione	329	343	14	4.3
Lexington	238	238	0	0
Umatilla County	**75,889**	**80,401**	**4,512**	**0.6**
Source: Attachment U-1; U.S. Census Bureau 2010, 2021				

All communities within a commutable duration (60 minutes) are considered in the housing analysis (see Sections 2.3.2.5 and 2.4.6). According to the most recent available U.S. Census Bureau (2015) residence to workplace data for 2011 to 2015, nearly 65 percent of Morrow County residents work within Morrow County (3,427 commuters per day). Morrow County receives 1,451 commuters per day from Umatilla County; 134 commuters per day from Benton County, Washington; 61 commuters per day from Multnomah County, Oregon; and 53 commuters per day from Lane County, Oregon. The remaining 155 Morrow County commuters travel from multiple other, more distant counties.

2.3.2 Service Providers

2.3.2.1 Sewers and Sewage Treatment

No community in the analysis area currently provides sewers or sewage treatment to the Facility site. The nearest developed sewer system is located in the community of Heppner, approximately 14 miles from the site boundary. Sewage treatment in this rural area is limited to on-site private septic systems. During construction, sanitary waste will be collected on-site in portable toilets that will be provided and maintained by a licensed subcontractor. During operation, sanitary waste will be limited to domestic wastewater from the O&M buildings, which will be discharged to licensed on-site septic systems located within the site boundary.

2.3.2.2 Water

Water sources in the site boundary are limited to private landowners' wells. Most communities within the analysis area have public water systems that serve their respective areas, but those systems will not be used or affected by the Facility. The nearest developed water systems are located in the communities of Lexington or Heppner, approximately 10 and 14 miles from the site boundary, respectively. During construction, water will be trucked to the site from Stanfield Public Works, Boardman Public Works, and/or the Port of Morrow, or local other licensed providers. These utility providers can provide sufficient water to meet the Facility requirements (see Exhibit O). Alternatively, water may be obtained from a municipality-approved source or other source that has regulatory approval for construction use. During operations, water will be provided by newly constructed wells near each of the O&M buildings that will cumulatively provide no more than a total of 5,000 gallons per day. See Exhibit O for a more detailed discussion.

2.3.2.3 Stormwater Drainage

No community in the analysis area currently provides stormwater drainage service to the Facility site, with the exception of minimal stormwater drainage facilities associated with public roads maintained by Morrow or Umatilla counties. The nearest developed stormwater drainage facilities in the vicinity of the Facility are located within the limits of the communities of Lexington and Heppner (10 and 14 miles from site boundary, respectively). The Facility will not connect to or otherwise impact either communities' stormwater systems. During construction, numerous best management practices (BMPs), outlined in the Facility's National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Discharge General Permit 1200-C and accompanying Erosion and Sediment Control Plan (ESCP), will be implemented to minimize erosion and sedimentation that could alter the surrounding stormwater drainages. See Exhibit I for more details.

2.3.2.4 Solid Waste Management

The incorporated communities near the Facility will provide solid waste management services to their respective incorporated areas. Morrow and Umatilla counties provide solid waste disposal

and recycling services through franchise agreements with various private providers. Solid waste disposal for the Facility during construction and operations will be provided by private contract with a local commercial hauler or haulers. The public landfill closest to the Facility is the Finley Buttes Regional Landfill, located approximately 11 miles south of Boardman, Oregon and 3.2 miles north of the site boundary. The Finley Buttes Regional Landfill has confirmed that it has sufficient capacity to accommodate the Facility's solid waste needs and has projected that 180 years are left in landfill's current footprint (see Attachment U-2).

Morrow County has adopted a Solid Waste Management Ordinance that addresses solid waste disposal and recycling in the county. The Applicant will coordinate with waste and recycling franchisees servicing the Facility to maintain required records as needed for compliance with the ordinance.

2.3.2.5 Housing

Varying degrees of housing options are provided in incorporated and unincorporated communities within the analysis area, and within a commutable duration from the Facility (60 minutes) outside of the analysis area. Typically, construction employment on a project like this is relatively short-term, and workers drawn to the region for this opportunity are unlikely to relocate permanently to the region or relocate with their families. Thus, few construction workers are likely to purchase housing in the region. The phased nature of this project, however, could create employment opportunities that span months and potentially years for some workers, who would likely demand rental housing over temporary hotel/motels and RV parks. Thus, the analysis focuses on these three housing types: rental housing, hotel/motel lodging, and RV parks (see Attachment U-1 for the full analysis details). The housing availability analysis provided in Attachment U-1 examined all available data online, but the Applicant believes it is likely that additional housing is available within 60 minutes of the Project area in RV campgrounds or private, long-term rentals offered through companies like Airbnb. Additionally, the Applicant is working with Morrow County to assess other housing options.

Rental Housing

Table U-2 summarizes the rental housing stock for the reasonable commuting area for the Facility. The final column shows the estimated number of vacant rental units as of 2021. The data in this table are drawn from the U.S. Census Bureau survey data but, particularly in small communities, have high margins of error and may not accurately reflect actual availability at the time of the survey, and don't precisely reflect current availability. Communities where this is of issue are indicated with asterisks. Rental housing in Morrow and Gilliam Counties is particularly scarce, though rental housing units make up almost half the housing stock in Boardman and Heppner, for example.

Table U-2. Housing Supply in Counties and Communities within Commutable Duration

Location	Total Housing Units (Occupied or Vacant)	Percent of Housing Units that are Rentals	Percent of Rental Units that are Vacant	Estimated Number of Vacant Rental Units
Morrow County, OR	**4,671**	**30**	**6**	**77**
Boardman	1,180	49	5*	28*
Heppner	634	48	9*	28*
Ione	192	26	0*	0*
Irrigon	765	20	1*	2*
Lexington	68	6*	0*	0*
Umatilla County, OR	**30,930**	**35**	**6**	**638**
Echo	239	50	0*	0*
Hermiston	6,796	39	2	46
Stanfield	937	25	3*	6*
Umatilla	2,044	31	1*	9*
Pendleton	6,843	42	4	127
Pilot Rock	562	16	2*	1*
Gilliam County, OR	**1,120**	**28**	**8**	**24**
Arlington	246	29	2*	1*
Condon	499	22	4	5
Benton County, WA	**79,020**	**33**	**2**	**631**
Franklin County, WA	**24,194**	**30**	**1**	**88**
Total	**160,940**	**-**	**-**	**1,711**

Source: U.S. Census Bureau 2021; Attachment U-1

Note: * indicates estimate has a large margin of error (using a 90% confidence level) and there is uncertainty in this result. See Attachment U-1 for further detail.

Hotels/Motels

Hotel/motel accommodations are plentiful within a commutable duration (Table U-3 and U-4). Establishments are concentrated in Hermiston, Pendleton, and Tri-Cities (i.e., Kennewick, Pasco, and Richland in Benton County, Washington), between 30 and 60 miles away from the Facility. There are almost 6,000 rooms in this area. Just 4 percent are in Morrow County, while half of the rooms are in Benton County (Tri-Cities) and almost 30 percent are in Umatilla County.

Table U-3. Regional Hotel/Motels by City and County within Commutable Duration

Location	Total Hotel/Motels	Total Hotel Rooms	Percent of Total	Vacant Rooms at Peak Occupancy
Morrow County, OR	**6**	**249**	**4%**	**57**
Boardman	5	234	-	-
Heppner	1	15	-	-
Ione	0	0	-	-
Irrigon	0	0	-	-
Lexington	0	0	-	-
Umatilla County, OR	**28**	**1,725**	**29%**	**397**
Echo	0	0	-	-
Hermiston	9	656	-	-
Stanfield	0	0	-	-
Umatilla	3	142	-	-
Pendleton	16	927	-	-
Pilot Rock	0	0	-	-
Gilliam County, OR	**3**	**69**	**1%**	**16**
Arlington	1	33	-	-
Condon	2	36	-	-
Benton County, WA	**42**	**2,928**	**50%**	**673**
Franklin County, WA	**16**	**917**	**16%**	**211**
Total	**95**	**5,888**	**100%**	**1,354**

Source: STR 2023; ECONorthwest 2023 (Attachment U-1)

Note: Numbers may not sum due to rounding.

Table U-4. Regional Hotel/Motels by City and County within Commutable Duration

Drive Time to Facility	Number of Establishments	Number of Rooms
0 to 30 minutes	10	501
30 to 60 minutes	40	1,470
Total	**50**	**1,971**

Source: STR 2023; ECONorthwest 2023 (Attachment U-1)

As demonstrated in Attachment U-1, seasonal occupancy patterns are predicted, with lower demand in the winter months and higher demand in the summer months. In the year April 2022 to April 2023, the lowest occupancy was 45 percent in December and the high was 77 percent in June, with an average annual vacancy rate of 37 percent (STR 2023). At the recent peak occupancy of 77 percent in June 2022, there were approximately 1,350 rooms available in the region (STR 2023; see Attachment U-1).

RV Parks

There are almost 3,000 RV sites in the Facility region. Like hotels and motels, they are concentrated along major highways in Oregon and Washington and are generally outside of the 30-minute drive time to the Facility, with the majority between 30 and 60 miles away (Tables U-5 and U-6).

Based on a review of online sources, seven RV parks are within Morrow County with 260 sites: one in Boardman, four in Heppner, and two in Irrigon. Those RV parks closest to the Facility have a higher percent of hookups than those farther away, though around two-thirds of all RV sites in the region offer a full hookup (Table U-5).

The two largest RV parks in the region (both located in Hermiston, Oregon) identified construction workers as their most common long-term customers; They have annual occupancy rates ranging from 95 to 99 percent. Occupancy remains high throughout the year, and they are nearly always at capacity in the fall, spring, and summer (personal communication; see Attachment U-1 for full discussion).

Table U-5. Regional RV Park and RV Sites within Commutable Duration

Location	Total RV Parks	Total RV Sites
Morrow County, OR	**7**	**260**
Boardman	1	63
Heppner	4	74
Ione	0	0
Irrigon	2	123
Lexington	0	0
Umatilla County, OR	**15**	**571**
Echo	1	9
Hermiston	3	209
Stanfield	2	90
Umatilla	5	26
Pendleton	4	237
Pilot Rock	0	0
Gilliam County, OR	**5**	**80**
Arlington	3	54
Condon	2	26
Benton County, WA	**11**	**1,395**
Franklin County, WA	**4**	**364**
Total	**42**	**2,670**

Source: Campendium 2023, Good Sam 2023, Travel Oregon 2023; see ECONorthwest, Attachment U-1

Table U-6. Regional RV Park Capacity and Amenities

Drive Time to Facility	Number of Sites	Percent of Sites with Full Hookups	Percent of Sites with Dump Stations
0 to 30 minutes	274	76	86
30 to 60 minutes	1,105	76	48
Total	**1,379**	**76**	**69**
Source: Campendium 2023, Good Sam 2023, Travel Oregon 2023; ECONorthwest (Attachment U-1)			

2.3.2.6 Traffic Safety and Transportation

The provider of transportation services in Morrow County is the Morrow County Road Department within the Public Works Department. The state transportation system in the Facility vicinity is provided and maintained by the Oregon Department of Transportation (ODOT).

Primary Transportation Routes

The primary transportation route for construction vehicles and some workforce traffic will be via I-84 to Bombing Range Road at the I-84/Irrigon junction, continuing south to the site boundary. The roads in the primary transportation route include interstate, state, and county roadways. I-84 serves as the primary east-west route through Morrow County. I-84 is a four-lane divided highway, with two lanes traveling in each direction and 6-foot paved shoulders. Bombing Range Road is considered a major collector road by Morrow County (Morrow County 2012).

Alternate Transportation Route

An alternate transportation route will be via I-84 to OR-207 south of Hermiston, continuing southwest on to OR-207 to exit onto Lower Sand Hollow Road, Melville Road, or Sand Hollow Road to access the portion of the site boundary south of OR-207; continuing southwest to exit onto Doherty Road, or Grieb Lane to access the portion of the site boundary north of OR-207. OR-207 is a two-lane highway, undivided, and is classified as a regional highway and minor arterial road. The county roadways listed in the alternate transportation route are not given a classification by Morrow County (Morrow County 2012). Some workforce traffic may also come from south of the Facility (e.g., Heppner), taking OR-74 to OR-207 driving north on OR-207 until reaching the site location.

Traffic Volumes

Table U-7 provides updated traffic volumes for the expected transportation routes. State highway volumes were published in the 2017 through 2021 Traffic Volume Tables (ODOT 2017, ODOT 2018, ODOT 2019, ODOT 2020, ODOT 2021). At the time of this assessment the 2022 data have not been published. Table U-7 shows the average daily traffic (ADT) volumes for the most recent 5 years of data available at various milepost locations along the transportation routes.

Table U-7. Transportation Route Average Daily Traffic Volumes

Highway[1]	Location	Milepost	2017	2018	2019	2020	2021	Average Percent Change 2017-2021
I-84								**+11**
I-84 (No. 6)	Boardman Jct. Automatic Traffic Recorder, Sta. 25-008, 0.60 mile southeast of Columbia River	168.55	17,000	17,700	17,900	16,781	19,389	+14
I-84 (No. 6)	0.40 mile east of Paterson Ferry Interchange	171.53	17,400	18,200	18,400	17,237	19,796	+14
I-84 (No. 6)	0.30 mile east of Ordnance Interchange	178.28	18,100	19,000	19,100	17,982	20,451	+13
I-84 (No. 6)	0.60 mile east of McNary Interchange (I-82)	180.05	15,400	16,100	16,200	15,168	16,459	+7
I-84 (No. 6)	0.30 mile east of Westland Interchange	180.71	15,400	16,100	16,100	15,143	16,432	+7
I-84 (No. 6)	0.30 mile east of Hermiston Highway Interchange (OR207)	183.16	13,400	14,000	14,000	13,117	14,529	+8
OR-207								**+25**
OR-207 (No. 333)	0.08 mile north of Old Oregon Trail (I-84)	12.42	7,300	7,000	7,000	None	7,729	+6
OR-207 (No. 333)	0.10 mile south of Old Oregon Trail (I-84)	12.60	1,500	1,700	1,700	None	2,101	+40
OR-207 (No. 333)	0.10 mile north of Lexington-Echo Highway	17.71	1,400	1,500	1,500	1,429	1,531	+9
OR-207 (No. 320)	0.05 mile east of Hermiston Highway (OR207)	27.29	380	320	320	310	365	+4
OR-207 (No. 320)	0.05 mile south of Hermiston Highway (OR207)	27.19	1,000	1,100	1,100	1,059	1,464	+46

Highway[1]	Location	Milepost	2017	2018	2019	2020	2021	Average Percent Change 2017-2021
OR-207 (No. 320)	0.13 mile west of Gordon Creek Road	19.89	910	1,000	1,000	972	1,346	+48
OR-207 (No. 320)	On Butter Creek Bridge	19.48	850	860	850	830	1,113	+31
OR-207 (No. 320)	0.10 mile southwest of Grieb Lane	13.62	790	850	850	822	995	+21
OR-207 (No. 320)	0.02 mile northeast of Kilkenney Road	10.15	730	790	780	762	935	+28
OR-207 (No. 320)	0.02 mile north of Turner Lane	3.89	780	870	870	842	986	+26
OR-207 (No. 320)	0.11 mile east of Lexington Grange Road	2.48	790	880	870	850	1,005	+27
OR-207 (No. 320)	0.02 mile south of Lexington Grange Road	2.35	840	940	940	909	1,058	+26
OR-207 (No. 320)	North city limits of Lexington	0.25	910	1,000	1,000	991	1,072	+18
OR-207 (No. 320)	0.02 mile northeast of East Street	0.08	870	1,000	990	959	1,122	+29
OR-207 (No. 320)	0.02 mile northeast of Heppner Highway (OR74)	0.02	990	1,100	1,000	1,019	1,206	+22
OR-74								**+27**
OR-74 (No. 52)	0.02 mile northwest of Lexington-Echo Highway (OR207)	36.40	840	920	910	884	1,024	+22
OR-74 (No. 52)	0.02 mile southeast of Lexington-Echo Highway (OR207)	36.47	1,300	1,500	1,500	1,482	1,680	+29
OR-74 (No. 52)	0.02 mile southeast of "C" Street	36.62	1,300	1,400	1,400	1,317	1,614	+24

Highway[1]	Location	Milepost	2017	2018	2019	2020	2021	Average Percent Change 2017-2021
OR-74 (No. 52)	Lexington Automatic Traffic Recorder, Sta. 25-007, 1.38 miles southeast of Lexington-Echo Highway No. 320 (OR207)	37.83	1,400	1,400	1,400	1,444	1,450	+4
OR-74 (No. 52)	0.02 mile southeast of Bunker Hill Lane	41.58	1,300	1,400	1,400	1,318	1,622	+25
OR-74 (No. 52)	0.02 mile northwest of Dee Cox Road	44.27	1,500	1,500	None	None	None	0
OR-74 (No. 52)	0.07 mile northwest of Fuller Canyon Road	44.70	1,600	1,600	1,600	1,535	1,912	+20
OR-74 (No. 52)	North city limits of Heppner	45.00	1,500	1,400	1,400	1,374	1,886	+26
OR-74 (No. 52)	0.02 mile north of Quaid Street	45.52	2,000	2,100	2,100	2,023	3,094	+55
OR-74 (No. 52)	0.02 mile south of Quaid Street	45.56	2,000	2,000	2,000	1,941	3,307	+65
OR-74 (No. 52)	0.02 mile north of Center Street	45.72	2,300	2,300	2,300	2,261	3,428	+49
OR-74 (No. 52)	0.02 mile south of Center Street	45.76	2,300	2,300	2,300	2,252	2,928	+27
OR-74 (No. 52)	0.02 mile north of Wasco-Heppner Highway (OR206/OR207)	45.87	2,100	2,000	2,000	1,966	2,704	+29
OR-74 (No. 52)	0.02 mile east of Wasco-Heppner Highway (OR206/OR207)	45.91	1,800	1,700	1,700	1,613	1,876	+4

Source: ODOT 2017, 2018, 2019, 2020, 2021

The number in parenthesis is the internal ODOT number designation for each state highway.

Table U-7 shows that from 2017 to 2021, ADT volumes increased by approximately 11 percent on average for I-84, while volumes for OR-207 and OR-74 roadway segments increased by approximately 25 and 27 percent, respectively, on average over the same time period.

OR-207 and OR-74, which generally carry much lower volumes than I-84 (1,602 and 2,194 average trips per day, respectively, compared to 17,843 average trips per day on I-84, as of 2021), saw an increase of 266 and 534 average trips per day, respectively, between 2017 and 2021. I-84 saw an increase of 1,726 average trips per day between 2017 and 2021.

Due to the rural nature of the analysis area, recent traffic counts for county roads that are proposed as transportation routes are not available. The counties do not monitor traffic volumes on a yearly basis. The most recent version of the Morrow County Transportation System Plan (Morrow County 2012) indicates that the County only has one year of traffic-count data (2005) for a select group of roadway segments in the County. Traffic data in the Transportation System Plan indicate that Bombing Range Road had an ADT of 1,250 in 2005, one of the highest counts of the roads included in the analysis (Morrow County 2012); no other ADT values were provided for the remaining county roads proposed as transportation routes. However, in general, traffic volumes on Morrow County roadways are low. Existing volume-to-capacity ratios are low for county roads, and thus it is assumed that existing capacity deficiencies on any county roadways are unlikely (Morrow County 2012). County roadway volumes are minimal, with some increase during the summer and early fall for harvest of various crops in the area.

Pavement Conditions

Pavement conditions can influence traffic safety issues. Poor pavement with potholes might cause vehicles to swerve, resulting in unsafe vehicle operation. ODOT's 2022 Pavement Condition data were reviewed for state highway transportation routes. Table U-8 shows the conditions for state highways anticipated to be used as part of the primary and alternate transportation routes.

Table U-8. Pavement Condition for State Highway Transportation Routes

Roadway	Approximate Milepost	Pavement Condition
I-84 (No. 6)	MP 167.58 to 179.45	Fair
I-84 (No. 6)	MP 179.45 to 184.60	Poor
I-84 (No. 6)	MP 184.60 to 188.60	Good
OR-207 (No. 333)	MP 12.59 to 17.81	Good
OR-207 (No. 320)	MP 0.00 to 10.15	Good
OR-207 (No. 320)	MP 10.15 to 19.53	Good
OR-207 (No. 320)	MP 19.53 to 27.24	Good
OR-74 (No. 52)	MP 36.45 to 38.82	Good
OR-74 (No. 52)	MP 38.82 to 45.38	Good
OR-74 (No. 52)	MP 45.38 to 45.89	Good
Source: ODOT 2022		

The majority of the state highway transportation routes are in good condition. There is a segment on I-84 with a fair rating, from approximately MP 167.58 to 179.45. A fair rating indicates minor or low severity pavement deficiencies that typically lead to treatment such as chip seal or light resurfacing (ODOT 2022b); however, fair conditions do not indicate a safety hazard.

Local county roadways are either paved or graveled, with Bombing Range Road being paved, and all of the remaining county roads being graveled.

Air Transportation

Aviation facilities within the analysis area including both public, private, and military include the following:

- West Buttercreek Airport, located 6.55 miles NE of the site boundary (private); and
- Lexington Airport, located 11 miles SW of the site boundary (public).

Federal Aviation Administration (FAA) and Oregon Department of Aviation (ODA) notification will occur prior to beginning construction of the Facility. The Applicant will use the FAA Notice Criteria Tool to identify if a Form 7460-1 is required. If required, the Applicant will submit FAA Form 7460-1 to the FAA and ODA in accordance with Oregon Revised Statute (ORS) 836.535(2)(a) requesting a determination of No Hazard in order to allow the agency to evaluate the effect of the proposed construction on air safety and navigable airspace. Following the submittal of the Facility's notice to the FAA and ODA, if required, the agency will conduct an aeronautical study.

A Determination of No Hazard to Air Navigation will be issued when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard but will not have a substantial aeronautical impact to air navigation. A Determination of No Hazard to Air Navigation may include conditional provisions, limitations to minimize potential problems, supplemental notice requirements, or requirements for marking and lighting, as appropriate. The Applicant will provide a record of all correspondence with FAA and ODA to the Oregon Energy Facility Siting Council.

2.3.2.7 Police Protection

Police service is primarily provided by county police departments; some of the communities in the analysis area have a community police department that operates within their respective communities but will not cover the site boundary. As necessary, the Applicant will seek assistance from the Morrow County Sheriff's Office, located in Heppner, Oregon. Additional law enforcement service is available through the Oregon State Police, with offices in Hermiston and Pendleton. Attachment U-3 is a record of correspondence with the Morrow County Sheriff's Office confirming that they can provide services in the analysis area.

2.3.2.8 Fire Protection

Fire protection service in the analysis area will be provided by the Ione Rural Fire Protection District and the Boardman Fire Rescue District. Attachments U-4 and U-5 are records of

correspondence with the Ione Rural Fire Protection District and the Boardman Fire Rescue District confirming that the construction and operation of the Facility will not impede their abilities to provide emergency services. As the site boundary is completely within the fire protection districts of Ione and Boardman, any emergency fire response would be by one of these rural fire protection districts, and any assistance by another fire department would be in the service of one of these rural fire protection districts.

2.3.2.9 Health Care

Because population density in the analysis area is relatively low, hospitals and health care services tend to be regional. There is one hospital within the analysis area, the Pioneer Memorial Hospital located 15 miles south in Heppner. The next nearest hospital to the Facility is the Good Shepherd Medical Center, located approximately 18 miles northeast in Hermiston. This hospital is also considered a Level III trauma center (Oregon Health Authority 2023). Ambulance service in the area is provided by the Morrow County Health District's Emergency Medical Services (Morrow County Health District 2023). Some of the nearby fire districts also have First Response Vehicles, with equipment and crew trained to stabilize a patient until the arrival of an ambulance for transport. In the event of a serious injury during construction or operation of the Facility, the patient may be flown by helicopter (operated by Life Flight) to one of the two Level 1 hospitals located in Portland: Oregon Health & Science University Hospital or Legacy Emmanuel Medical Center.

2.3.2.10 Schools

The analysis area falls within Morrow County School District No. 1. The Morrow County School District school closest to the Facility is the Sam Boardman Elementary School, located 14 miles north of the Facility site boundary. Ione School District consists of a single charter school with approximately 210 students in grades K-12, located 13 miles southwest of the Facility site boundary. Other nearby school districts that are outside of the 15-mile analysis area include the Hermiston, Stanfield, and Pendleton school districts in Umatilla County; and the Richland, Kennewick, Prosser, Kiona-Benton City, and Finley school districts in Benton County, Washington.

2.4 Potential Impacts on Public and Private Providers

OAR 345-021-0010(1)(u)(C) A description of any likely adverse impact to the ability of the providers identified in (B) to provide the services listed in OAR 345-022-0110;

OAR 345-021-0010(1)(u)(D) Evidence that adverse impacts described in (C) are not likely to be significant, taking into account any measures the applicant proposes to avoid, reduce or otherwise mitigate the impacts; and

2.4.1 Economic and Demographic Impacts

In total, the quantity of new temporary construction jobs and new operations jobs created from Facility construction and operations will represent less than 8 percent of total employment in Morrow County (a total of 8,415 jobs in Morrow County [U.S. Bureau of Economic Analysis 2022]). The jobs created by the Facility will result in short-term and long-term benefits to overall county employment. See Attachment U-1 for further background regarding workforce availability. Attachment K-1 provides additional information on economic impact from Facility construction and operations.

2.4.1.1 Population and Housing

Significant in-migration for construction-related employment and limited to moderate in-migration for permanent O&M employment are anticipated to occur as a result of the Facility. Temporary, in-migrant construction-related jobs are anticipated to last 21 months (per phase). During construction, in-migrant workers likely will stay at area motels or RV parks, eat at local restaurants, and purchase other amenities such as gas and groceries, all resulting in a beneficial impact on the local economy. As described in the economic impact analysis prepared for this Facility (Exhibit K, Attachment K-1), in addition to construction employment described separately, the construction-related per diem and other local expenditures would support an estimated 473 full-time equivalent direct jobs (accommodation, food and drink, retail, concrete manufacturing, equipment rentals, etc.) in Morrow County. Per diem and local construction-related expenditures would also support economic activity in other sectors that is anticipated to amount to approximately 69 additional full-time equivalent indirect and induced jobs, resulting in a total estimated labor income of approximately $28.8 million and total local economic output for the Facility of approximately $86.9 million (see Exhibit K, Attachment K-1 for details).

An estimated 10 permanent staff will be employed at the Facility for O&M of solar panels (including vegetation maintenance, panel and electrical maintenance, and all other related activities); additional workers could be needed for battery storage as described in the economic impact analysis. Some O&M staff will be hired locally, and some will be hired from outside the area for those positions that require previous experience at other solar generation facilities. It is assumed that these permanent O&M workers will live locally. Making the conservative assumption that 50 percent (5, worst-case) of the O&M positions are filled from outside the analysis area and the average household size is three, up to approximately 15 new permanent residents could be added

to the local population. That amount is small in comparison to the populations of Morrow, Umatilla and Benton counties (all within a commutable duration). Thus, it is not anticipated that the Facility will cause adverse impacts to communities within the analysis area.

Impacts on housing could occur if there were an inadequate supply of housing in relation to the demand from the new temporary and permanent residents associated with the Facility. Permanent housing for about 5 new households may be required, phased in as each successive phase starts operations. It is not yet known where the new temporary and permanent residents associated with the Facility will settle as well as what type of housing they will select. Housing impacts from construction and operations are described in Section 2.4.6.

2.4.1.2 Economic Activity and Tax Revenues

Revenue generated for the local economy will benefit public services, including schools and others services Morrow County offers to its citizens. Counties outside Morrow County would not gain revenue from Facility operation through tax payments, but would gain employment opportunities for residents from communities within those counties to be employed during construction and operation of the Facility. Income earned by those individuals due to the Facility will contribute to the local economy indirectly through local purchases. In addition, the Facility itself will purchase goods and services from local and regional businesses to the extent practicable, from Facility maintenance services to office equipment to business services. Lease payments to local landowners will also benefit the local economy because it is likely that a portion of the lease payments will be spent in nearby communities. These activities will result in a net inflow of dollars into the local economy that will have a beneficial effect beyond that of the new employment.

Attachment K-1 to Exhibit K provides a detailed assessment of economic activity resulting from Facility operations. Facility operation is anticipated to support approximately 47 direct, indirect, and induced jobs in Morrow County for the 40-year operating life of the Facility. The Applicant has entered into a long-term Payment in Lieu of Taxes (PILOT) agreement with Morrow County that provides for fixed payments of $7,000 per MW over a 17-year period, phasing in as each 200 MW phase comes online for a total of $8.4 million per year once all six phases are operational. Following expiration of the PILOT agreement, property taxes would increase to an estimated $14 million annually in Year 18, for an estimated total net value of $300 million over the life of the Facility (ECONorthwest 2023). These estimates do not include lease payments to local landowners.

Removal of approximately 9,400 acres of land, currently in cultivation for dryland wheat, from agricultural production would decrease agricultural economic activity in Morrow County. This impact, discussed in detail in Exhibit K and Attachment K-1, is anticipated to result in the removal of a total of approximately four jobs and about $300,000 in labor income per year.

2.4.2 Sewers and Sewage Treatment

The only sewage services required by the Facility during construction will be related to the handling of sewage from contract portable toilets. Portable toilet sewage will be pumped regularly

and disposed of at a local treatment facility. The Applicant will install wastewater facilities in the O&M buildings. The domestic-strength waste will be treated by the buildings' on-site, licensed septic systems at each of the O&M buildings. No other sewage treatment will be needed for Facility operations. Due to the distance to the nearest developed sewer system, the Applicant does not anticipate direct connection to sewers or sewage treatment facilities. Because the Facility's sewage needs will be minimal during both construction and operations, the Facility will not have any significant adverse impact on the ability of any community in the area to provide sewers or sewage treatment.

2.4.3 Water

As described in Exhibit O, an estimated 186.5 million gallons of water will be required for the Facility during construction. Most water required for construction will be used for dust control and compaction of access roads. Water for construction will be purchased from Stanfield Public Works, Boardman Public Works, and/or the Port of Morrow pursuant to existing municipal water rights held by the water utilities (see Attachments O-1, O-2, and O-3 in Exhibit O). The Facility's water demand will not injure the utilities' existing water right or exceed the amount of water available to the service provider (see Exhibit O). Alternatively, water may be provided by another source that has regulatory approval for construction use.

Kitchen and bathroom facilities will be installed in the O&M buildings. The Applicant expects to rely on exempt wells allowed under ORS 537.545 to provide water to the O&M buildings. Nominal amounts of water will be needed for domestic purposes (hand washing, drinking, toilets) and an on-site exempt well at each of the O&M buildings will cumulatively provide less than 5,000 gallons per day for domestic use. Given that the operational water needs of the Facility represent an insignificant fraction of the total municipal water use in the analysis area, existing water rights will not be negatively affected, and sufficient water will be available for the intended uses. Up to approximately 790,000 gallons per year may be required for module washing during operations. If water is needed for industrial uses, such as solar panel washing, it will come from the same sources as during construction i.e., from Stanfield Public Works, Boardman Public Works, and/or the Port of Morrow, or from or from another approved source with valid water rights. The Oregon Water Resources Department allows exempt well(s) to be used for long-term operational use such as for solar panel-washing as long as withdrawals maintain compliance with ORS 537.545(1)(f) by not exceeding 5,000 gallons per day for all wells combined without securing a withdrawal permit. Therefore, no adverse impacts to water use and supply are anticipated during construction or operations.

2.4.4 Stormwater Drainage

During Facility construction, stormwater drainage impacts could occur as a result of constructing new and improved roads, temporary construction areas, and concrete foundations. Adherence to the erosion control measures included in the Facility's NPDES Construction Stormwater Discharge General Permit 1200-C and accompanying ESCP will prevent adverse impacts related to

construction of these facilities. Exhibit I discusses the 1200-C permit in more detail. The site boundary is located in a rural area where existing stormwater infrastructure is limited to minimal facilities associated with public roads. Erosion control BMPs used during construction will not affect the provision of stormwater management services by any public agency and Facility components will be designed to maintain existing stormwater drainage patterns. The site boundary is not within a designated drainage district or urban area and is mostly vegetated, which serves as a buffer to promote infiltration and minimize erosion. Therefore, Facility construction will not alter existing drainage patterns and will not have an adverse impact on the ability of any community in the area to provide stormwater drainage.

Stormwater management infrastructure put in place during construction will be left in place as needed, to continue functioning throughout the life of the Facility where impermeable or semi-impermeable surfaces (e.g., access roads) remain to support O&M activities. Such features may include roadside ditches, infiltration swales, or retention basins. These facilities will be located on private land and will not affect the provision of stormwater management services by any public agency.

An industrial stormwater permit may be required for Facility operations for the purposes of solar panel washing. However, the permit may not be required if no ground-disturbing activities will occur during operations, no stormwater will be discharged to surface waters of the state, storm sewers, or dry wells, the washing will not use acids, bases, metal brighteners, steam, or heated water, and the area inside the Facility fence line will be revegetated as required by the NPDES Construction Stormwater Discharge General Permit 1200-C. No adverse impacts on the ability of any community to provide stormwater drainage are anticipated from Facility operations.

2.4.5 Solid Waste Management

Potential impacts on the ability of communities to provide solid waste management services could occur if the solid waste management needs from the Facility during construction or operations cannot be met through existing facilities or if meeting those demands interferes with the ability of service providers to meet other community waste management needs (e.g., if local landfill capacity is inadequate to handle the needs of the Facility). Most waste will be removed from the site and reused, recycled, or disposed of at the nearby Finley Buttes Regional Landfill if necessary. The Finley Buttes Regional Landfill has indicated that they have adequate capacity to serve the Facility and does not anticipate reaching full capacity for another 180 years (see Attachment U-2). As further described in Exhibit G, little construction waste will require off-site disposal, and only small amounts of solid waste will be generated during Facility operations. Solid waste disposal for the Facility during construction and operations will be provided through a private contract with a local, licensed commercial hauler or haulers and is not anticipated to disrupt services already being provided in any incorporated communities or in the larger Morrow County area. Additionally, as mandated by Morrow County's Solid Waste Management Ordinance, the Applicant will coordinate with waste and recycling franchisees servicing the Facility to maintain required records. The

Facility, therefore, will not have any significant adverse impact on the ability of any community in the area to provide solid waste management services.

2.4.6 Housing

Potential impacts to housing could occur if there were an inadequate supply of housing in relation to the demand from the new temporary and permanent residents associated with the Facility. It is not yet known where the new temporary and permanent residents will settle and what type of housing they will select. See Attachment U-1 for a detailed analysis of housing availability and associated impacts.

2.4.6.1 Construction Impacts

Based on the projected Facility employment and population amounts, additional temporary housing could be required for up to 950 new individuals during the peak construction period and up to about 535 new individuals on average (for construction of both the solar facility and BESS) during the 47-month construction period. This is based on the conservative assumption that no construction workers will be hired locally (in accordance with the Project Order; ODOE 2022) and therefore all construction workers would be from outside the assumed 60-minute commuting duration and would require temporary accommodation. The actual number of temporary residents may be fewer if locals are hired. Note that Attachment U-1, Section 2, Analysis of Workforce Availability provides detailed reasoning for why local hiring is likely higher than this, potentially reaching greater than 50 percent of the needed workforce (depending on unemployment rates for applicable occupations, etc.).

If all construction workers sought temporary housing within the 15-mile analysis area, there would not be enough supply to meet that demand, and mitigation, such as additional on-site temporary housing facilities, would be required to diminish the significant housing impact to local communities. However, this cannot be assumed to occur. Industry experience indicates that construction workers are unlikely to relocate if commuting to work is an option, and that commuting a couple of hours or more is common. Therefore, a 60-minute commute duration is a conservative estimate based on keeping commute times to an hour or less. That distance includes communities in Umatilla and Gilliam counties, Oregon, and in Benton and Franklin counties, Washington, that have greater housing availability as noted above. Some of these options include other amenities when compared to options within 15 miles, which may attract workers in need of temporary housing. Although it cannot be assumed that housing facilities will have vacancies at any given time, adequate supplies are available within a commutable duration in relation to the number of temporary workers. The analysis of rental and transient lodging supply shows that the region can potentially supply 1,458 rental housing units and 1,621 transient lodging units, for a total of 3,079 units of total housing (see Section 2.3.2.5 and Attachment U-1). This is well above the maximum estimates of housing unit demand, i.e., up to 950 units. Thus, it is likely that within the region, the housing market could accommodate the anticipated influx of non-local construction workers.

For workers requiring transient lodging, the market also has capacity to accommodate the demand, even at peak occupancy rates during the summer season, assuming many of the workers would locate in Umatilla County or in the Tri-Cities area (see Section 2.3.2.5 and Attachment U-1). Hotels and motels are substantially more available than RV sites. Workers who prefer to stay in an RV may have difficulty finding full-hookup sites in Oregon during most of the year, especially during the summer months (see Attachment U-1).

Workers who plan to work on the Facility for more than a year during the 47-month construction period could enter a year-long lease and may prefer rental housing over transient lodging. However, the anticipated influx of demand would likely create substantial upward pressure on rent in the already tight rental housing markets of Morrow and Umatilla Counties (see Section 2.3.2.5 and Attachment U-1). Due to these constrained market conditions, workers for the Facility would likely follow location patterns already observed for workers at nearby, major regional employers such as the Port of Morrow, where substantial amounts of the workforce commute from the Tri-Cities (see Section 2.3.1; WSP and FCS Group 2020).

While the regional supply of housing can likely accommodate Facility-related demand, the housing supply in Morrow County alone cannot accommodate all workers at peak construction in any scenario except in the case where the BESS is not constructed and assuming double occupancy. In this scenario, worker demand for housing at double-occupancy is approximately equal to vacant housing supply in Morrow County. Hypothetically, Morrow County has the ability to absorb about 150 workers, assuming double-occupancy in transient lodging. If rental vacancy is the same at the time of construction (see Section 2.3.2.5), another 150 workers could be housed in apartments and rental houses at double occupancy. However, this would consume all available lodging and displace demand generated through natural population growth and other economic development activity likely to occur through 2030 (see Attachment U-1). Even if new housing is created in Morrow County, it is unlikely to materialize at a pace that would substantially relieve the market pressures that the Facility-related housing demand would create. It may, however, create opportunities for existing residents who could rent rooms in their homes and generate income. This is a common market response to increased temporary housing demand in tight markets and may help ease pressure on the market in Morrow County (see Attachment U-1).

Note that although sufficient housing supply is projected to meet peak project demand within the region, the housing markets closest to the Facility (i.e., Morrow and Umatilla counties; see Attachment U-1) have the potential to be constrained as a result of the Facility-related housing demand. Therefore, the following mitigation measures may be implemented to minimize impacts as necessary (see Attachment U-1 for further detail):

- Develop a detailed housing plan consistent with updated workforce estimates prior to construction.
- Provide housing information to workers prior to the start of their employment.
- Hire a housing coordinator to manage housing-related planning and communication with employees, housing providers, and local officials.

- Work proactively with incoming workers to identify housing options and minimize potential issues finding suitable and affordable housing (taking into consideration commuting and transportation).
- Consult with cities as well as the county as necessary regarding temporary housing options prior to construction.
- Continue to work with local officials such as the Morrow County Planning Department, nearby cities and towns such as Lexington and Ione, the Boardman Community Development Association, the Willow Creek Valley Economic Development Group, and other housing providers to obtain current information and to ensure information provided to workers is consistent with local housing policies and objectives.
- Include in the Conditional Use Permit filing a list of Morrow County parcels zoned Exclusive Farm Use located outside the site boundary that may be candidates for RV park development.
- Work with local officials to preemptively address potential issues related to constraints on RV sites and hookups.
- Partner with local private entities as appropriate to support permitting for additional RV facilities to support housing for Facility construction employees.
- Work with Facility contractors to track and assess non-local worker demographics to identify patterns of use and proactively identify potential shortages or changes in housing demand.
- Consider providing support to local housing advocacy organizations to augment resources available to low-income residents.

With the implementation of these mitigation measures, no significant adverse housing impacts from Facility construction are anticipated.

2.4.6.2 Operation Impacts

Permanent housing for up to 10 new households (with up to three people per household) may be required starting at the beginning of operations. For the estimated 30 new permanent residents expected because of Facility operations, it is anticipated that adequate opportunities will be available to purchase housing or to construct new housing in the analysis area, or within a commutable duration from the Facility outside of the analysis area. Given the reasoning described in this section as well as the general availability of housing opportunities, no significant adverse impacts on the ability of communities to provide housing are anticipated from Facility construction or operations.

2.4.7 Transportation: Traffic Safety and Roadway Impacts

2.4.7.1 Construction Impacts

A detailed Traffic Impact Assessment (TIA) is provided as Attachment U-6 to this ASC, in accordance with the requirements set forth in Morrow County Zoning Ordinance Article 6, Section 6.030. The TIA is required for the level of traffic anticipated during construction only. The information below summarizes the detail provided in the TIA.

Traffic Volumes

It is estimated that an average of 910 construction worker commuter trips per day (455 roundtrips), with a peak of 1,266 trips (633 roundtrips), will be needed over approximately 1,224 construction workdays (about 47 months). This is based on the estimated average (682) and maximum (950) workforce, with a carpool factor of 1.5 persons per vehicle. The majority of these trips are commuting trips by the workforce followed by material deliveries, construction equipment deliveries, and water trucks. Truck deliveries are additionally estimated as an average of 250 trips per day (125 round trips). Therefore, the total average number of trips per day is 1,160, and the anticipated maximum number of trips per day is 1,516.

I-84 and Bombing Range Road will see the largest number of trips, as delivery of aggregate, concrete, and water may originate from these roads and most of the communities likely to provide temporary housing are located along or near these roads. Overweight or oversize deliveries, such as the transmission line poles and main power transformers, will be delivered via this route. As noted earlier, workforce traffic will also be divided among the primary and alternate routes, with some traffic also using OR-74 from south of the Facility up to OR-207.

As described in Section 2.3.2.6, in 2021 I-84 carried an ADT volume of approximately 14,529 vehicles between Boardman and the Hermiston Highway Interchange (OR-207), Oregon. Based on the above ADT estimates, for the construction period, construction vehicles could cause an average increase to 15,439 if 100 percent of the average construction traffic uses this route, which is a total increase of about 6.3 percent. This increase is expected to be inconsequential.

Along Bombing Range Road at peak construction, ADT could increase by as much 1,520 vehicles at the peak. However, given the lack of recent ADT information for Bombing Range Road (2005 ADT data, Morrow County 2012; Section 2.3.2.6), this impact cannot be quantified. Due to the size of the roadway and its paved condition, it is assumed that the impacts to Bombing Range Road due to the Facility's construction traffic will mainly be safety related. The traffic volume impacts will be intermittent, mainly occurring during peak commuting times. During the morning peak hour, workforce commuters would be traveling south on Bombing Range Road to turn left on to Grieb Road. The high number of slowing and left-turning vehicles could increase the potential for rear-end collisions. However, this concern can be mitigated using appropriate signage and safety measures. Also, some of the estimated construction traffic will likely be using an alternate route through OR-74 or OR-207, so this maximum increase is unlikely to occur.

On the alternate transportation route, peak construction trips will increase ADT volumes on a majority of the OR-207 (between I-84 and Lexington) by an average of 140 percent if all of the construction traffic used the alternative route. This increase is higher south towards OR-74 and Lexington. The increase is lower towards the north at I-84. During the non-peak construction, the ADT increase is anticipated to be around 108 percent. The maximum increase could cause short term delays, however the actual volume of construction traffic using this alternative route should be minimized, and will be considerably lower than this value. Traffic impacts are anticipated to be temporary, intermittent, and minimal due to most construction traffic occurring during non-peak recreational hours (i.e., weekend) and an alternate transportation route being available.

On the alternate workforce traffic route along OR-74 between Heppner and Lexington, approximately 10 percent of the workforce is assumed to use this route. Ten percent of construction vehicles using this alternative route will increase the ADT by 3.4 to 11.3 percent on average. The OR-74 road segment with the greatest potential for impact is the section just northwest of the Lexington-Echo Highway (milepost 36.40), which could see as much as a 15 percent ADT increase with peak construction. Similar short-term/intermittent delays could occur during construction in this section, but will occur during non-peak recreational hours, as addressed above. Because this is the alternative workforce route, it is highly unlikely that this route will see 100 percent of workforce traffic.

There will be an entrance to the site along Grieb Lane but there are no ADT values currently available. Due to the area being rural and not heavily traveled, the main concern along this route would be the potential for rear-end collisions from drivers not expecting vehicles to turn left on to Grieb Lane during the morning peak hour. This safety concern can be mitigated with warning signage denoting a construction entrance and signage warning of slowing and turning traffic.

While construction-related traffic may cause short-term traffic delays (because of large, slow-moving delivery trucks and increased congestion), the delays will be temporary and can be minimized by implementing the Construction Traffic Management Plan (see Attachment U-7), which includes the following measures as necessary:

- Coordinate the timing and locations of road closures or oversize load movements in advance with emergency services such as fire, paramedics, and essential services such as mail delivery and school buses. The Applicant will fill out a permit to haul overweight vehicles via a restricted road application through Morrow County. The Applicant may contact eimes@co.morrow.or.us for further communication on road closures. ODOT or the County may request a Traffic Control Plan to ensure safety of drivers and construction vehicles should construction along the roadway be required for site entrances.
- Maintain emergency vehicle access to private property.
- Minimize movements of normal heavy trucks (dump trucks, concrete trucks, standard size tractor-trailers or flatbeds, etc.; essential deliveries only) and prohibit movements of oversize trucks, to the extent practicable, during peak traffic times.

- Develop plans as required by county or state permit to accommodate traffic where construction would require closures of state- or county-maintained roads for longer periods.
- Consult with and notify the landowners prior to the start of construction to minimize disruptions to ranching and farming operations (e.g., harvest time activities requiring tractor movement between fields or trucks delivering agricultural products to market) due to construction activities.
- Post signs on county- and state-maintained roads, where appropriate, to alert motorists of construction and warn them of slow, merging, or oversize traffic.
- Use of flaggers for traffic signalization on a daily basis is not anticipated as road and right-of-way work will be minimized to avoid changes in traffic patterns. The commuting hour construction traffic may experience slowdowns near the Facility site since they are going to the same location. However, the Facility site is very rural and existing traffic is below the road capacity; thus, there is no need for temporary flagging to improve operations during the commuting hour. Maintain at least one travel lane at all times so that roadways will not be closed to traffic due to construction vehicles entering or exiting public roads.

The Draft Construction Traffic Management Plan provided as Attachment U-7 will be reviewed and updated prior to construction based on input from the Oregon Department of Transportation and the Morrow County Road Department. In addition, a Road Use Agreement will be established with the Morrow County Road Department to ensure that public roads impacted by Facility construction and operation will be left in "as good or better" condition than that which existed prior to the start of construction. A draft agreement provided by Morrow County Public Works is provided as Attachment U-8 and will be finalized prior to construction.

Therefore, with the above measures and development of a Construction Traffic Management Plan as part of the Road Use Agreement with Morrow County, no significant adverse traffic impacts are expected from construction of the Facility.

Traffic and Design Standards

Traffic Standards

State highways are designed and constructed to handle legal loads of 80,000 pounds without a permit. During construction, it may be necessary for trucks exceeding the legal load limit to access the site via state highways. These trucks would potentially be used to deliver the substation transformers or heavy construction equipment. Before construction, the transportation contractor will consult with the Morrow County Road Department and ODOT to determine whether any segments of roadway or bridges are restricted for travel, and to obtain any oversize/overweight permits required to allow transport of these loads. There are no permanent restrictions on state highways proposed for transportation routes. Because the state highways are built to accommodate overweight vehicles with permits, impacts to safety or roadway pavement conditions are not expected. With the exception of a 5 mile section of I-84 in poor condition, the primary and alternate

transportation routes have very good or good pavement conditions, with two segments of fair condition (see above Section 2.3.2.6). Vehicles up to 75 feet in length are allowed without special permitting on the primary and alternate transportation routes. There are requirements imposed by Morrow County and ODOT, such as the previously referenced Road Use Agreement, to promote traffic safety and prevent cumulative damage to the pavement along the transportation routes identified in this exhibit.

Design Standards

County and local roadways are expected to safely accommodate Facility construction traffic. Note that no county or local roadways are anticipated to require improvement prior to construction. Note that road conditions could change, thus the Road Use Agreement will reflect what is actually needed at the time of preconstruction compliance for the Facility. To ensure the integrity of local roads, the Applicant will coordinate with local transportation officials to make improvements where necessary to accommodate Facility construction traffic, and improvements will be restricted to areas within the respective rights-of-way.

The Applicant will work with ODOT and the Morrow County Road Department to ensure that any unusual damage or wear to state or county roads that is caused by Facility construction is repaired by the Applicant. All county roads on the primary transportation route will be evaluated prior to and after construction of the Facility to determine what, if any, degradation has occurred. Inspections will include monitoring of roadway conditions after the completion of construction activities. Monitoring may include the use of video footage, photographs, and engineer field notes to document road conditions. During construction of the Facility, the contractor will obtain authorization from ODOT and Morrow County before proceeding with overweight loads on state- or county-maintained roadways. The Applicant will strictly abide to travel conditions and transportation equipment requirements enforced by either ODOT or Morrow County. Upon completion of construction, the Applicant will restore county roads to their pre-construction condition or better, to the satisfaction of the County Road Department. Regardless of existing pavement conditions, roadway segments will be reviewed prior to any added construction traffic, and a system for monitoring safety or degradation to pavement will be developed for the necessary roadways prior to construction. The Applicant will ensure that the construction and operation of the Facility will maintain ODOT's and Morrow County's road systems in as good or better quality than prior to the Facility's construction.

2.4.7.2 Operation Impacts

Operational traffic impacts associated with the Facility are not expected. Operational trips would include employees traveling to work in their personal vehicles, as well as specialized personnel who may travel in light-duty trucks. As stated previously, 10 full-time staff may be employed during Facility operations. The occasional delivery truck may also access the site during operations. Daily traffic generated by this Facility is not expected to affect operations on any of the state or county roads, since operations vehicles will constitute a tiny fraction of the daily traffic.

Thus, adverse operational impacts to traffic safety or travel times from the Facility are not anticipated. Therefore, adverse impacts to the transportation network are not anticipated during operation of the Facility.

2.4.7.3 Air Transportation

The Facility does not meet the notice criteria based on FAA-identified impact areas, and therefore formal submission of a Form 7460-1 to the FAA under Code of Federal Regulations (CFR) Title 14 Part 77.9 (Safe, Efficient Use, and Preservation of the Navigable Airspace) is not anticipated. The Facility does not meet the first threshold for notice. No airports (or their adjoined runways) are within 3.8 miles of the site boundary (per the second threshold for notice to the FAA, 14 CFR Subpart B Section 77.9). The FAA has developed Technical Guidance for Evaluating Selected Solar Technologies on Airports (FAA 2018), in addition to FAA regulatory guidance under 78 Federal Register 63276 Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports (collectively referred to as FAA Guidance). The FAA Guidance recommends that glare analyses should be performed on a site-specific basis using the Sandia Laboratories Solar Glare Hazard Analysis Tool. This guidance applies to solar facilities located on federally obligated airport property; it is not mandatory for a proposed solar installation that is not on an airport, such as the proposed Facility.

2.4.8 Police Protection

Potential adverse impacts on the ability of communities to provide police protection could result if the Facility itself caused an increased need for police services (e.g., from vandalism or other crime during construction or operations) or if the additional temporary or permanent population from the Facility resulted in such increased need. The additional temporary and permanent workforce is not expected to create any significant concerns. The Applicant will provide 24-hour on-site security such as cameras with remote monitoring during construction and effective communications will be established between on-site security personnel and the Morrow County Sheriff's Office. As necessary, back-up law enforcement will be available from the Oregon State Police, with offices in Hermiston and Pendleton. The moderate number of new temporary construction residents and relatively small number of new permanent residents are not expected to place significant new demands on police in the area. The Morrow County Sheriff has indicated that they can provide services to the Facility without impacting their current customer service base (Attachment U-3). Therefore, the Facility will not have a substantial adverse impact on the ability of local communities to provide police protection or law enforcement services.

2.4.9 Fire Protection and Emergency Response

Potential adverse impacts on fire protection services could result if Facility construction or operation or the increased population associated with either caused an increase in fires or other needs for fire protection services beyond the ability of local fire departments to provide those services. During Facility construction, there could be some risk of accidental grass fires on the site

due to metal cutting, welding, smoking, refueling vehicles and equipment, and operating or parking vehicles and other equipment off roadways in areas of tall dry grass. Solar panels contain a number of safety features designed to provide increased fire protection. The BESS also introduces an element that could pose a fire hazard, specifically if lithium-ion batteries are selected. Lithium-ion batteries must be kept in a temperature-controlled facility with individual battery modules isolated to prevent the spread of fire if it were to occur. The lithium-ion BESS will incorporate a fire response system as designed by the battery manufacturer. During the operational phase of the Facility, fire danger will be minimal. The zinc-based batteries under consideration for this Facility are non-flammable and tolerate wide temperature ranges. As a result, the manufacturer affirms that they are not anticipated to present a fire hazard and do not require on-site fire suppression systems.

The following measures could be implemented to minimize fire and safety risks:

- Adequate firefighting equipment and water supplies will be maintained and made available during operations that carry a high fire risk (e.g., metal cutting, welding, parking in high, dry grass).
- The solar array will have shielded electrical cabling to prevent electrical fires.
- The collector system and substations will have redundant surge arrestors to deactivate the Facility during unusual operational events that could start fires.
- Facility infrastructure will be spaced sufficiently (fire breaks) to prevent the spread of fire.
- A non-flammable gravel base will be installed around the solar inverters, substations, and BESS.
- All electrical equipment will meet National Electrical Code and Institute of Electrical and Electronics Engineers standards.
- Smoke/fire detectors will be placed around the site that will be tied to the Supervisory Control and Data Acquisition system and will contact local firefighting services.
- Vehicles and equipment will drive and park on maintained graveled areas and roads to the extent practicable; roads will be established before accessing the site to keep vehicles away from grass.
- Vehicles will avoid idling in grassy areas, and cutting torches and similar equipment will be kept away from grass.
- Diesel vehicles will be used whenever practicable to prevent potential ignition by catalytic converters.
- Facility roads will be sufficiently sized for emergency vehicle access.
- Fire prevention and response training will be administered annually to all on-site employees. O&M staff will be trained in the use of fire extinguishers for responding to incipient stage fires on site.

- A Facility Site Plan will be submitted to fire protection officials including current contact information for personnel.
- A Health and Safety Plan as well as an Emergency Response Plan will be developed with response procedures in the event of an emergency, such as a fire.
- Off-site, 24-hour monitoring of the BESS will be implemented and will include shutdown capabilities.
- The BESS will be stored in completely contained, leak-proof modules, and will be inspected regularly according to the manufacturer's recommendations.
- Transportation of lithium-ion batteries is subject to 49 CFR 173.185 – Department of Transportation Pipeline and Hazardous Material Administration. This regulation contains requirements for prevention of a dangerous evolution of heat; prevention of short circuits; prevention of damage to the terminals; and prevention of batteries coming into contact with other batteries or conductive materials. Adherence to the requirements and regulations, personnel training, safe interim storage, and segregation from other potential waste streams will minimize any public hazard related to transport, use, or disposal of batteries.
- Design of BESS will be in accordance with applicable Underwriters Laboratories (specifically, 1642, 1741, 1973, 9540A), National Electric Code, and National Fire Protection Association (specifically 855) standards, which require rigorous industry testing and certification related to fire safety and/or other regulatory requirements applicable to battery storage at the time of construction.
- The portions of the Facility that will be graded will be replanted with a low-growing mix of grasses and forbs.
- The site will be mowed as needed for fire safety requirements and to keep vegetation from interfering with O&M activities.
- A 5-foot maintained vegetative surface or noncombustible base, approved by the fire code official, will be maintained along the fenced perimeter of the site boundary.
- A physical vegetation survey assessment of the fenced area will be completed at least twice a year (and seasonally as needed during heightened fire risk) to monitor for vegetation clearances, maintain fire breaks, as applicable, and monitor for wildfire hazards.
- The programs outlined in Exhibit V, Section 4.2 will be implemented to minimize fire risk during operations.

Statements from the Ione Rural Fire Protection District and Boardman Fire Rescue District indicated that they had no concerns with Facility construction or operations with respect to providing fire protection services (see Attachments U-4 and U-5). As the site boundary is completely within the fire protection districts of Ione and Boardman, any emergency fire response would be by one of these rural fire protection districts, and any assistance by another fire department would be in the service of one of these rural fire protection districts.

The moderate number of new temporary construction residents and relatively small number of new permanent residents are not expected to place significant new demands on the fire protection forces that serve the area. For the reasons provided above, the Facility will not have an impact on the ability of surrounding communities to provide fire protection and emergency response services during construction or operations.

2.4.10 Health Care

Impacts to health care could occur if Facility construction activities or increases in temporary residents (during construction) and permanent residents (during operations) resulted in an increase in the use of emergency and routine health care services that exceeded the current capacity of local providers. However, due to the moderate number of new temporary construction residents and relatively small number of new permanent residents, significant new demands are not anticipated to health care facilities that serve the area. Therefore, no significant adverse impacts on the ability of communities to provide health care are anticipated as a result of Facility construction or operation.

2.4.11 Schools

Construction workers are expected to rotate through for the various phases of Facility construction. As a result, few workers will bring their families with them, and few if any school-aged children are expected in association with Facility construction. Additionally, construction traffic is unlikely to conflict with school bus routes and schedule. Therefore, little to no construction-related impacts on schools will result.

With the assumption that up to 10 new permanent households will result from the Facility, an estimated maximum of 15 new schoolchildren (conservatively assuming 1.5 school-aged children per household) could move to the analysis area. Approximately 210 students and 341 students are currently enrolled at the Ione High School and Sam Boardman Elementary School, respectively, both within the analysis area. The schools can accommodate the addition of 15 students, or slightly greater than a 2 percent increase over the current combined population of 651 students. Additionally, there are many other schools that can accommodate new schoolchildren outside the 15-mile analysis area, where some of the new O&M workers are likely to locate. As such, Facility operation is not anticipated to have an adverse impact on schools.

Little to no demand for school facilities is expected during Facility construction, and only minimal demand is anticipated from the small increase in local population from new permanent employees during Facility operations. The actual impacts on schools will dependent upon the housing choices of the new residents and their children, which are currently unknown. Given the relatively rural, dispersed area in which new residents are likely to settle, the relatively small number of expected new schoolchildren, and the number of schools available, it is unlikely that any one school will receive more new students than they are able to accommodate. Therefore, no significant adverse

impacts on the ability of communities to provide school services are anticipated as a result of Facility construction or operation.

2.5 Proposed Monitoring Programs

OAR 345-021-0010(1)(u)(E) The applicant's proposed monitoring program, if any, for impacts to the ability of the providers identified in (B) to provide the services listed in OAR 345-022-0110.

The Facility will not result in significant adverse impacts to the ability of service providers identified in Section 2.3 to provide services in the analysis area. Therefore, a monitoring program is not proposed.

3.0 Conclusion

This exhibit provides the required information pursuant to OAR 345-021-0010(1)(u) and approval standard OAR 345-022-0110. Based on the evidence presented in this Exhibit U, the Applicant has demonstrated that the construction and operation of the Facility, taking into account mitigation, is not likely to result in significant adverse impacts on the ability of the providers within the analysis area to provide the following services: sewers and sewage treatment, water, stormwater drainage, solid waste management, housing, traffic safety, police and fire protection, healthcare, and schools.

4.0 Submittal Requirements and Approval Standards

4.1 Submittal Requirements

Table U-9. Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(u) Information about significant potential adverse impacts of construction and operation of the proposed facility on the ability of public and private providers in the analysis area to provide the services listed in OAR 345-022-0110, providing evidence to support a finding by the Council as required by 345-022-0110. The applicant must include:	–
(A) The important assumptions the applicant used to evaluate potential impacts;	Section 2.2
(B) Identification of the public and private providers in the analysis area that would likely be affected;	Section 2.3
(C) A description of any likely adverse impact to the ability of the providers identified in (B) to provide the services listed in OAR 345-022-0110;	Section 2.4
(D) Evidence that adverse impacts described in (C) are not likely to be significant, taking into account any measures the applicant proposes to avoid, reduce or otherwise mitigate the impacts; and	Section 2.4
(E) The applicant's proposed monitoring program, if any, for impacts to the ability of the providers identified in (B) to provide the services listed in OAR 345-022-0110.	Section 2.5

4.2 Approval Standards

Table U-10. Approval Standard

Requirement	Location
OAR 345-022-0110 Public Services	
(1) Except for facilities described in sections (2) and (3), to issue a site certificate, the Council must find that the construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to the ability of public and private providers within the analysis area described in the project order to provide: sewers and sewage treatment, water, storm water drainage, solid waste management, housing, traffic safety, police and fire protection, health care and schools.	Sections 2.0 through 3.0
(2) The Council may issue a site certificate for a facility that would produce power from wind, solar or geothermal energy without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.	Sections 2.0 through 3.0
(3) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.	N/A

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Figures

Sunstone Solar Project

Figure U-1
Analysis Area

MORROW COUNTY, OR

- Site Boundary
- Analysis Area (15-mile Buffer)
- City/Town
- County Boundary
- State Boundary
- Interstate Highway
- US Highway
- State Highway
- County Highway
- Existing UEC Transmission Line

TETRA TECH

PINEGATE RENEWABLES

Reference Map

Klickitat County
WASHINGTON
Benton County
Alderdale
Boardman
Hermiston
Stanfield
OREGON
Echo
Nolin
Cecil
Gilliam County
Umatilla County
Ione
Morrow County
Lexington
Heppner
14
84
30
74
82
395
730
908
816
930
687
689
584
1198
320
578
207
735
813
206

1:240,000 WGS 1984 UTM Zone 11N

0 2.5 5 10 15 20 Miles

NOT FOR CONSTRUCTION

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Sunstone Solar Project

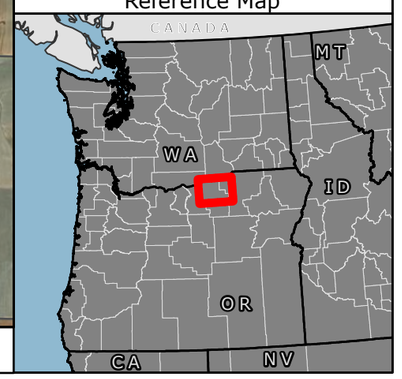
Figure U-2
Primary and Alternate Construction Transportation Routes

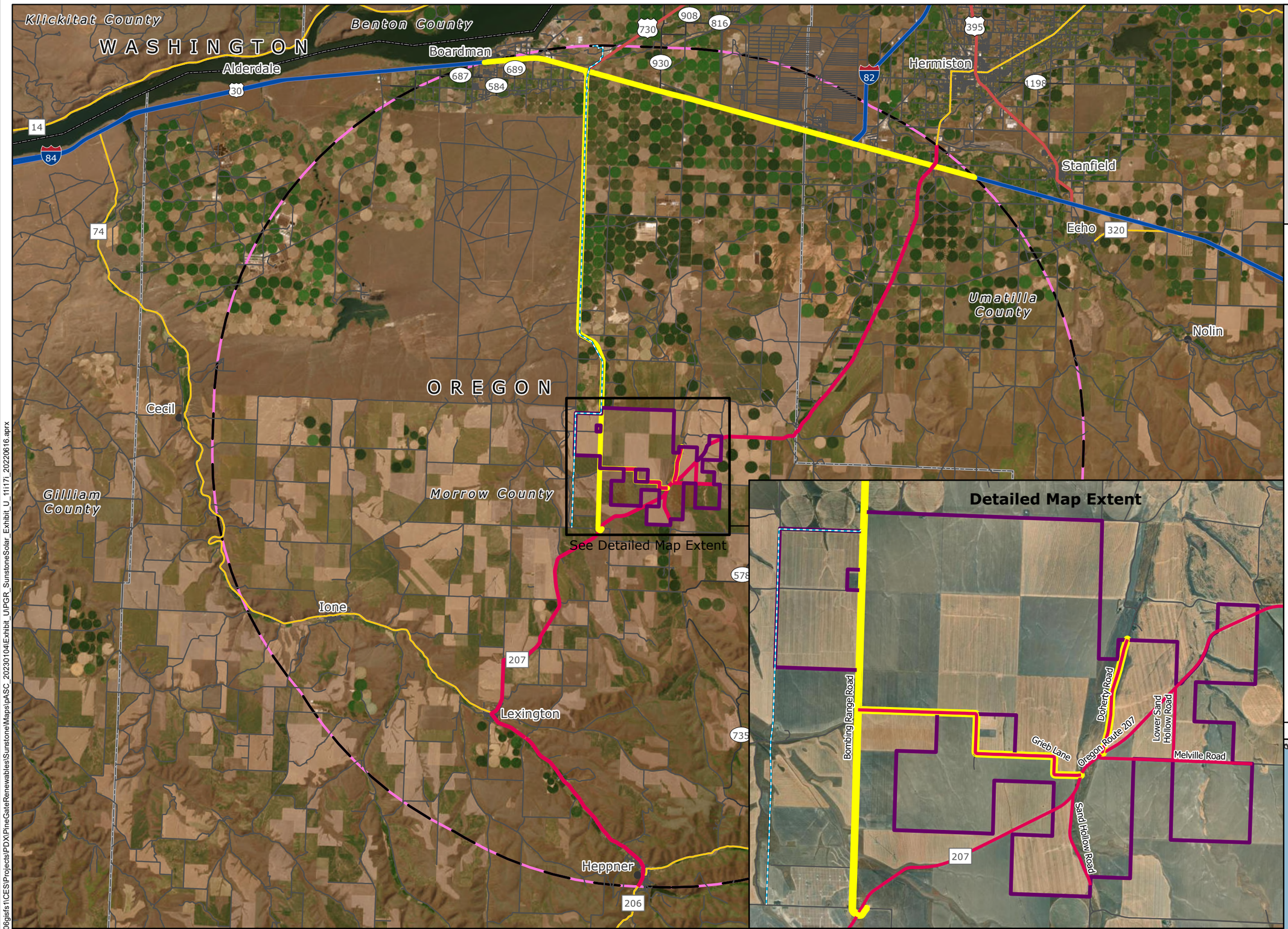
MORROW COUNTY, OR

- Site Boundary
- Analysis Area (15-mile Buffer)
- Primary Transportation Route
- Alternate Transportation Route
- City/Town
- County Boundary
- State Boundary
- Interstate Highway
- US Highway
- State Highway
- County Highway
- Local Roads
- Existing UEC Transmission Line

TETRA TECH PINEGATE RENEWABLES

Reference Map





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Attachment U-1. Sunstone Solar Project Workforce and Housing Availability

Sunstone Solar Project
Workforce and Housing Availability

June 2023

Prepared for: Tetra Tech, Inc.

Draft Report

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Acknowledgements

For over 40 years ECONorthwest has helped its clients make sound decisions based on rigorous economic, planning, and financial analysis. For more information about ECONorthwest: www.econw.com.

ECONorthwest prepared this report for Tetra Tech, with the support of Tetra Tech staff and input from staff of Pine Gate Renewables LLC. ECONorthwest is responsible for the content of this report. That assistance notwithstanding, the staff at ECONorthwest prepared this report based on their knowledge of economics and economic tools and models, natural resources, and energy, and on information derived from government agencies, private statistical services, the reports of others, interviews of individuals, and other sources believed to be reliable. Any statements nonfactual in nature constitute the authors' current opinions, which may change as more information becomes available.

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Table of Contents

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Executive Summary

Sunstone Solar, LLC (Sunstone Solar), a subsidiary of Pine Gate Renewables, LLC (PGR), is proposing to construct and operate the Sunstone Solar Project (Project or Facility), an up to 1,200 megawatt (MW) alternating current (AC) photovoltaic (PV) solar energy generation facility in Morrow County, Oregon (Figure 1). The Project also includes two interconnection switchyards, six collector substations, up to four operations and maintenance (O&M) buildings, and other structures including overhead transmission lines, roads, perimeter fencing, and gates. The project may also include a distributed battery energy storage system (BESS). PGR is presently seeking to permit a range of PV and related or associated technology within the Project site boundary to allow for micrositing flexibility. For the purposes of analysis, PGR has developed a representative development scenario that assumes the Project would be built in six overlapping phases of 200 MW each, with construction anticipated to start in April 2026.

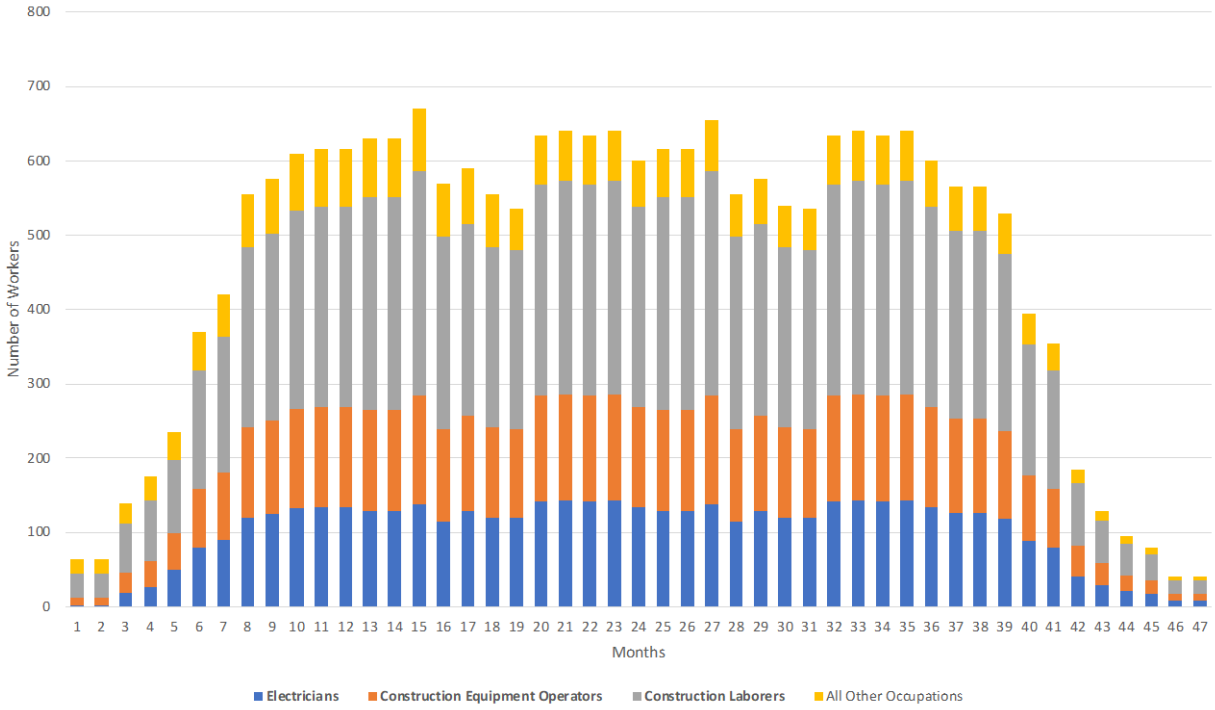
This report is prepared on behalf of PGR to assess regional workforce availability, housing availability, and housing impacts. The regional workforce availability analysis informs PGR of labor market conditions and the potential to hire local labor for project construction. Workforce availability is contextualized within a regional labor market which encompasses counties in both Oregon and Washington. The housing availability and impact analysis compares the supply of housing by type with potential demand generated from project employment, describes potential capacity constraints and local impacts, and offers potential mitigation options commonly used on other similar projects. Housing availability is assessed for Morrow County and the surrounding counties in Oregon and Washington that are included in the regional labor market.

Workforce Availability Analysis

PGR anticipates that project construction will occur in six phases over a four-year period, with each phase consisting of similar arrangements and quantities of labor. The construction of a PV solar energy generation facility relies on a mix of skilled and unskilled labor, including but not limited to general construction workers, civil engineers, electricians, and specialty construction equipment operators, as well as surveyors, health and safety specialists, and construction managers. In a modeled scenario, most of the workforce—approximately 50 percent—will consist of construction workers. Electricians and construction equipment specialists will constitute an additional 22 percent each of the anticipated total. Figure ES-1 shows the distribution of labor over time for the solar generation facility. Adding the BESS would add about 140 workers per phase and increase the peak workers for both project components to about 950.

Figure ES-1. Estimated Workforce by Occupation, PV Solar Generation Facility

Source: ECONorthwest analysis of PGR data



The relevant local labor market for the project encompasses a commute of up to 60 minutes, a geography that includes Gilliam, Morrow, and Umatilla counties in Oregon and Benton and Franklin counties in Washington. There are approximately 12,419 workers employed in relevant occupations within this area. More than half of these workers are in Benton County, while just 2 percent are in Morrow County (Table ES-1).

Table ES-1. County Employment by Occupation

Source: IMPLAN, Occupation Detail, 2021

SOC Code	Occupation Description	Oregon			Washington		Total Region
		Morrow	Gilliam	Umatilla	Benton	Franklin	
47-2111	Electricians	16	5	140	620	231	1,012
47-2070	Construction Equipment Operators	13	8	105	506	154	786
47-2061	Construction Laborers	16	12	191	1,064	353	1,636
17-1022	Surveyors	0	0	4	61	7	72
47-1011	Craft Supervision	13	11	138	763	239	1,164
11-9021	Construction Managers	5	3	54	300	99	461
43-1000	Administrative Assistant	46	9	272	870	281	1,478
49-9051	Power Line Installers	12	1	44	213	67	337
17-2051	Civil Engineers	4	2	47	341	62	456
47-2051	Concrete Finishers	3	2	35	189	71	300
47-4011	Construction Inspector/Engineers	3	1	24	93	21	142
29-9011	Health and Safety Specialists	-	-	-	-	-	-
53-3032	Truck Drivers	116	43	761	1,667	913	3,500
47-2000	Other Construction	10	6	139	672	248	1,075
Total		**258**	**103**	**1,952**	**7,359**	**2,747**	**12,419**

Note: the total employment for these occupations in the labor shed is greater than that of the OES regional data — despite its smaller geography — due to BLS data availability issues. IMPLAN imputes employment based on BLS and PUMS data. A more detailed methodology: https://support.implan.com/hc/en-us/articles/360051197853-Occupation-Data-Details.

A comparison of labor supply and availability data reveals that workers in certain occupations (e.g., civil engineers and administrative assistants) could be readily hired locally, while workers in other occupations—particularly electricians, construction equipment operators, and construction laborers—will likely need to be hired from outside the local area. This is because the labor demand from the solar facility alone, as well as the combined solar facility and BESS, would comprise over 10 percent, and in some cases over 20 percent of available workers in these occupations. With unemployment rates generally low (3 to 5 percent) in the region, project developers would need to attract a significant number of workers away from other work in the region.

Multiple factors influence local worker availability beyond the number of workers in an occupation within a certain geography—though this is an appropriate starting point. Factors including compensation, benefits and perks, licensing requirements, working conditions, competing opportunities, and overall economic conditions all influence workers' decisions to take one job over another (or do something else entirely). Some of these factors the potential employer has influence over (e.g., compensation), while others it has limited to no influence over (e.g., competing opportunities, general economic conditions).

Given a set of assumptions consistent with other project experience in the region, the regional labor market may supply just over half of the workforce, with just under half coming from outside the region. Combining the solar facility with the BESS increases the overall labor demand and non-local share slightly.

Table ES-3. Estimated Local and Non-Local Workers

Source: ECONorthwest analysis

		Estimated Peak	Percent Local	Total Local	Percent Non-Local	Total Non-Local
PV Solar Generation Occupations						
47-2111	Electricians	143	50%	72	50%	72
47-2070	Construction Equipment Operators	147	50%	73	50%	73
47-2061	Construction Laborers	303	50%	151	50%	151
17-1022	Surveyors	5	50%	3	50%	3
47-1011	Craft Supervision	19	100%	19	0%	0
11-9021	Construction Management	12	100%	12	0%	0
43-1000	Administrative Assistant	5	100%	5	0%	0
49-9051	Power Line Installers	15	75%	11	25%	4
17-2051	Civil Engineers	3	100%	3	0%	0
47-2051	Concrete Finishers	9	100%	9	0%	0
47-4011	Construction Inspector/Engineers	8	100%	8	0%	0
29-9011	Health and Safety Specialists	7	0%	0	100%	7
	Total Solar Generation Occupations	**676**	**54%**	**367**	**46%**	**309**
BESS Occupations						
47-2061	Construction Laborer	75	100%	75	0%	0
47-2111	Electricians	79	75%	59	25%	20
47-2070	Equipment Operators etc.	38	75%	29	25%	10
53-3032	Truck Drivers	4	100%	4	0%	0
a11-9021	Project Managers / Support	70	50%	35	50%	35
47-2000	Other Construction	14	100%	14	0%	0
	Total BESS Occupations	**280**	**77%**	**216**	**23%**	**64**
Total PV Solar Generation + BESS						
47-2111	Electricians	222	50%	111	50%	111
47-2070	Construction Equipment Operators	185	50%	93	50%	93
47-2061	Construction Laborers	378	50%	189	50%	189
17-1022	Surveyors	5	50%	3	50%	3
47-1011	Craft Supervision	19	100%	19	0%	0
11-9021	Construction Management	83	50%	41	50%	41
43-1000	Administrative Assistant	5	100%	5	0%	0
49-9051	Power Line Installers	15	75%	11	25%	4
17-2051	Civil Engineers	3	100%	3	0%	0
47-2051	Concrete Finishers	9	100%	9	0%	0
47-4011	Construction Inspector/Engineers	8	75%	6	25%	2
29-9011	Health and Safety Specialists	7	0%	0	100%	7
53-3032	Truck Drivers	4	100%	4	0%	0
47-2000	Other Construction	14	100%	14	0%	0
	Total PV Solar Generation + BESS	**956**	**53%**	**507**	**47%**	**449**

Note: Totals may not sum due to rounding. The percent of non-local workers at peak for the PV Solar Generation and combined scenarios are different than for BESS because a smaller number of workers in high-demand occupations would be needed, resulting in a higher proportion likely coming from the local labor market.

For preliminary analysis purposes only. Estimates may change as project plans evolve.

Housing Availability Analysis

Construction and operation of the proposed project will attract a non-local workforce with potentially diverse housing requirements and preferences. Project workers may seek temporary housing in the region in the form of rental housing, hotel/motels, and RV parks.

The analysis of rental and transient lodging supply shows that the region can likely supply 1,458 units of rental housing and 1,621 units of transient lodging, for a total of 3079 units of total housing (Table ES-4). This is well above the high estimate of housing unit demand, 950 units (Table ES-5). Thus, it is likely that within the region, the housing market could comfortably be able to accommodate the anticipated influx of non-local construction workers under both the 100-percent or reduced non-local workforce assumptions for the solar-only and combined scenarios.

ES-4 Summary of Housing Supply

Source: ECONorthwest analysis of sources described above

Location	Total Vacant Units Rental Housing	Total Vacant Units Transient Lodging[1]	Total Vacant Housing Units
Morrow County, OR	77	83	160
Umatilla County, OR	638	454	1,092
Gilliam County, OR	24	24	48
Benton County, WA	631	813	1,444
Franklin County, WA	88	247	335
Total	**1,458**	**1,621**	**3,079**

Notes: 1/Transient lodging includes hotels, motels, and RV parks

ES-5 Summary of Housing Demand

Source: ECONorthwest analysis of sources described above

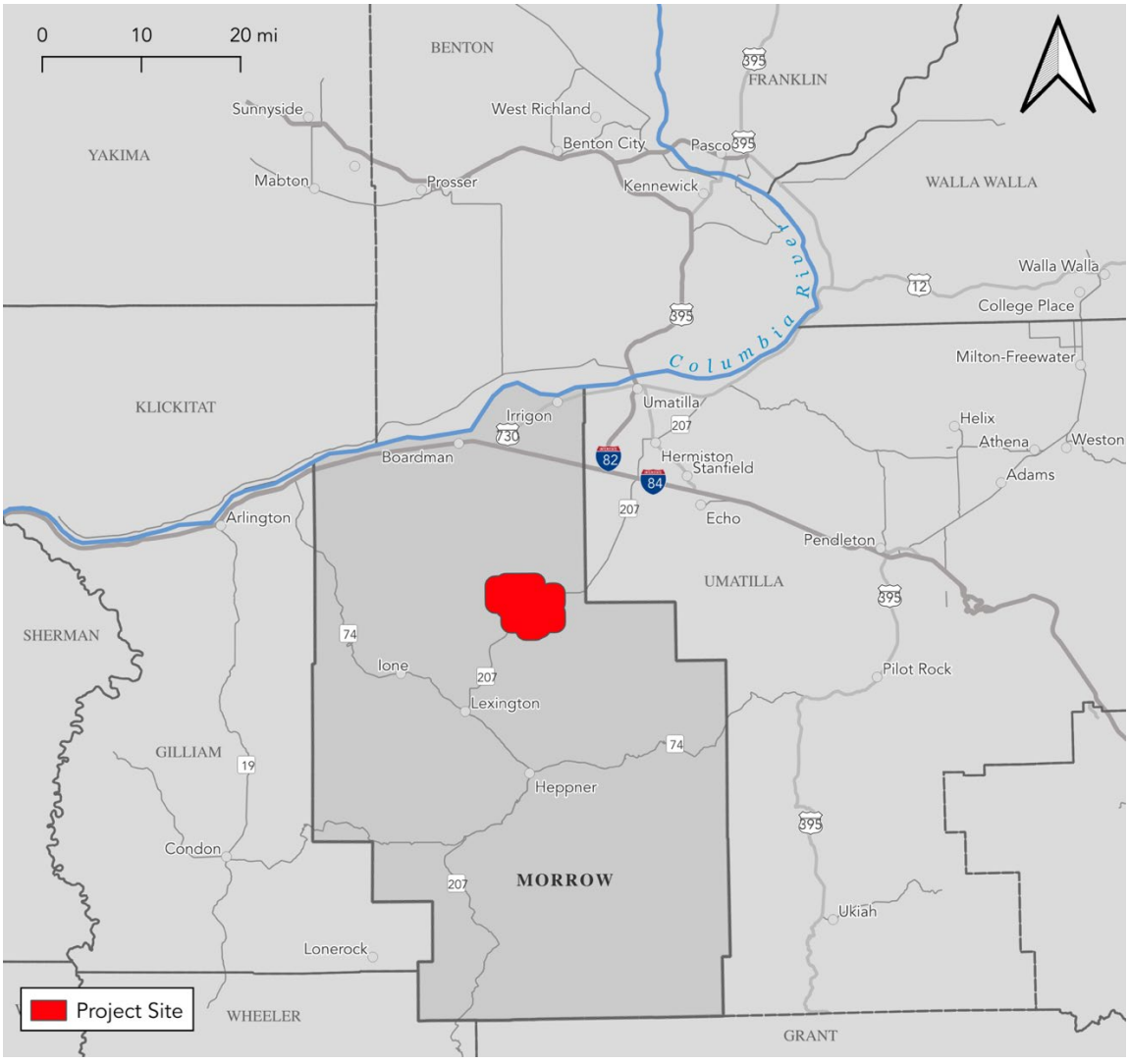
	Single Occupancy Unit Demand (Peak Construction)		Double Occupancy Unit Demand (Peak Construction)	
Scenario	100-Percent Non-Local	Workforce Analysis Non-Local	100-Percent Non-Local	Workforce Analysis Non-Local
PV Solar Generation	670	335	310	155
PV Solar Generation + BESS	950	450	475	225

The regional supply of housing can accommodate project-related demand with workers commuting between 30 and 60 minutes primarily to Benton and Umatilla Counties. The housing supply in Morrow County alone will not accommodate all workers at peak construction in any scenario *except* under the solar facility alone assuming double occupancy. In this scenario worker demand for housing at double-occupancy is approximately equal to vacant housing supply in Morrow County: at most, Morrow County will be able to absorb about 150 workers, assuming double-occupancy in transient lodging. An additional 150 workers could potentially be housed in apartments and rental houses at double occupancy. However, this would consume all available lodging and displace demand generated through natural population growth and other economic development activity likely to occur through 2030.

1. Introduction and Background

Sunstone Solar, LLC (Sunstone Solar), a subsidiary of Pine Gate Renewables, LLC (PGR), is proposing to construct and operate the Sunstone Solar Project (Project or Facility), an up to 1,200 megawatt (MW) alternating current (AC) photovoltaic (PV) solar energy generation facility in Morrow County, Oregon (Figure 1). The Project also includes a distributed battery energy storage system (BESS), two interconnection switchyards, six collector substations, up to four operations and maintenance (O&M) buildings, and other structures including overhead transmission lines, roads, perimeter fencing, and gates. PGR is presently seeking to permit a range of PV and related or associated technology within the Project site boundary to allow for micrositing flexibility. For the purposes of analysis, PGR has developed a representative development scenario that assumes the Project would be built in six overlapping phases of 200 MW each, with construction anticipated to start in April 2026.

Figure 1. Project Location
Source: ECONorthwest



This report is prepared on behalf of PGR to assesses the workforce availability and housing availability and impacts of the Project.

- The objective of the **workforce availability analysis** (Section 2 of this report) is to provide information to PGR about regional labor market conditions and the potential to hire local labor to construct the Project. The worker availability analysis also provides information about the project workforce that supports assumptions used in the housing availability and impact analysis and the economic impact analysis (*see Sunstone Solar Project: Economic and Agricultural Impact Analysis)*. The analysis assesses workforce availability in the context of a regional labor market, which encompasses counties in both Oregon and Washington.
- The **housing availability and impact analysis** (Section 3 of this report) compares the supply of housing by type with potential demand generated from project employment, describes potential capacity constraints and local impacts, and offers potential mitigation options commonly used on other similar projects. The analysis assesses housing availability for Morrow County and the surrounding counties in Oregon and Washington that are included in the regional labor market.

Project Overview

Project construction is expected to occur in a series of phases. Options for construction phasing for the Facility include six sequential and/or overlapping phases, or fewer phases based on concurrent construction of multiple blocks. For this analysis, PGR assumes that the Project will be constructed in six overlapping phases of approximately 200 MW each, with each construction phase lasting 21 months. The construction period for all six phases would span from 2026 to 2030. Two primary interconnection switchyards will be built at the points of interconnection, either sequentially or concurrently. Each 200 MW phase will have an associated collector substation that will be constructed as part of that phase. The distributed BESS is evaluated separately but could be installed concurrently with each 200 MW phase of solar arrays. Power will be transported from the supporting substations to the primary interconnection switchyards via 230-kV overhead transmission lines.

Regional Demographic and Economic Overview

Population

Located in north-central Oregon, Morrow County is bordered to the north by the Columbia River and the State of Washington. The county is approximately 2,031 square miles in size and most of its area (about 87 percent) is agricultural land (U.S. Census Bureau 2023, U.S. Department of Agriculture [USDA] 2017). Morrow County had a total estimated population of 12,315 in 2022, ranking 29 out of the 36 counties in Oregon in terms of population (Portland State University 2023). The county is sparsely populated with a population density of 6.1 people per square mile—well below the corresponding state and national averages, which were 44.2

and 94.3 people per square mile, respectively (U.S. Census Bureau 2023). There are five incorporated communities in Morrow County (Boardman, Heppner, Ione, Irrigon, and Lexington), which together account for almost two-thirds (65 percent) of the population (Table 2). The overall county population has increased over the past decade, with most of the growth occurring in Boardman and Irrigon in the north part of the county. The communities in the central part of the county saw more modest increases or lost population over the same period (Table 2).

Morrow County is centered in a larger regional population and economy centered around the Tri-Cities Metropolitan Statistical Area (MSA) (also known as the Kennewick-Richland, WA MSA). The Tri-Cities MSA is comprised of the cities of Kennewick, Pasco, and Richland in Benton and Franklin Counties, just across the Columbia River in Washington. This area has experienced robust population and economic growth over the last ten years, generally outpacing statewide growth rates in Oregon and Washington. Boardman, the largest city in Morrow County, has experienced similar levels of population and employment growth as the Tri-Cities MSA (Washington State Employment Security Department 2022).

Table 1. Regional Population
Source: Portland State University 2023, U.S. Census Bureau 2021

Geographic Area	2022		Change 2010 to 2022	
	Estimated Population	Percent of Total	Net Change	Percent Change
Morrow County, OR	**12,315**	**100%**	**1,142**	**10.2%**
Boardman	*4,116*	*33%*	*896*	*27.8%*
Heppner	*1,182*	*10%*	*-109*	*-8.4%*
Ione	*343*	*3%*	*14*	*4.3%*
Irrigon	*2,067*	*17%*	*241*	*13.2%*
Lexington	*238*	*2%*	*0*	*0.0%*
Unincorporated	*4,369*	*35%*	*100*	*2.3%*
Umatilla County, OR	80,401	100%	4,512	6%
Gilliam County, OR	2,071	100%	200	11%
Benton County, WA[1]	210,025	100%	34,848	20%
Franklin County, WA[1]	98,268	100%	20,105	26%
Oregon Statewide	**4,281,851**	**100%**	**450,777**	**12%**
Washington Statewide	**7,738,692**	**100%**	**1,014,152**	**15%**

Notes:
[1/] Washington's Population in 2022 is drawn from Census Bureau estimates of 2021 population.

Economy

The local economy in Morrow County has traditionally been dominated by agriculture, which accounts for about 17 percent of local jobs compared to 3 percent statewide. Manufacturing is the single largest sector in terms of employment, accounting for 21 percent of local jobs compared to 8 percent statewide (Table 3). Most employment in manufacturing in Morrow County is food manufacturing, which employed 1,700 people in 2021 (Fridley 2022). Food manufacturers include Columbia River Processing and Lamb Weston. A more detailed discussion of Morrow County's economy including a detailed presentation of employment by

industry and overview of local employers is included in the *Sunstone Solar Project: Economic and Agricultural Impact Analysis*.

Compared to Morrow County, the Tri-Cities MSA (Franklin and Benton Counties in Washington) has a higher concentration of employment in construction, retail trade, administrative services, and health care and social assistance.

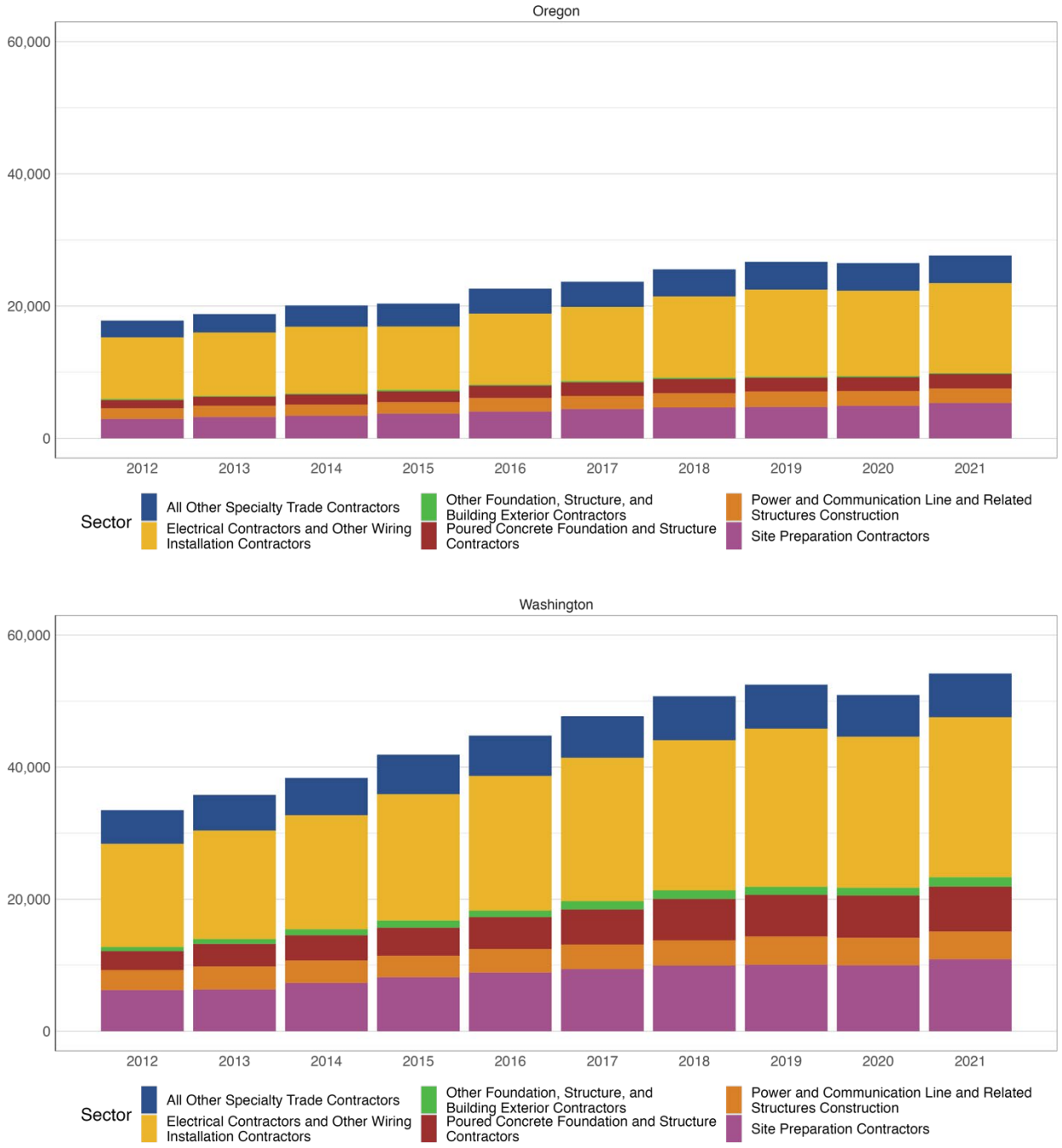
Table 2. Employment by Economic Sector, 2021
Source: U.S. Bureau of Economic Analysis 2022

Economic Sector[1/]	Morrow County		Tri-Cities MSA[3/]	
	Employment	Percent of Total	Employment	Percent of Total
Agriculture	1,399	17%	8,957	6%
Utilities	104	1%	(D)	N/A
Construction	136	2%	12,945	8%
Manufacturing	1,801	21%	8,598	5%
Wholesale trade	138	2%	3,820	2%
Retail trade	370	4%	17,262	11%
Transportation and warehousing	199	2%	(D)	N/A
Finance and insurance	79	1%	5,137	3%
Real estate	179	2%	5,746	4%
Administrative and waste services	302	4%	13,545	8%
Educational services	9	0%	1,694	1%
Health care and social assistance	334	4%	19,424	12%
Other services	219	3%	7,304	5%
Government	1,043	12%	19,535	12%
Other sectors[2/]	2,103	25%	36,992	23%
Total employment	**8,415**	**100%**	**160,959**	**100%**

Notes:
(D)–Withheld to avoid disclosing individual data
N/A–Not applicable
1/ Employment estimates include self-employed individuals. Employment data are by place of work, not place of residence, and, therefore, include people who work in the area but do not live there. Employment is measured as the average annual number of jobs, both full- and part-time, with each job counted at full weight.
2/ The other sectors category consists of seven sectors where data are not shown for Morrow County to avoid disclosure of confidential information: forestry, fishing, and related activities; mining, quarrying, and oil and gas extraction; information; professional, scientific, and technical services; management of companies and enterprises; arts, entertainment, and recreation; and accommodation and food services. In Tri-Cities MSA, the other sectors category includes utilizes and transportation and warehousing, in addition to the seven categories included for Morrow County.
3/ Tri-Cities MSA consists of Franklin and Benton Counties in Washington.

In Oregon and Washington, construction employment increased at an average rate of 5 percent per year between 2012 to 2021. Employment in the "Power and Communication Line and Related Structures Construction" and "Electrical Contractors and Other Wiring Installation Contractors" industries have increased at an average rate of 4 to 5 percent per year in Oregon and Washington. Figure 2 presents the employment level by detailed construction industry between 2012-2022.

Figure 2. Employees by Construction Subsector, Oregon and Washington, 2012–2022
Source: U.S. Bureau of Labor Statistics. (2012-2023). Quarterly Census of Employment and Wages.



Construction industry employment is highly concentrated in Benton and Franklin counties compared to the national average, as shown by the Location Quotients presented in Table 4. A Location Quotient of 1.00 indicates that employment in that industry as share of total employment is at the national average for an area (controlling for labor force size). Benton County's construction industry employment is 51 percent more concentrated than the national average and Franklin County's employment is 42 percent more concentrated the national

average. Morrow, Umatilla, and Walla Walla counties fall short of the national average, indicating that construction employment makes up a smaller share of total employment than the national average.

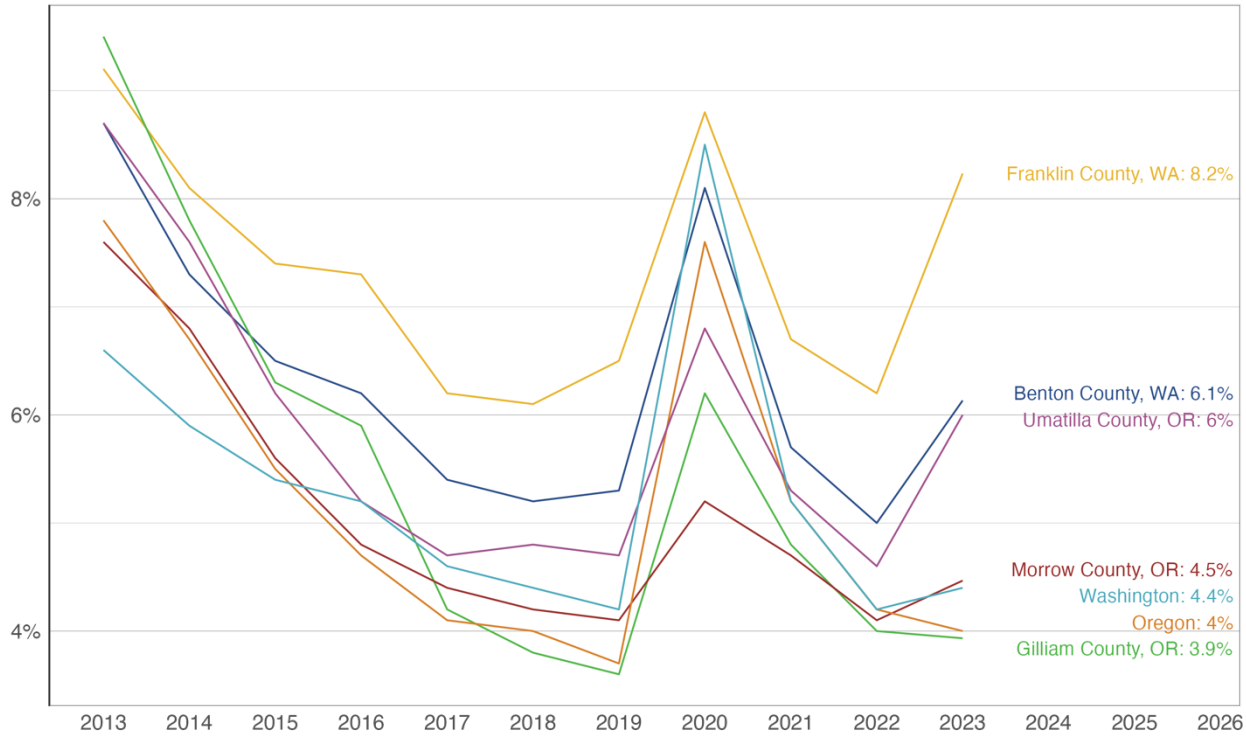
Table 3. Construction (NAICS 23) Industry Employment in Labor Market Area
Source: U.S. Bureau of Labor Statistics, Q3 2022, Quarterly Census of Employment and Wages

County	Employment Level	Employment Location Quotient
Morrow	177	0.53
Umatilla	1,248	0.73
Gilliam	ND	ND
Benton	7,760	1.51
Franklin	2,885	1.42
Total (Average)	**12,070**	**(1.05)**

Recent Expected Economic Trends

In recent years, economic growth has been robust in the region centered around the Tri-Cities MSA and Boardman in Morrow County. While not unscathed by the economic recession following the COVID-19 pandemic, the economic disruption was generally more tempered, with lower peak unemployment and a faster economic recovery than surrounding areas. Unemployment rates remain relatively low in Morrow County, at 4.5 percent.

Figure 3. Regional Annual Unemployment Rates
Source: U.S. Bureau of Labor Statistics. (2012-2023). Local Area Unemployment Statistics



Notes: 2023 unemployment rate represents the average of January through March 2023. Unemployment rates typically

drop during the summer months, which is why 2023 rates look like they are trending upward relative to the annual rates for previous years.

By 2030, employment in Eastern Oregon is expected to grow at approximately 2 percent per year. The leisure and hospitality sector is anticipated to grow at the fastest rate, with government, education, and utilities sectors growing the most (Oregon Employment Department 2022). Across the river in Benton County, employment is expected to grow approximately one percent per year overall through 2029. The construction industry in Benton County has expanded by almost 10 percent per year over the last five years and is expected to continue growing to meet demand from other sectors (Washington State Employment Security Department 2022).

Results from the 2022 Job Vacancy Survey for Eastern Oregon indicate that job vacancies were higher in 2022 than they have been since 2015. The region had roughly 4,400 job vacancies at any given time in the year, with the greatest number of vacancies in the private health care and social assistance industry. Survey results identified 160 vacancies in construction and 248 vacancies in the installation, maintenance, and repair occupation group (Oregon Employment Department 2023). Employers reported difficulty filling approximately seven out of ten openings which is reflected in the region's high job vacancy rate. This is likely due to a combination of fast post-pandemic job recovery, relatively low unemployment, and high competition. These trends indicate pressure to import labor into the region.

2. Workforce Availability Analysis

The Project is the largest solar energy generation facility proposed or developed in Eastern Oregon. Other solar energy facilities have recently been developed in Morrow and Gilliam Counties, including the Pachwáywit Fields (Montague Solar Facility) facility in Gilliam County, which began operation in April 2023, and the Wheatridge Renewable Energy Facility (combined wind and solar project) near Heppner in Morrow County, which began operation in 2020. These solar facilities are similar in scale or smaller than a single proposed phase of the Project. Energy development firms have successfully built these projects using labor from the local workforce and drawing labor from elsewhere depending on skill requirements and contractor locations (personal communication with D. Fridley). The difference in scale of this project compared to other recent solar energy development projects has led to questions about workforce availability (and housing availability, discussed in the next section).

This analysis provides information to consider how employment during the four-year construction period (spread across 2026 to 2030) may interact with the local labor market and where employees may come from. The analysis explores data relevant to answering these questions:

- *How much labor in different occupational categories is the Project likely to demand?*
- *What is the supply of local labor (and how would local labor be defined) and how does it compare to Project demand?*
- *How much of the labor by occupation is likely to come from within and outside the region?*

This analysis draws from data current as of 2021/22. We have attempted to ground-truth the trends revealed in the data with regional experts and information available in the literature.[1] That said, the national, state, and local economy continues to be in a period of rapid transformation and uncertainty following the COVID-19 pandemic recession and recovery. Future economic and labor market conditions may differ from current or expected conditions presented in this analysis.

Project Labor Demand

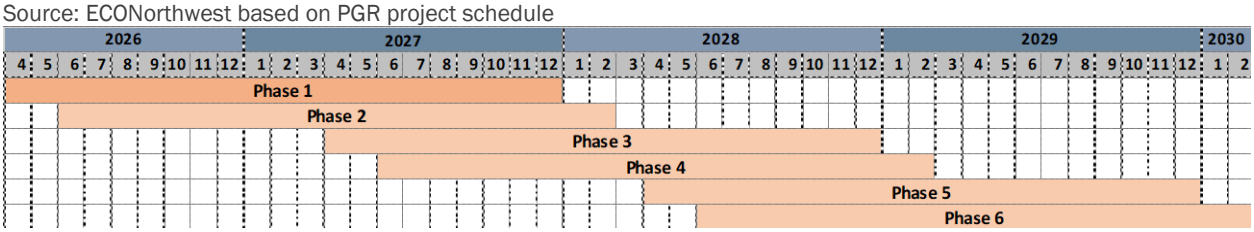
ECONorthwest staff worked with PGR to translate preliminary project development plans into categories of required labor by occupation and quantities of labor by occupation over time. As noted in the project description in the introduction, PGR anticipates constructing the Project in six phases over a four-year period spanning five years. Each phase can be conceptualized as a single project with each phase requiring the same arrangement and quantity of labor. The phases are staggered and overlapping rather than being sequential, so total project labor

[1] Interview with Dallas Fridley, Regional Economist for the State of Oregon Employment Department covering Gilliam, Hood River, Morrow, Sherman, Umatilla, Wasco, and Wheeler counties, May 17, 2023.

demand at a single point in time is higher than labor demand for a single phase. Figure 4 shows this phased timing. For this analysis, labor demand estimates are developed separately for the PV solar energy generation facility and the BESS, with combined totals provided to illustrate peak workforce if both components of the project are developed simultaneously.

Figure 4. Phased Project Timing, 2026–2030

Source: ECONorthwest based on PGR project schedule



The construction of a PV solar energy generation facility relies on a mix of skilled and unskilled labor (Bureau of Labor Statistics ND). Much of the construction and installation of a PV solar facility is completed by general construction workers. However, civil engineers, electricians, and specialty construction equipment operators must be employed to handle the more complex tasks in the construction process. Additionally, surveyors, health and safety specialists, and construction managers are employed to ensure the quality of construction and installation. Each of these occupations are required in certain quantities at certain times during the construction timeline, which typically follows a bell-shaped curve with labor peaking near the middle of the construction period. As specific tasks on one phase complete, the same workers may shift to the next phase of the project. The same workers may also shift across project tasks within a phase, for instance construction laborers may move from excavation to pile driving to concrete pouring as each task needs to be done.

Table 5 shows the composition of labor for the PV solar facility and BESS by occupation for Phase 1 of project construction, and the distribution over the 21-month single phase construction period. Phases 2 through 6 have the same labor composition, except for Power Line Installers which are only part of Phase 1 and are thus excluded from Phases 2 through 6. ***These are preliminary estimates based on planning level information available in May 2023 and may change as plans evolve. The following estimates should not be interpreted as a guarantee of employment in total or for any individual occupation.***

Table 4. Labor Distribution by Month for a Single Phase (Phase 1), 21-month Duration

Source: PGR and ECONorthwest estimates

		2026												2027											
PV Solar Generation Occupations		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
47-2111	Electricians				2	2	17	25	32	55	58	66	67	67	67	67	59	59	59	29	20	12	9	9	9
47-2070	Construction Equipment Operators				11	11	17	25	32	55	58	66	67	67	67	67	59	59	59	29	20	12	9	9	9
47-2061	Construction Laborers				32	32	34	49	65	110	116	132	134	134	134	134	119	119	119	58	40	25	18	18	18
17-1022	Surveyors				0	0	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	0	0	0	0
47-1011	Craft Supervision				1	1	2	3	4	7	7	8	9	9	9	9	8	8	8	4	3	2	1	1	1
11-9021	Construction Management				1	1	1	2	3	5	5	5	6	6	6	6	5	5	5	2	2	1	1	1	1
43-1000	Administrative Assistant				0	0	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	0	0	0	0
49-9051	Power Line Installers				15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	0	0	0
17-2051	Civil Engineers				0	0	0	1	1	1	1	2	2	2	2	2	1	1	1	1	0	0	0	0	0
47-2051	Concrete Finishers				1	1	1	2	2	4	4	4	4	4	4	4	4	4	4	2	1	1	1	1	1
47-4011	Construction Inspector/Engineers				1	1	1	1	2	3	3	4	4	4	4	4	3	3	3	2	1	1	0	0	0
29-9011	Health and Safety Specialists				1	1	1	1	1	3	3	3	3	3	3	3	3	3	3	1	1	1	0	0	0
	PV Solar Generation Total Labor				**65**	**65**	**90**	**125**	**160**	**260**	**275**	**310**	**315**	**315**	**315**	**315**	**280**	**280**	**280**	**145**	**105**	**70**	**40**	**40**	**40**
BESS Occupations																									
47-2061	Construction Laborer				0	0	0	0	38	38	38	38	38	38	38	38	38	38	38	38	0	0	0	0	0
47-2111	Electricians				0	0	0	0	39	39	39	39	39	39	39	39	39	39	39	39	0	0	0	0	0
47-2070	Equipment Operators etc.				0	0	0	0	19	19	19	19	19	19	19	19	19	19	19	19	0	0	0	0	0
53-3032	Truck Drivers				0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0
a11-9021	Project Managers / Support				0	0	0	0	35	35	35	35	35	35	35	35	35	35	35	35	0	0	0	0	0
47-2000	Other Construction				0	0	0	0	7	7	7	7	7	7	7	7	7	7	7	7	0	0	0	0	0
	BESS Total Labor				**0**	**0**	**0**	**0**	**140**	**140**	**140**	**140**	**140**	**140**	**140**	**140**	**140**	**140**	**140**	**140**	**0**	**0**	**0**	**0**	**0**
Total PV Solar Generation + BESS Labor					***65***	***65***	***90***	***125***	***300***	***400***	***415***	***450***	***455***	***455***	***455***	***455***	***420***	***420***	***420***	***285***	***105***	***70***	***40***	***40***	***40***

Note: For preliminary analysis purposes only. Estimates may change as project plans evolve.

Table 6 shows the estimated workforce demand by occupation for the Project, in three ways. Project Total (FTE[2]) represents the total worker-years of employment the project will generate. Some workers will be the same from year to year, others may be present for only part of a year, so this does not represent total *employees*. Project Average represents the average number of workers needed across the six phases. The peak workers in an occupation represent the highest total workers needed at the same time across project phases. Comparing the average to the peak labor demand shows that some labor categories are required in high amounts for a short period of time while some labor categories provide sustained employment at consistent levels throughout the project.

Table 6 indicates that the project will require the most workers in the construction laborer category, nearly 50 percent of the total workforce. Electricians and construction equipment operators make up the other large labor categories at about 22 percent each of the total project workforce. This assumes licensed electricians are not required to handle certain installation tasks. If this requirement changes, the proportion of electricians could increase, replacing many of the construction laborers (personal communication with PGR staff).

Table 5. Project Labor Demand Across Project (Phases 1 through 6)
Source: PGR and ECONorthwest Estimates

		Project Total (FTE)	Project Average	Project Peak
PV Solar Generation Occupations				
47-2111	Electricians	396	79	143
47-2070	Construction Equipment Operators	405	81	147
47-2061	Construction Laborers	820	164	302
17-1022	Surveyors	15	3	5
47-1011	Craft Supervision	52	10	19
11-9021	Construction Management	34	7	12
43-1000	Administrative Assistant	12	2	5
49-9051	Power Line Installers	23	5	15
17-2051	Civil Engineers	9	2	3
47-2051	Concrete Finishers	26	5	9
47-4011	Construction Inspector/Engineers	22	4	8
29-9011	Health and Safety Specialists	19	4	7
	PV Solar Generation Total	**1,833**	**367**	**670**
BESS Occupations				
47-2061	Construction Laborer	225	75	45
47-2111	Electricians	236	79	47
47-2070	Equipment Operators etc.	115	38	23
53-3032	Truck Drivers	11	4	2

[2] Each FTE job equates to one full-time job for one year or 2,080-hour units of labor. Part-time or temporary jobs constitute a fraction of a job. For example, if an engineer works just 3 months on a solar project, that would be considered one-quarter of an FTE job.

a11-9021	Project Managers / Support	211	70	42
47-2000	Other Construction	42	14	8
	BESS Total	**840**	**168**	**280**
Total PV Solar Generation + BESS		***2,673***	***535***	***950***

Note: For preliminary analysis purposes only. Estimates may change as project plans evolve.

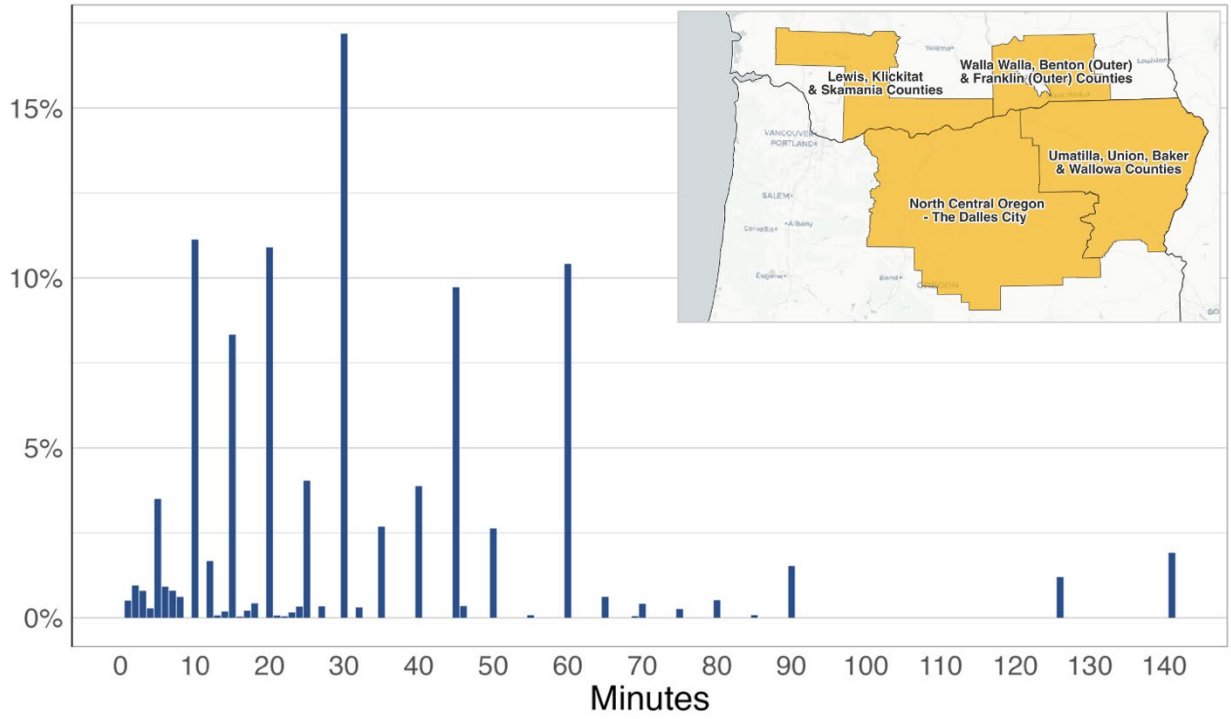
Local Labor Supply

Workers in the rural and more sparsely populated regions of Oregon and Washington routinely commute further distances to their jobs than workers in urban centers. Similarly, construction workers (regardless of where they live) also routinely commute relatively longer distances to work than workers in most other occupations. Thus, the relevant labor market for quantifying potential local labor supply for the Project is larger than Morrow County and the cities and towns immediately surrounding the Project site.

To understand how large the labor market is in this region, we evaluated data on commuting patterns. To estimate the willingness to travel for workers who live in the surrounding region, we computed the average drive time to work for the types of workers the Project would demand the most: construction laborers, electricians, and construction equipment operators. Figure 5 presents the distribution of commuting times to work for the selected occupations across a broad geography surrounding Morrow County, largely excluding urban areas. About 46 percent of workers in these occupations commute for 30 minutes or longer, with construction laborers and equipment operators generally commuting for longer times than electricians. Approximately 20 percent of workers commute 25 to 35 minutes to their job site, another 10 percent commute 60 minutes, and 4 percent commute for 2 hours (U.S. Census Bureau 2021).

Figure 5. Commuting Time to Work, Select Construction Occupations

Source: U.S. Census Bureau. (2021). American Community Survey (ACS) One-Year Public Use Microdata Sample (PUMS).

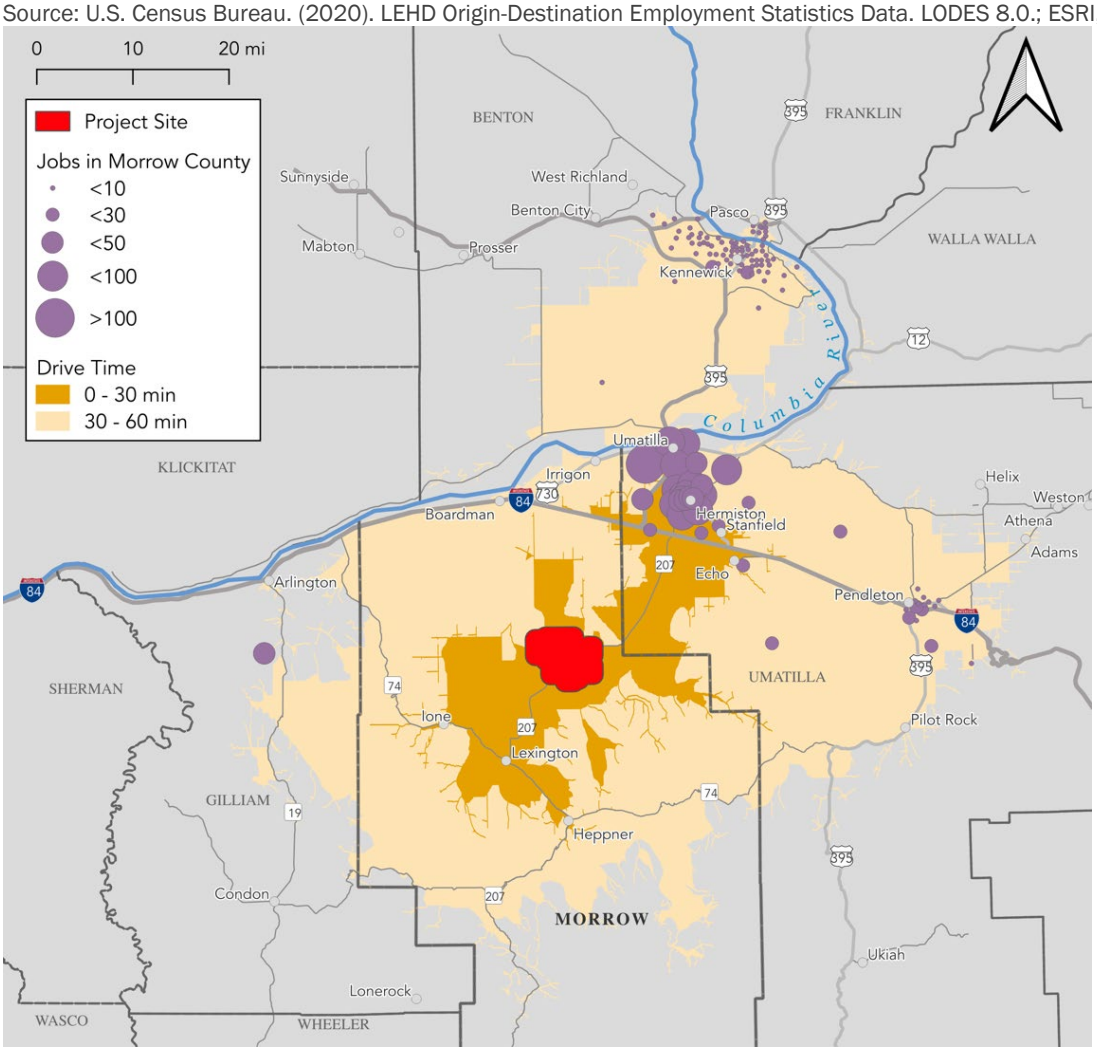


Notes: Figure includes commuting by car, truck, and van. Figure includes commuters from the following occupations: construction laborers, construction equipment operators, and electricians. Figure captures commuting patterns from workers in the area highlighted in inset map: Lewis, Klickitat, Skamania, Walla Walla, Benton (outer), Franklin (outer) Counties, Washington; North Central Oregon - The Dalles City; and Umatilla, Union, Baker, and Wallowa Counties, Oregon.

These data suggest that defining a labor market geography with maximum drive times of 60 minutes to the project site is not unreasonable in this region for the types of workers that the Project would employ. This distance encompasses Gilliam, Morrow, and Umatilla counties in Oregon and Benton and Franklin counties in Washington, shown in Figure 6. Figure 6 shows how many people already work in Morrow County but live in a different county. Many workers who commute to Morrow County live in the Umatilla and Hermiston area, which is 30 to 60 minutes away, and the Tri-Cities area, which is 60 minutes away.

Figure 6. Relevant Labor Market Geography

Source: U.S. Census Bureau. (2020). LEHD Origin-Destination Employment Statistics Data. LODES 8.0.; ESRI, 2023



Note: Each circle represents one block group.

Within the labor market geography defined in Figure 6, we use data from the Bureau of Labor Statistics (BLS) Occupational, Employment, and Wage Statistics (OEWS) Survey to estimate the number of total workers in each occupational category the Project would need workers from. Because of limitations in the way BLS reports these data, we draw them from two sources. The first, shown in Table 7, is directly from BLS, which reports occupational employment at the MSA level for the Tri-Cities MSA (Benton and Franklin Counties) and for the Eastern Oregon nonmetropolitan area, which includes Morrow and seven other Eastern Oregon counties, an area much larger than our labor market region (BLS 2022).[3] This has the potential to overestimate available labor.

[3] Baker County, Grant County, Harney County, Malheur County, Morrow County, Umatilla County, Union County, Wallowa County. Walla Walla County, Washington is included in the Walla Walla MSA, which also includes Columbia County. To avoid further overestimating labor availability we exclude it.

Table 6. Regional Employment by Occupation
Source: Bureau of Labor Statistics, OEWS, May 2022

SOC Code[1]	Occupation Description	Eastern Oregon NMA	Tri-Cities MSA	Total
47-2111	Electricians	290	880	1,170
47-2070	Construction Equipment Operators	230	410	640
47-2061	Construction Laborers	630	1,480	2,110
17-1022	Surveyors	-	40	40
47-1011	Craft Supervision	260	1,060	1,320
11-9021	Construction Management	170	270	440
43-1000	Administrative Assistant	480	990	1,470
49-9051	Power Line Installers	100	130	230
17-2051	Civil Engineers	80	610	690
47-2051	Concrete Finishers	60	260	320
47-4011	Construction Inspector/Engineers	70	100	170
29-9011	Health and Safety Specialists	-	-	-
53-3032	Truck Drivers	1,190	1,950	3,140
47-2000	Other Construction	310	1,160	1,470
Total		**3,870**	**9,340**	**13,210**

Notes:
1/ SOC stands for Standard Occupational Classification

We supplement these BLS data with occupational employment from IMPLAN Group, which provides estimates at the county level and better aligns with the labor market geography.[4] Table 8 presents the occupation employment estimates for the labor market geography. The total in Table 8 is slightly larger than the total in Table 7 for the BLS region, which is likely a function of the methodology IMPLAN uses to interpolate the BLS data at the county level. The benefit of these data is that they provide an estimate of labor availability in Morrow County specifically. This perspective confirms that the estimated number of employees likely to come from within Morrow County is very small. It also illustrates the substantial potential labor pool of construction laborers in Benton County, within the 60-minute drive time area.

[4] IMPLAN computes county occupational employment from BLS OEWS and Census Bureau American Community Survey (ACS) Public Use Microdata Sample (PUMS). See more information on its methodology here: https://support.implan.com/hc/en-us/articles/360051197853-Occupation-Data-Details

Table 7. County Employment by Occupation

Source: IMPLAN, Occupation Detail, 2021

SOC Code	Occupation Description	Oregon			Washington		Total Region
		Morrow	Gilliam	Umatilla	Benton	Franklin	
47-2111	Electricians	16	5	140	620	231	1,012
47-2070	Construction Equipment Operators	13	8	105	506	154	786
47-2061	Construction Laborers	16	12	191	1,064	353	1,636
17-1022	Surveyors	0	0	4	61	7	72
47-1011	Craft Supervision	13	11	138	763	239	1,164
11-9021	Construction Managers	5	3	54	300	99	461
43-1000	Administrative Assistant	46	9	272	870	281	1,478
49-9051	Power Line Installers	12	1	44	213	67	337
17-2051	Civil Engineers	4	2	47	341	62	456
47-2051	Concrete Finishers	3	2	35	189	71	300
47-4011	Construction Inspector/Engineers	3	1	24	93	21	142
29-9011	Health and Safety Specialists	-	-	-	-	-	-
53-3032	Truck Drivers	116	43	761	1,667	913	3,500
47-2000	Other Construction	10	6	139	672	248	1,075
Total		**258**	**103**	**1,952**	**7,359**	**2,747**	**12,419**

Note: the total employment for these occupations in the labor shed is greater than that of the OES regional data — despite its smaller geography — due to BLS data availability issues. IMPLAN imputes employment based on BLS and PUMS data. See footnote 6.

Analysis of Workforce Availability

The data presented in the previous sections provide information about how much labor the project will require during the construction period, and how much labor is generally available within a reasonable commuting time to the project site. A simple comparison of the data, shown in Table 9, illustrates that workers in some occupations (e.g., civil engineers and administrative assistants) could be readily hired locally because only a few are needed, and the labor pool is comparatively large. For other occupations, particularly electricians, construction equipment operators, and construction laborers, it is likely that a substantial portion of these workers will come from outside the local area. Although there are more workers available in every occupation in the region than the project will employ (i.e., no occupation exceeds 100 percent of region employment), it is unlikely this project will draw as many as are required away from other job opportunities.

Specifically, Table 9 is divided into the PV Solar Generation and BESS Project components and shows a combined total at the bottom assuming they happen simultaneously within each phase. In each of these categories it shows the estimated number of workers construction activities will employ at the "peak demand" for each occupation when the most workers will be needed simultaneously as multiple phases overlap (based on planning-level information available in March 2023, subject to change). It then shows this peak as a percent of the total labor supply as represented by both the BLS data and the IMPLAN data, as discussed in the previous section, and the average of the two. The shading in the table highlights where the percent of project labor demand exceeds certain thresholds. The dark orange shows project demand exceeding 10 percent of available labor. Light orange shows values between an unemployment rate of 5 percent—which represents the current unemployment rate for Benton County where more than

half of the regional workforce (53 percent, as shown in Table 8) is centered—and 10 percent. Green indicates project labor demand less than the unemployment rate of 5 percent.

Table 8. Project Labor Demand as Percentage of Labor Market Supply

Source: PGR and ECONorthwest Estimates; Bureau of Labor Statistics, OEWS, 2022; IMPLAN, Occupation Detail, 2021

		Estimated Peak Workers	Percent of BLS Region Employment	Percent of IMPLAN Region Employment	Percent of Average Region Employment
PV Solar Generation Occupations					
47-2111	Electricians	143	12.2%	14.1%	13.2%
47-2070	Construction Equipment Operators	147	22.9%	18.6%	20.8%
47-2061	Construction Laborers	303	14.3%	18.5%	16.4%
17-1022	Surveyors	5	13.3%	7.3%	10.3%
47-1011	Craft Supervision	19	1.4%	1.6%	1.5%
11-9021	Construction Management	12	2.8%	2.6%	2.7%
43-1000	Administrative Assistant	5	0.3%	0.3%	0.3%
49-9051	Power Line Installers	15	6.5%	4.5%	5.5%
17-2051	Civil Engineers	3	0.5%	0.8%	0.6%
47-2051	Concrete Finishers	9	3.0%	3.2%	3.1%
47-4011	Construction Inspector/Engineers	8	4.7%	5.6%	5.2%
29-9011	Health and Safety Specialists	7	ND	ND	ND
BESS Occupations					
47-2061	Construction Laborer	75	3.6%	4.6%	4.1%
47-2111	Electricians	79	6.7%	7.8%	7.2%
47-2070	Equipment Operators etc.	38	6.0%	4.9%	5.4%
53-3032	Truck Drivers	4	0.1%	0.1%	0.1%
a11-9021	Project Managers / Support	70	16.0%	15.3%	15.6%
47-2000	Other Construction	14	1.0%	1.3%	1.1%
Total PV Solar Generation + BESS					
47-2111	Electricians	222	19.0%	21.9%	20.4%
47-2070	Construction Equipment Operators	185	28.9%	23.5%	26.2%
47-2061	Construction Laborers	378	17.9%	23.1%	20.5%
17-1022	Surveyors	5	13.3%	7.3%	10.3%
47-1011	Craft Supervision	19	1.4%	1.6%	1.5%
11-9021	Construction Management	83	18.8%	17.9%	18.4%
43-1000	Administrative Assistant	5	0.3%	0.3%	0.3%
49-9051	Power Line Installers	15	6.5%	4.5%	5.5%
17-2051	Civil Engineers	3	0.5%	0.8%	0.6%
47-2051	Concrete Finishers	9	3.0%	3.2%	3.1%
47-4011	Construction Inspector/Engineers	8	4.7%	5.6%	5.2%
29-9011	Health and Safety Specialists	7	ND	ND	ND
53-3032	Truck Drivers	4	0.1%	0.1%	0.1%
47-2000	Other Construction	14	1.0%	1.3%	1.1%

Note: For preliminary analysis purposes only. Estimates may change as project plans evolve.

Multiple factors influence local worker availability beyond the number of workers in an occupation within a certain geography—though this is an appropriate starting point. Factors including compensation, benefits and perks, licensing requirements, working conditions, competing opportunities, and overall economic conditions all influence workers' decisions to

take one job over another (or do something else entirely). Some of these factors the potential employer has influence over (e.g., compensation), while others it has limited to no influence over (e.g., competing opportunities, general economic conditions).

Another factor influencing local versus non-local shares of workers is where the contractor hired to manage the project is located and their preferences for hiring. On many projects, skilled labor comes with contractors from out of the region or out of state (interview with D. Fridley 2023). Renewable projects have often been criticized for promising local employment but recruiting most workers from out of state. Limited research is available documenting these hiring patterns, but anecdotally solar projects tend to hire greater percentages of local workers compared to wind projects because wind projects tend to require workers with more specialized skills than solar projects (Fabra, Lacuesta, Gutiérrez, and Ramos 2023).

Because we can't characterize most of the factors discussed above, we must make some assumptions to estimate the likely share of local workforce availability.

- For all occupations with average percent below the unemployment rate of 5 percent (cells in green) we assume the Project **will be able to hire sufficient workers locally to fill all positions** throughout the construction period.
- For occupations with project demand above the unemployment rate (5 percent) but below 10 percent of the average regional total (cells in light brown), we assume the Project could have sufficient influence to hire close to 100 percent if managers provide sufficient incentives, given the lower numbers needed in these occupation categories, but **assume 75 percent will be hired locally** to provide a conservative estimate.
- For occupations with project demand above 10 percent of the average regional total (cells in brown), we assume the Project could hire a substantial number from the local region with sufficient incentives, but not 100 percent given the high numbers of workers needed and the tight labor market in construction in this region. In this case, we **assume 50 percent will come from the local area**—an assumption used on other energy development projects in the region as described below.

These local hiring assumptions are consistent if not somewhat below planning level assumptions from other projects, based on our experience conducting analysis of other energy development projects in this region (*see,* for example Tetra Tech 2021). It is also of similar scale to other construction/demolition projects that have operated in the region in the recent past, for example the Umatilla Chemical Agent Disposal Facility, which successfully employed over 800 employees when the project completed weapons destruction in 2011 (Northeast Oregon Now 2013).

Table 10 shows the result of applying these assumptions to the estimated project peak workforce. The share of local versus non-local may shift toward local as the total workers needed fluctuates below this peak. The estimate of non-local workers is used to inform the housing analysis in the following section.

Table 9. Estimated Local and Non-Local Workers

Source: ECONorthwest analysis

		Estimated Peak	Percent Local	Total Local	Percent Non-Local	Total Non-Local
PV Solar Generation Occupations						
47-2111	Electricians	143	50%	72	50%	72
47-2070	Construction Equipment Operators	147	50%	73	50%	73
47-2061	Construction Laborers	303	50%	151	50%	151
17-1022	Surveyors	5	50%	3	50%	3
47-1011	Craft Supervision	19	100%	19	0%	0
11-9021	Construction Management	12	100%	12	0%	0
43-1000	Administrative Assistant	5	100%	5	0%	0
49-9051	Power Line Installers	15	75%	11	25%	4
17-2051	Civil Engineers	3	100%	3	0%	0
47-2051	Concrete Finishers	9	100%	9	0%	0
47-4011	Construction Inspector/Engineers	8	100%	8	0%	0
29-9011	Health and Safety Specialists	7	0%	0	100%	7
	Total Solar Generation Occupations	**676**	**54%**	**367**	**46%**	**309**
BESS Occupations						
47-2061	Construction Laborer	75	100%	75	0%	0
47-2111	Electricians	79	75%	59	25%	20
47-2070	Equipment Operators etc.	38	75%	29	25%	10
53-3032	Truck Drivers	4	100%	4	0%	0
a11-9021	Project Managers / Support	70	50%	35	50%	35
47-2000	Other Construction	14	100%	14	0%	0
	Total BESS Occupations	**280**	**77%**	**216**	**23%**	**64**
Total PV Solar Generation + BESS						
47-2111	Electricians	222	50%	111	50%	111
47-2070	Construction Equipment Operators	185	50%	93	50%	93
47-2061	Construction Laborers	378	50%	189	50%	189
17-1022	Surveyors	5	50%	3	50%	3
47-1011	Craft Supervision	19	100%	19	0%	0
11-9021	Construction Management	83	50%	41	50%	41
43-1000	Administrative Assistant	5	100%	5	0%	0
49-9051	Power Line Installers	15	75%	11	25%	4
17-2051	Civil Engineers	3	100%	3	0%	0
47-2051	Concrete Finishers	9	100%	9	0%	0
47-4011	Construction Inspector/Engineers	8	75%	6	25%	2
29-9011	Health and Safety Specialists	7	0%	0	100%	7
53-3032	Truck Drivers	4	100%	4	0%	0
47-2000	Other Construction	14	100%	14	0%	0
	Total PV Solar Generation + BESS	**956**	**53%**	**507**	**47%**	**449**

Note: Totals may not sum due to rounding. The percent of non-local workers at peak for the PV Solar Generation and combined scenarios are different than for BESS because a smaller number of workers in high-demand occupations would be needed, resulting in a higher proportion likely coming from the local labor market.

For preliminary analysis purposes only. Estimates may change as project plans evolve.

3. Housing Availability Analysis

This section presents information on the supply of housing in an area that corresponds to a reasonable commute distance from the project site. The analysis in Section 2 uses commute data from the U.S. Census Bureau to establish the boundaries of the regional labor market, encompassing travel times up to 60 minutes from the project site. The housing analysis uses this same region definition based on evidence that people will commute to the project site from their residence within this area (see Figure 6).

The non-local workforce will seek housing within this area but may choose housing that either minimizes commute times or is near services, such as restaurants and entertainment. To evaluate housing availability along these variables, we present data on housing supply within 30- and 60-minute commute times and by city and county.

The demand for housing is determined by the proportion of non-local workers the project will employ at the peak of construction. This analysis uses two scenarios to bracket potential demand:

1. Up to 100 percent of the project labor force will come from outside the region and require temporary housing during construction. For the PV Solar Generation facility this would be about 670 people. For the BESS this would be about 280 people. For both project components this would be about 950 people during peak construction.
2. Based on the workforce availability analysis above for the PV Solar Generation portion of the project, about 46 percent of the peak workforce would require housing in the region, or about 310 people. If both the PV Solar Generation and BESS facilities were constructed concurrently as described, about 450 non-local workers would need housing.

Typically, construction employment on a project like this is relatively short-term, and workers drawn to the region for this opportunity are unlikely to relocate permanently to the region or relocate with their families. Thus, few construction workers are likely to purchase housing in the region. The phased nature of this project, however, could create employment opportunities that span months and potentially years for some workers, who would likely demand rental housing over temporary hotel/motels and RV parks. Thus, this analysis focuses on these three housing types: rental housing, hotel/motel lodging, and RV parks.

Finally, the housing analysis compares housing supply by type to housing demand by type of worker to assess potential constraints in housing availability. Based on these findings, we provide several mitigation strategies that could be used to ease housing shortages when and where they may occur.

Housing Supply

Project workers may seek temporary housing in the region in the form of rental housing, hotel/motels, and RV parks. Another type of lodging that often becomes an option when a project like this creates substantial demand in a rural area is rooms rented in owner-occupied homes. However, no data are available to assess supply of this type of lodging, so it is not included in the housing supply inventory. It is discussed in more detail in the Housing Impact Analysis at the end of this Section.

Rental Housing

Construction and operation of the proposed project will attract a non-local workforce with potentially diverse housing requirements. Rental housing can meet the needs of workers by providing them with a short-term, stable, and flexible living situation for the duration of their assignment. Rental housing includes houses, apartments, mobile homes, groups of rooms, and single rooms meant for occupancy (US Census Bureau 2023). It does not include dormitories, transient quarters like hotels and motels, or RVs.

Recent housing reports for Eastern Oregon suggest a shortage of rental housing units across the region. The 2023 Congressional District Housing Profile for Oregon's 2nd District (encompassing the eastern two-thirds of the state) identifies a deficit of 15,671, 18,039, and 5,584 affordable housing units for those households with incomes at or below 30 percent, 50 percent, and 91 percent average median income (AMI), respectively (NLIHC. 2023).

These findings are generally consistent with county- and municipality-level trends in the region. The 2019 *Morrow County Housing Strategies Report* suggests a need for affordable rental housing units to serve those households paying a high share of their income towards rent (Angelo Planning Group and Johnson Economics 2019). According to data from the Oregon Housing Alliance, Morrow County has a "serious shortage" of affordable housing. In 2021, there was a gap of 145 units needed to ensure families with extremely low incomes can find housing (Oregon Housing Alliance 2021).

Although the greatest need for rental units across the region appears to be among low-income households, some municipalities have observed a shortage in rental housing available to middle and high-income households as well. For instance, vacancy rates for rental units in the City of La Grande in Union County (which, while on the outside edge of the relevant commuting region, is indicative of trends in many communities in the region) have declined in recent years, resulting in a housing deficit at all income levels. The city has identified a need for 285 multi-family rental units to offset the existing shortage of supply (City of La Grande & Cascadia Partners 2021).

The shortage of rental housing, particularly affordable rental housing, in and around the project area will present a challenge for non-local workers involved in various phases of project build-out.

Table 8 summarizes the rental housing stock for the reasonable commuting area for the project. The final column shows the estimated number of vacant rental units as of 2021. The data in this table are drawn from the U.S. Census Bureau survey data but, particularly in small communities, have high margins of error and may not accurately reflect actual availability at the time of the survey, and don't precisely reflect current availability. Communities where this is of issue are indicated with asterisks. Rental housing in Morrow and Gilliam Counties is particularly scarce, though rental housing units make up almost half the housing stock in Boardman and Heppner, for example.

Table 10. Regional Rental Housing Stock

Source: U.S. Census Bureau. (2021). American Community Survey (ACS) Five-Year Estimates.

Location	Total Housing Units (Occupied or Vacant)	Percent of Housing Units that are Rentals	Percent of Rental Units that are Vacant	Estimated Number of Vacant Rental Units
Morrow County, OR	4,671	30	6	77
Boardman	1,180	49	5*	28*
Heppner	634	48	9*	28*
Ione	192	26	0*	0*
Irrigon	765	20	1*	2*
Lexington	68	6*	0*	0*
Umatilla County, OR	30,930	35	6	638
Echo	239	50	0*	0*
Hermiston	6,796	39	2	46
Stanfield	937	25	3*	6*
Umatilla	2,044	31	1*	9*
Pendleton	6,843	42	4	127
Pilot Rock	562	16	2*	1*
Gilliam County, OR	1,120	28	8	24
Arlington	246	29	2*	1*
Condon	499	22	4	5
Benton County, WA	79,020	33	2	631
Franklin County, WA	24,194	30	1	88
Total	**160,940**	-	-	**1,711**

Note: * indicates estimate has a large margin of error (using a 90% confidence level) and there is uncertainty in this result.

Hotels/Motels

Hotel/motel accommodations are plentiful in a 50-mile radius around the project site, which roughly corresponds to the study region (Figure 7). Establishments are concentrated in Hermiston, Pendleton, and Tri-Cities, between 30 and 60 miles away from the project site (Table 12 and Table 13). There are almost 6,000 rooms in this area. Just 4 percent are in Morrow County, while half of the rooms are in Benton County (Tri-Cities) and almost 30 percent are in Umatilla County.

Figure 7. Regional Hotel/Motel Locations

Source: ECONorthwest, with data from STR (2023)

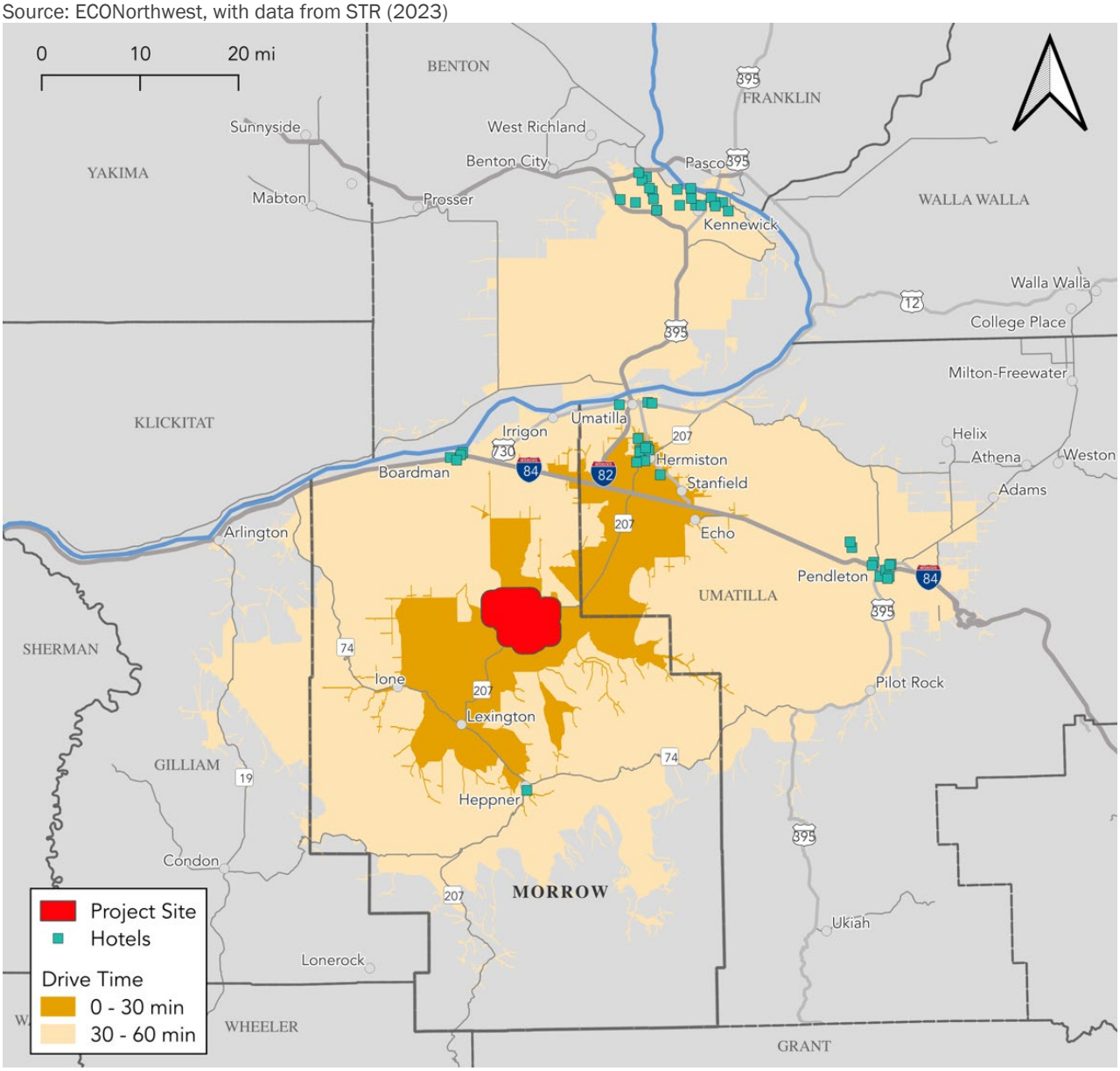


Table 11. Regional Hotel/Motels by City and County within 50-mile Radius of Project Site
Source: STR (2023)

Location	Total Hotel/Motels	Total Hotel Rooms	Percent of Total	Vacant Rooms at Peak Occupancy
Morrow County, OR	6	249	4%	57
Boardman	5	234		
Heppner	1	15		
Ione	0	0		
Irrigon	0	0		
Lexington	0	0		
Umatilla County, OR	28	1,725	29%	397
Echo	0	0		
Hermiston	9	656		
Stanfield	0	0		
Umatilla	3	142		
Pendleton	16	927		
Pilot Rock	0	0		
Gilliam County, OR	3	69	1%	16
Arlington	1	33		
Condon	2	36		
Benton County, WA	42	2,928	50%	673
Franklin County, WA	16	917	16%	211
Total	**95**	**5,888**	**100%**	**1,354**

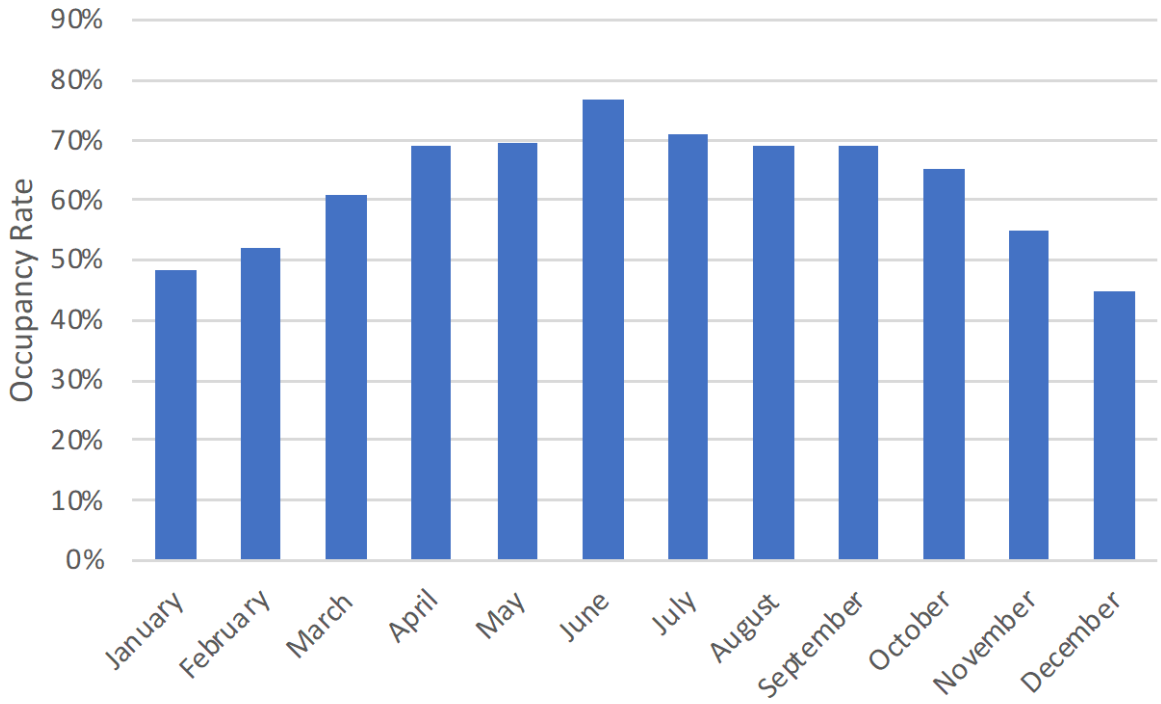
Note: Numbers may not sum due to rounding.

Table 12. Regional Hotel/Motels by Distance
Source: STR (2023)

Drive Time to Project Site	Number of Establishments	Number of Rooms
0 to 30 minutes	10	501
30 to 60 minutes	40	1,470
Total	**50**	**1,971**

Figure 8 shows seasonal occupancy patterns, with lower demand in the winter months and higher demand in the summer months. In the year April 2022 to April 2023, the lowest occupancy was 45 percent in December and the high was 77 percent in June, with an average annual vacancy rate of 37 percent. At the recent peak occupancy of 77 percent in June 2022, there were approximately 1,350 rooms available in the region.

Figure 8. Monthly Hotel/Motel Occupancy Rates, 2022-2023
Source: STR (2023)



RV Parks

RV sites with full hookups and dumpster access are a viable housing option for construction workers due to their convenience and affordability. Full hookups facilitate access to water, electricity, and sewage, while dump stations help maintain a hygienic environment with a convenient means of waste disposal. Many non-local construction workers travel with an RV to stay near a job site.

There are almost 3,000 RV sites in the project region. Like hotels and motels, they are concentrated along major highways in Oregon and Washington and are generally outside of the 30-minute drive time to the project site, with the majority between 30 and 60 miles away (Table 14, Table 15).

Based on a review of online sources, we identified seven RV Parks within Morrow County with 260 sites: one in Boardman, four in Heppner, and two in Irrigon. Those RV parks closest to the project site have a higher percent of hookups than those further away, though around two-thirds of all RV sites in the region offer a full hookup (Table 14).

The two largest RV parks in the region (both located in Hermiston, Oregon) responded to an interview request and identified construction workers as their most common long-term customers. They have annual occupancy rates ranging from 95 to 99 percent. Occupancy remains high throughout the year, and they are nearly always at capacity in the fall, spring, and summer (personal communication).

Figure 9. Regional RV Parks

Source: Travel Oregon (2023), Campendium (2023), Good Sam (2023)

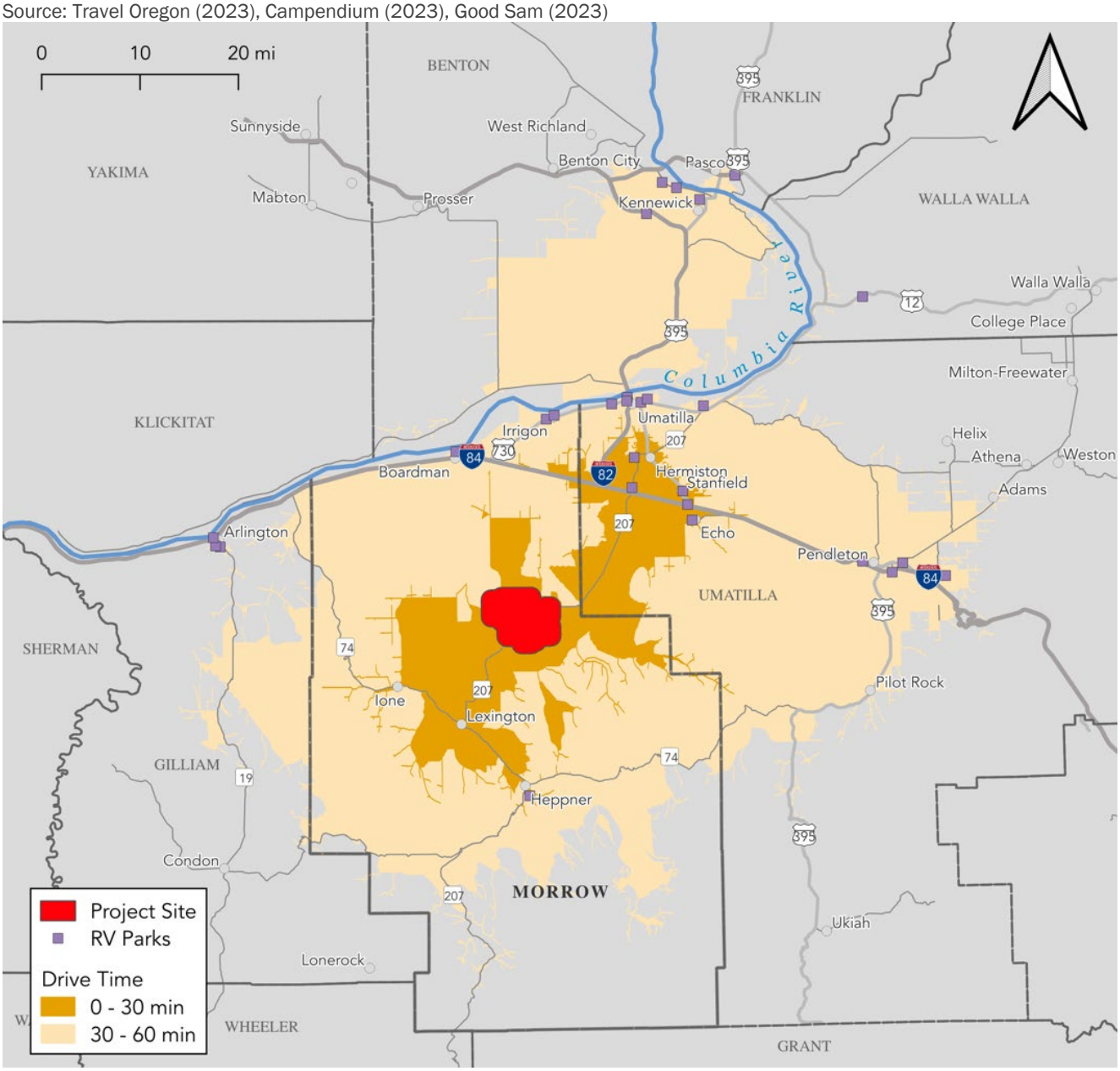


Table 13. Regional RV Park and RV Sites
Source: Travel Oregon (2023), Campendium (2023), Good Sam (2023)

Location	Total RV Parks	Total RV Sites
Morrow County, OR	7	260
Boardman	1	63
Heppner	4	74
Ione	0	0
Irrigon	2	123
Lexington	0	0
Umatilla County, OR	15	571
Echo	1	9
Hermiston	3	209
Stanfield	2	90
Umatilla	5	26
Pendleton	4	237
Pilot Rock	0	0
Gilliam County, OR	5	80
Arlington	3	54
Condon	2	26
Benton County, WA	11	1,395
Franklin County, WA	4	364
Total	**42**	**2,670**

Table 14. Regional RV Park Capacity and Amenities
Source: Travel Oregon (2023), Campendium (2023), Good Sam (2023)

Drive Time to Project Site	Number of Sites	Percent of Sites with Full Hookups	Percent of Sites with Dump Stations
0 to 30 minutes	274	76	86
30 to 60 minutes	1,105	76	48
Total (Average)	**1,379**	**(76)**	**(67)**

Summary of Available Housing Supply

Table 16 summarizes the supply of available housing by type and location. Housing supply is most constrained in Morrow and Gilliam Counties. The supply of rental housing is larger than transient lodging types in Umatilla County, while the reverse is true in Franklin County. Benton County offers the largest amounts of available lodging. The supply of hotel and motel rooms

would increase from this level during the winter months, while the supply of RV sites, particularly in Oregon, is relatively limited due to high occupancy rates year-round.

Table 15. Summary of Available Housing Supply by Type

Location	Vacant Rental Housing	Vacant Hotel/Motels	Vacant RV Parks[1]
Morrow County, OR	77	57	26
Umatilla County, OR	638	397	57
Gilliam County, OR	24	16	8
Benton County, WA	631	673	140
Franklin County, WA	88	211	36
Total	**1,458**	**1,354**	**267**

Notes: 1/Assumes 10% regional vacancy rate, which is higher than interviewees indicated for parks in Hermiston (5%).

Housing Demand

The project would stimulate demand for housing in the region when it employs workers who do not already live within commuting distance of the project. At the high end, all workers could come from outside of the labor market. Under this scenario, **at the peak of construction for the PV Solar Generation facility alone, about 675 workers would need housing. The combined PV Solar Generation facility and BESS would require about 950 workers at the peak of construction.**

The worker availability analysis gives another interpretation—based on the best available data at this time *and* a set of assumptions that are subject to substantial uncertainty—of the proportion of non-local workers who would temporarily relocate to the region for the duration of their employment. **At the peak of construction for the PV Solar Generation facility alone, this analysis suggests about 46 percent of the workforce or around 310 workers could be non-local. In a scenario where the PV Solar Generation facility and the BESS are constructed concurrently, about 47 percent or almost 450 workers could be non-local.**

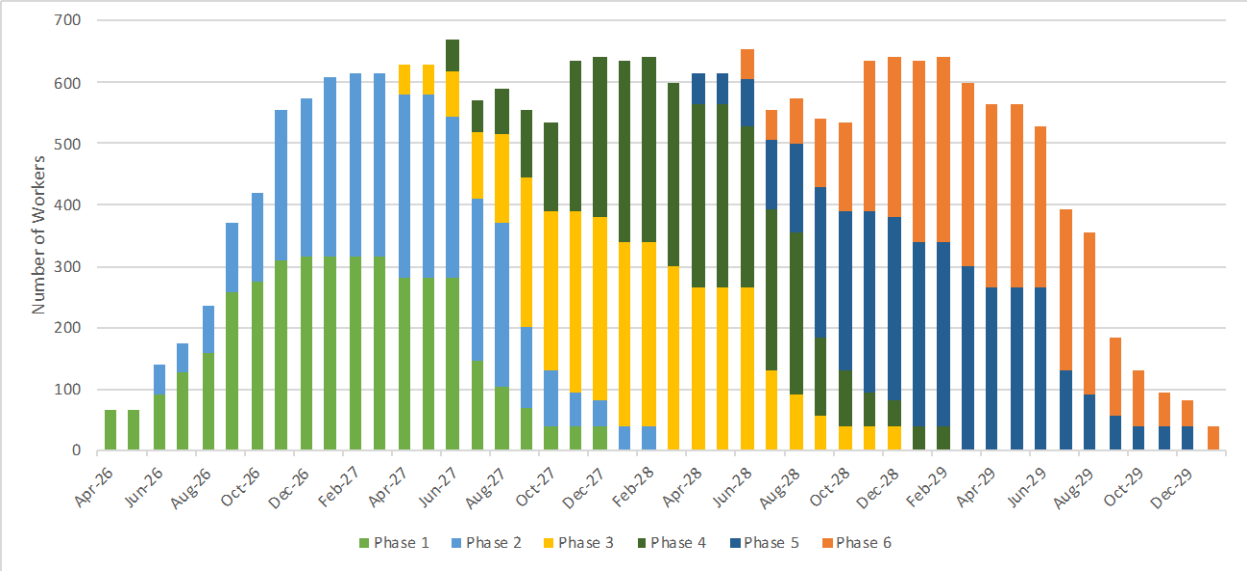
This estimate of non-local labor is highly sensitive to overall economic conditions, contractor hiring preferences and licensing requirements, project wages, and other factors, some of which the project developer can control and some they cannot. For example, if conditions placed on the project require a higher proportion of its workers to be licensed electricians versus construction laborers, proportionately more non-local workers would likely be drawn to the region because of the more limited supply of electricians in the region compared to construction laborers (see Table 8).

Solar-Only Scenario: PV Solar Generation Without BESS

Assuming all project personnel were to relocate from outside the region, at the peak of construction, about 670 workers would require housing. This peak level of construction would extend over a prolonged period. It rises above 500 workers in November of 2026 and does not

fall back below 500 workers until June 2029, a period of about 32 months or almost 3 years (Figure 10).

Figure 10. Total Workers by Project Phase for PV Solar Generation, 2026 to 2030
Source: ECONorthwest Analysis of PGR data



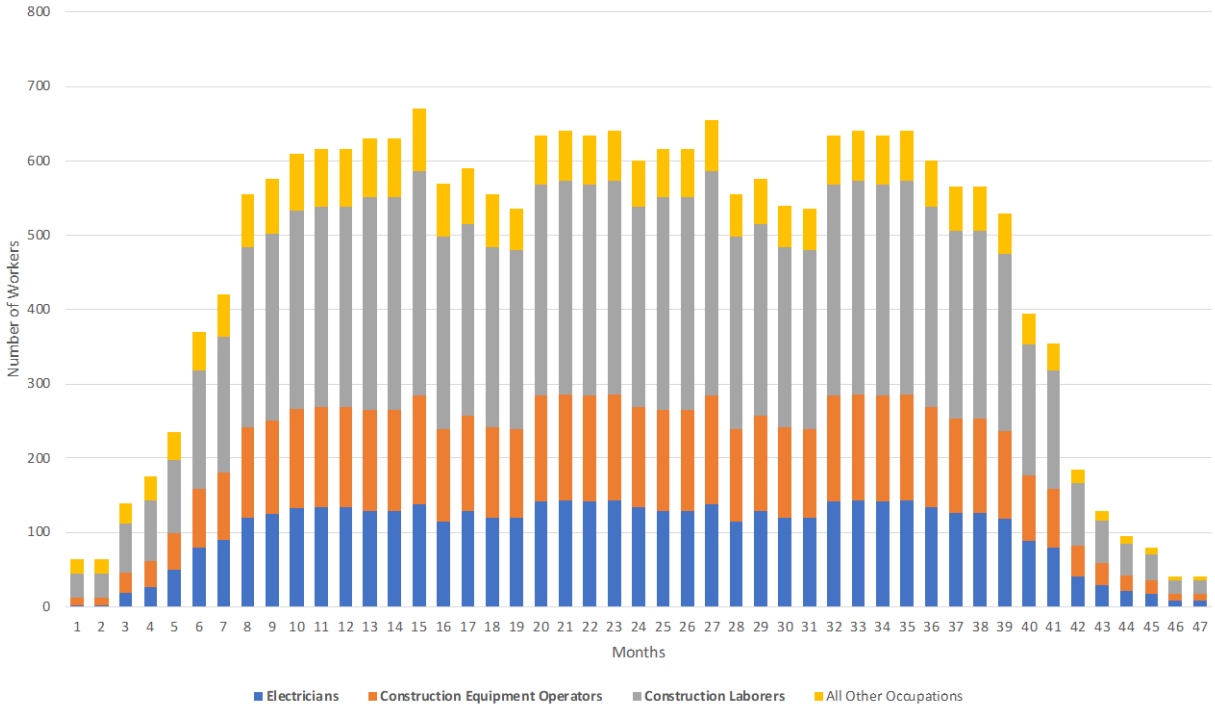
This does not necessarily mean that the same workers will be employed for the duration. Individual workers may come and go throughout project construction. These patterns have implications for the type of housing workers might demand. For those who commit to the project for the duration (up to 3 years) and cycle from one phase to the next without significant interruption, renting a house or apartment would likely make more sense than renting a hotel/motel room or RV site. For those who are employed more sporadically or for a shorter duration, transient lodging may make more sense. Construction workers in this situation often rent accommodations during the week and commute back to their home or travel elsewhere on the weekends.

For the largest categories of workers who would come from outside the region, the peak is sustained in a similar pattern to total workers. Electricians, for example, reach the peak of about 120 workers in month 8 and don't fall much below that peak for 32 months, as Figure 13 shows. If about half of the workers in the three major categories (electricians, construction laborers, and construction equipment operators) relocate from outside the region, it would generate sustained demand for housing from over 100 workers for three consecutive years and from between 200 and almost 300 workers for 32 months. If all workers came from outside the region, demand for housing would substantially increase immediately and fluctuate between 400 and 600 workers for that period.

Workers do not necessarily require their own private accommodations. Often construction workers share accommodations which reduces for housing units demand compared to total construction personnel. **If all construction workers doubled up, demand for housing units at 100-percent non-local workers at the peak of construction would be at most 335 units for a**

month and almost 200 units on average for the duration of the construction period. Under local worker availability assumptions where 46 percent of the workforce is non-local, if they doubled up, total unit demand at peak would be about 155 units. Assuming single occupancy, these estimates of housing unit demand at peak would increase to about 670 and 310 units respectively.

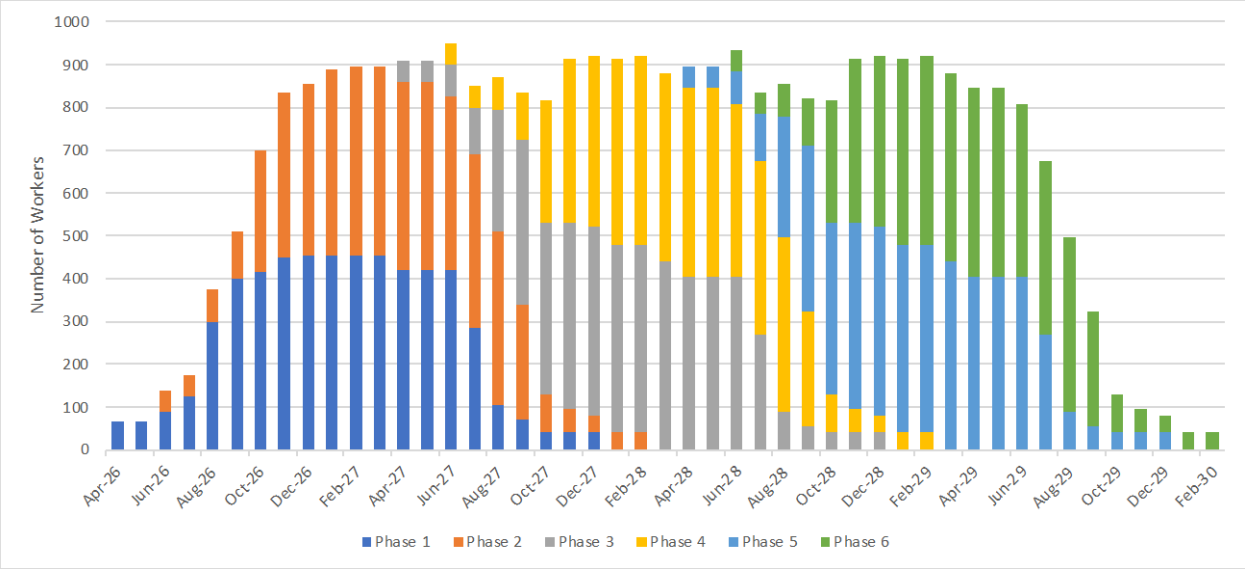
Figure 11. Workers by Occupation for PV Solar Generation Alone, 2026 to 2030
Source: ECONorthwest analysis of PGR data



Combined Scenario: PV Solar Generation and BESS Housing Demand

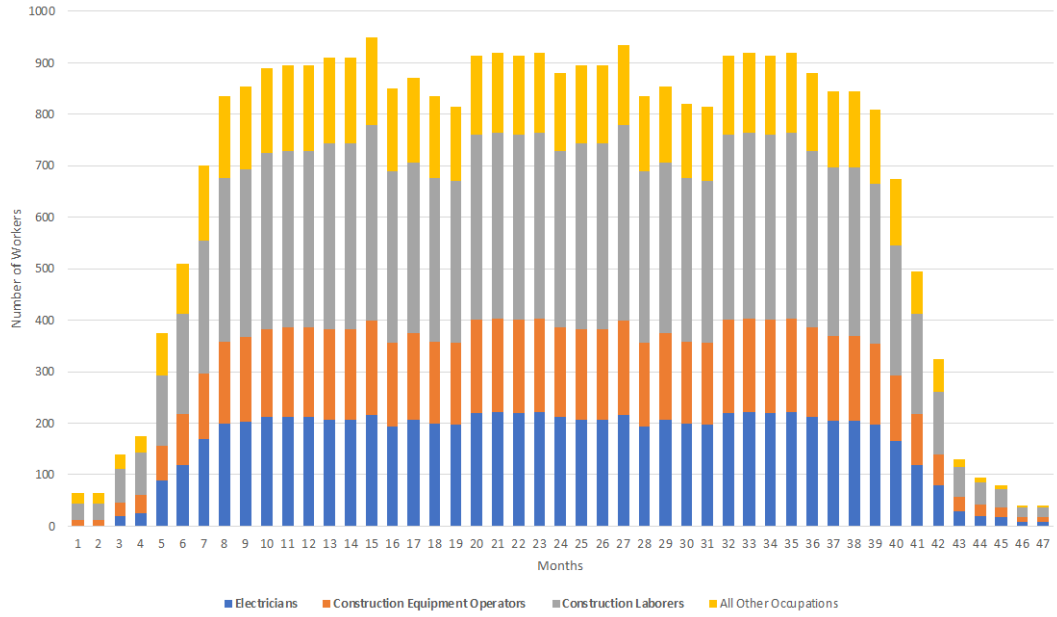
A highest impact scenario from a housing perspective would occur if the PV Solar Generation and BESS project components were built concurrently and all project personnel were to relocate from outside the region. In this case, at the peak of construction, about 950 workers would require housing. This peak level of construction would extend over a prolonged period. It rises above 500 workers in August of 2026 and does not fall back below 500 workers until August 2029, a period of about 35 months or almost 3 years (Figure 12).

Figure 12. Total Workers by Project Phase PV Solar Generation and BESS, 2026 to 2030
Source: ECONorthwest Analysis of PGR data



For the largest categories of workers who would come from outside the region, the peak is sustained in a similar pattern to total workers. Electricians, for example reach the peak of about 200 workers in month 8 and don't fall much below that peak for 30 months, as Figure 13 shows. If about half of the workers in the three major categories relocate from outside the region, it would generate sustained demand for housing from over 100 workers for the duration of construction and from between 300 and 400 workers for 32 months. If all workers came from outside the region, demand for housing would substantially increase immediately and fluctuate between 700 and 900 workers for 34 months.

Figure 13. Workers by Occupation for PV Solar Generation and BESS, 2026 to 2030
Source: ECONorthwest analysis of PGR data



If all construction workers doubled up, demand for housing units at 100-percent non-local workers at the peak of construction would be 475 units. Under local worker availability assumptions where 45 percent of the workforce is non-local, if they doubled up, total unit demand at peak would be 225 units. Assuming single occupancy, these estimates of housing unit demand would increase to 950 and 450 units respectively.

Housing Availability Impacts

The analysis of rental and transient lodging supply shows that the region can likely supply 1,458 units of rental housing and 1,621 units of transient lodging, for a total of 3,079 units of total housing (Table 17). This is well above the high estimate of housing unit demand, 950 units (Table 18). Thus, it is likely that within the region, the housing market could comfortably be able to accommodate the anticipated influx of non-local construction workers under both the 100-percent or reduced non-local workforce assumptions for the solar-only and combined scenarios.

Table 16. Summary of Housing Supply
Source: ECONorthwest analysis of sources described above

Location	Total Vacant Units Rental Housing	Total Vacant Units Transient Lodging	Total Vacant Housing Units
Morrow County, OR	77	83	160
Umatilla County, OR	638	454	1,092
Gilliam County, OR	24	24	48
Benton County, WA	631	813	1,444
Franklin County, WA	88	247	335
Total	**1,458**	**1,621**	**3,079**

Table 17. Summary of Housing Demand
Source: ECONorthwest analysis of sources described above

	Single Occupancy Unit Demand (Peak Construction)		Double Occupancy Unit Demand (Peak Construction)	
Scenario	100-Percent Non-Local	Workforce Analysis Non-Local	100-Percent Non-Local	Workforce Analysis Non-Local
PV Solar Generation	670	335	310	155
PV Solar Generation + BESS	950	450	475	225

For workers seeking transient lodging, the market also has capacity to absorb the influx of demand, even at peak occupancy rates during the summer season. Again, most of these workers would need to locate in Umatilla County or in the Tri-Cities area. Hotels and motels are substantially more available than RV sites. For workers who expect to stay in an RV, they

will have difficulty finding full-hookup sites in Oregon during most of the year, and especially during the summer months.

If workers are indifferent to location and price, all workers who would prefer rental housing over transient lodging because, for example, they plan to work on the project for more than a year and could enter a year-long lease, could find rental housing. However, workers are not indifferent to location and price, and this influx of demand could create substantial upward pressure on rent in the already tight rental housing markets in Morrow and Umatilla Counties. Because of these constrained market conditions, workers for this project would likely follow location patterns already observed for workers at major regional employers like the Port of Morrow, where substantial proportions of the workforce commute from Tri-Cities (WSP and FCS Group 2020).

While the regional supply of housing can accommodate project-related demand, the housing supply in Morrow County alone will not accommodate all workers at peak construction in any scenario except under the solar facility alone assuming double occupancy. In this scenario worker demand for housing at double-occupancy is approximately equal to vacant housing supply in Morrow County: at most, Morrow County will be able to absorb about 150 workers, assuming double-occupancy in transient lodging. If rental vacancy is accurate according to the data shown in Table 17, another 150 workers could be housed in apartments and rental houses at double occupancy. However, this would consume all available lodging and displace demand generated through natural population growth and other economic development activity likely to occur through 2030. Even if new housing is developed in Morrow County, it is unlikely to materialize at a pace that would substantially relieve the market pressures project-related housing demand would create. It may, however, create opportunities for existing residents who could rent rooms in their homes and generate income. This is a common market response to increased temporary housing demand in tight markets and may help ease pressure on the market in Morrow County somewhat.

Potential Mitigation Options

Although housing supply is sufficient to meet peak project demand within the region, the housing markets closest to the project site in Morrow and Umatilla Counties are more constrained and thus more vulnerable to project impacts. Here are some potential options for addressing those county-specific impacts.

- In cooperation with local housing officials, develop a detailed housing plan consistent with updated workforce estimates prior to construction.
- Provide housing information to workers prior to the start of their employment.
- Hire a project housing coordinator to manage housing-related planning and communication with employees, housing providers, and local officials, as detailed below.

- Work proactively with incoming workers to identify housing options and minimize potential issues finding suitable and affordable housing. Transportation to and from housing should also be considered, as much of the housing supply is more than a 30-minute commute to the project site.
- Work with local officials and local housing providers to ensure information provided to workers is up to date and consistent with local housing policies and objectives.
- Work with local officials to preemptively address potential issues related to constraints on RV sites and hookups. This housing option is more limited than other options, which may lead workers to use unauthorized sites and increase issues with illicit dumping. If a problem is observed, consider working with County officials to identify opportunities to expand RV capacity, within the scope of County rules for RV park development.
- Work with Project contractors to track and assess non-local worker demographics, including tracking permanent and temporary residential locations and the type of temporary housing used. Use this information to identify patterns of use and proactively identify potential shortages or changes in housing demand.
- Consider providing support to local housing advocacy organizations to augment resources available to low-income residents who may experience further affordability challenges with increased project-related housing demand.

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Attachment U-2. Record of Correspondence with Finley Buttes Regional Landfill

From:	Jocelyn Jones
To:	Gulick, Kristen
Subject:	RE: ATTENTION/RESPONSE REQUESTED: Finley Buttes Landfill"s Office Consultation Regarding the Echo Solar Project
Date:	Tuesday, November 22, 2022 11:26:26 AM
Attachments:	image002.png

Good Morning Kristen,
Yes Finley Buttes is still able to accept the quantities proposed. Finley has a proposed life span of 180 more years with no restrictions to quantities accepted.

Thanks,
Jocelyn

From: Gulick, Kristen <Kristen.Gulick@tetratech.com>
Sent: Monday, November 21, 2022 2:44 PM
To: Jocelyn Jones <Jocelyn.Jones@WasteConnections.com>
Cc: Jocelyn Jones <Jocelyn.Jones@WasteConnections.com>
Subject: ATTENTION/RESPONSE REQUESTED: Finley Buttes Landfill's Office Consultation Regarding the Echo Solar Project

Hello,
I am contacting you on behalf of the proposed Echo Solar Project (Echo Solar). Echo Solar is a proposed 1,250-megawatt solar photovoltaic power generation facility in Morrow County, Oregon owned by Pine Gate Renewables, LLC (Pine Gate). More information on Echo Solar can be found here: https://www.oregon.gov/energy/facilities-safety/facilities/Pages/ESP.aspx

Our current, conservative, estimate of non-hazardous waste anticipated for facility construction over a 9 to 12-month period is 13,000 cubic yards. Tetra Tech is under contract to Pine Gate through the Oregon Dept. of Energy's (ODOE) permitting process. To this end, we will provide to ODOE evidence of consultation with local municipalities that we have been in contact regarding waste services for the construction of Echo Solar. At this point in the process, Pine Gate is not required to have entered into a contract with the Finley Buttes Landfill, we just need to demonstrate to ODOE that we have been in consultation with the Finley Buttes Landfill and that yes, you are able to provide waste services, as well as any constraints you may have (e.g., capacity available). Any letter from you to me on this subject does not constitute a contract and you are under no obligation to supply waste services for the facility.
If you could please provide a letter addressing Echo Solar as soon as possible, that would be greatly appreciated. It can be a statement on your letterhead with your signature if you like, or even a reply to this email. A mention of when the landfill is projected to reach capacity would be great to include, for Echo Solar has an anticipated lifespan of up to 50 years, which would include retirement and decommission waste disposal.
Thank you in advance and let me know if you have any questions!

Sincerely,

Kristen Gulick (she/her) | Environmental Planner II | Tetra Tech
Mobile (**541) 740-3316** | kristen.gulick@tetratech.com

Attachment U-3. Record of Correspondence with Morrow County Sheriff's Department

MORROW COUNTY SHERIFF
325 Willow View Drive • P.O. Box 159
Heppner, Oregon 97836
Phone: (541) 676-5317
Fax: (541) 676-5577

John A. Bowles, Sheriff
Brian L. Snyder, Undersheriff

To: Kristen Gulick (Echo Solar)
From: Brian L. Snyder, Undersheriff
RE: Echo Solar Project in Morrow County

The Morrow County Sheriff's Office is the primary Law Enforcement agency for the area in which the Echo Solar Energy Facility Project will be located. This project is in a low to medium crime area in our county.

The Sheriff's Office will respond appropriately and as necessary to all complaints that are reported in this area. We do not expect this project to adversely affect the Morrow County Sheriff's Office in terms of additional workload.

If you have any questions, feel free to give me a call at 541-676-5317.

Sincerely,

Brian Snyder

Brian L. Snyder,
Undersheriff
Morrow County Sheriff's Office

Attachment U-4. Record of Correspondence with Ione Rural Fire Protection District

From: Debbie Morgan
To: Gulick, Kristen
Subject: Re: ATTENTION/RESPONSE REQUESTED: Ione Rural Fire Protection District"s Consultation Regarding the Echo Solar Project
Date: Tuesday, December 27, 2022 1:04:35 PM

Tetra Tech
Echo Solar project
12-27-2022

For the Echo Solar project, from the Ione Rural Fire Protection District. We are not able to provide high angle rescue & confined space rescue. Other than those, we are able to provide fire fighting services for this project.

Ione Rural Fire Protection District
Virgil L. Morgan
Ione Fire Chief
Sent from my iPhone

> On Dec 22, 2022, at 9:06 AM, Gulick, Kristen <Kristen.Gulick@tetratech.com> wrote:
>
> Hi there,
> Sorry for the confusion, but I just wanted to clarify. This request is for a different project from the one I contacted you previously about. The Echo Solar Project is nearby the previously discussed project.
>
> Apologies again for the confusion!
> Sincerely,
>
> Kristen Gulick
>
> Get Outlook for iOS
>
> ---
>
> **From:** Gulick, Kristen
> **Sent:** Monday, December 19, 2022 9:44:34 AM
> **To:** VIRBIEMORGAN@NETSCAPE.NET <virbiemorgan@netscape.net>
> **Subject:** FW: ATTENTION/RESPONSE REQUESTED: Ione Rural Fire Protection District's Consultation Regarding the Echo Solar Project
>
> Hello,
> I am contacting you on behalf of the proposed Echo Solar Project (Echo Solar). Echo Solar is a proposed 1,250-megawatt solar photovoltaic power generation facility in Morrow County, Oregon owned by Pine Gate Renewables, LLC (Pine Gate). More

information on Echo Solar can be found here:
https://www.oregon.gov/energy/facilities-safety/facilities/Pages/ESP.aspx

Tetra Tech is under contract to Pine Gate through the Oregon Dept. of Energy's (ODOE) permitting process. To this end, we will provide to ODOE evidence of consultation with local municipalities that we have been in contact regarding fire protection for the construction of Echo Solar. At this point in the process, Pine Gate is not required to have entered into a contract with the Ione Rural Fire Protection District, we just need to demonstrate to ODOE that we have been in consultation with the Ione Rural Fire Protection District and that yes, you are able to provide fire protection services, as well as any constraints you may have (e.g., high angle, confined space rescue). Any letter from you to me on this subject does not constitute a contract and you are under no obligation to supply fire protection services for the facility.
If you could please provide a letter addressing Echo Solar as soon as possible, that would be greatly appreciated. It can be a statement on your letterhead with your signature if you like, or even a reply to this email.
Thank you in advance and let me know if you have any questions!
Sincerely,

Kristen Gulick (she/her) | Environmental Planner II | Tetra Tech
Mobile (**541) 740-3316** | kristen.gulick@tetratech.com

Attachment U-5. Record of Correspondence with Boardman Fire Rescue District

From:	Michael Hughes
To:	Gulick, Kristen
Cc:	Boardman Fire; Suzanne Gray
Subject:	Re: ATTENTION/RESPONSE REQUESTED: Boardman Fire Rescue District"s Consultation Regarding the Echo Solar Project
Date:	Monday, November 21, 2022 3:04:47 PM
Attachments:	image001.png

Hi Kristen,

Your proposed construction location is within our response district. BFRD is an all risk full-time professional organization. We provide ALS emergency medical services, fire protection including wildfire mitigation and structural firefighting. We also provide confined space rescue and will be certified in trench rescue operations in March 2023. Our services are provided 24 hours a day, 365 days per year.

Please let me know if you have any further questions or concerns.

Thank you,

Mike Hughes
Fire Chief
Boardman Fire Rescue District
300 SW Wilson Lane
Boardman, OR 97818
Office: 541-481-3473
Cell: 541-561-2464

> On Nov 21, 2022, at 2:51 PM, Gulick, Kristen <Kristen.Gulick@tetratech.com> wrote:
>
> Hello,
> I am contacting you on behalf of the proposed Echo Solar Project (Echo Solar). Echo Solar is a proposed 1,250-megawatt solar photovoltaic power generation facility in Morrow County, Oregon owned by Pine Gate Renewables, LLC (Pine Gate). More information on Echo Solar can be found here: https://www.oregon.gov/energy/facilities-safety/facilities/Pages/ESP.aspx
>
> Tetra Tech is under contract to Pine Gate through the Oregon Dept. of Energy's (ODOE) permitting process. To this end, we will provide to ODOE evidence of consultation with local municipalities that we have been in contact regarding fire protection for the construction of Echo Solar. At this point in the process, Pine Gate is not required to have entered into a contract with the Boardman Fire Rescue District, we just need to demonstrate to ODOE that we have been in consultation with the Boardman Fire

Rescue District and that yes, you are able to provide fire protection services, as well as any constraints you may have (e.g., high angle, confined space rescue). Any letter from you to me on this subject does not constitute a contract and you are under no obligation to supply fire protection services for the facility.
If you could please provide a letter addressing Echo Solar as soon as possible, that would be greatly appreciated. It can be a statement on your letterhead with your signature if you like, or even a reply to this email.
Thank you in advance and let me know if you have any questions!
Sincerely,

Kristen Gulick (she/her) | Environmental Planner II | Tetra Tech
Mobile (**541) 740-3316** | kristen.gulick@tetratech.com

<image001.png>

Attachment U-6. Traffic Impact Assessment

Sunstone Solar Energy Project
Traffic Impact Assessment

December 1, 2023

PREPARED FOR:

Sunstone Solar, LLC.
130 Roberts Street
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Civil Engineer VI

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Project Manager

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
ADT	Average Daily Traffic
AOI	Area of Interest
ODOT	Oregon Department of Transportation
HCM	Highway Capacity Manual
LOS	Level of Service
MW	Megawatt
PGR	Pine Gate Renewables
Tetra Tech	Tetra Tech, Inc.
TIA	Traffic Impact Assessment

1.0 INTRODUCTION

1.1 PROJECT OVERVIEW

Pine Gate Renewables, LLC (PGR) is proposing the construction and operation of the Sunstone Solar Project (Project), a solar generation facility and related or supporting facilities in Morrow County, Oregon. The site is located southeast of the Boardman Bombing Range and is adjacent to Oregon Route 207/Lexington-Echo Highway (OR-207) **(Figure 1)**. Construction of the Project is anticipated to commence as early as April 2026 pending site certification and changes due to economic conditions, business development priorities, permitting delays, weather constraints, and contract availability. The construction effort is anticipated to last approximately 47 months.

1.2 STUDY PURPOSE

Tetra Tech Inc. (Tetra Tech) has prepared this Traffic Impact Assessment (TIA) on behalf of PGR to qualify and quantify potential impacts from the construction and operation of the Project on the local transportation infrastructure, which is maintained by Morrow County and the Oregon Department of Transportation (ODOT). The TIA has been prepared to provide these authorities with the information necessary for consideration and approval of the Project, as well as meeting the site certification information needs of the Energy Facility Siting Council (EFSC).

Morrow County requires a TIA to be performed for a proposed development if more than 400 passenger car equivalent (PCE) trips per day are being generated by the development (Morrow County Zoning Ordinance Article 6, Section 6.030, 2017). The project will exceed 400 PCE trips per day during construction, but will generate considerably fewer trips than that threshold during operations.

1.3 SITE LOCATION AND STUDY AREA OF INTEREST

The Project is located in Morrow County on an approximately 10,900-acre site adjacent to OR-207 and southeast of the Boardman Bombing Range **(see Figure 1)**. Tetra Tech's TIA is focused on the roads and intersections most likely to be used by the project during construction. The proposed haul routes, depicted on **Figure 1**, will be used by workers and delivery of materials and equipment necessary to develop the Project.

The Project will be accessed primarily from I-84 to Bombing Range Road by using the I-84/US-730 junction and continuing south to the project boundary. Additional interior Project access roads will be constructed as well. An alternate transportation route will be via I-84 to OR-207. Vehicles would continue southwest to exit on to Doherty Road or Grieb Lane in order to access the portion of the site boundary north of OR-207. Some of the workforce traffic may originate from the south, in which case they will likely take OR-207 going north to reach the project site.

The area of interest (AOI) identified for the Project refers to the roads and intersections that are primarily impacted by the Project's development. The Morrow County Zoning Ordinance specifies that a TIA should identify intersections for which the project adds 30 or more peak hour PCE trips. For the purposes of the TIA, the AOI is not a finite bounded area, but rather nearby intersections that are the most likely to experience more than 30 peak hour trips.

The AOIs for this TIA are as follows:

- Intersection of US-730 and Bombing Range Road
- Intersection of Alpine Lane and Bombing Range Road
- Intersection of Grieb-Wood Road and Bombing Range Road

- Intersection of Driveway and Bombing Range Road
- Intersection of Grieb Lane and Bombing Range Road
- Intersection of Grieb Lane and OR-207
- Intersection of Lower Sand Hollow Road and OR-207

The selection of the AOIs is discussed further in Section 2.1, Existing Infrastructure.

1.4 STUDY METHODOLOGY

The TIA was designed to evaluate the significance and acceptability of potential impacts associated with routing Project traffic to and from the site via the major local intersections and roads on the designated haul routes. This was accomplished by evaluating the potential change to the Level of Service (LOS) rating, where possible, of the infrastructure caused by construction and operations at notable intersections. For some of the intersections included in the AOI, little to no traffic data exists for smaller roads. Due to this, a LOS analysis was not completed.

Had the initial analysis of change to LOS rating indicated potential for an unacceptable LOS impact at these intersections, additional LOS study of other intersections along the haul routes, and/or further analysis of traffic impact mitigation options (e.g., signal timing optimization, signal warrants, or turn lane warrants analyses) would have been considered. As discussed in Section 3, Project Traffic Generation, operational phase traffic will be considerably lower than trip generation during construction. Therefore, the highest potential for impact will occur during the construction phase.

Traffic data available for roadways in the area is limited to I-84, Bombing Range Road, OR-207, and US-730. As the traffic counts on the rural routes in the project vicinity are likely very low, no new traffic counts were collected as part of this analysis. To analyze the LOS at intersections with traffic data, assumptions were made on turning movement counts based on the number of vehicles on the intersecting roads. Explanation and justification for the intersections that are analyzed is provided in Section 2.1, Existing Infrastructure.

Estimates of AM and PM Peak Hour traffic generated by construction through intersections that could not be evaluated for LOS have been provided.

1.4.1 Level of Service

The accepted method for rating performance of roads and intersections is the LOS method. LOS is a qualitative measure that predicts the quality of experience by motorists using the infrastructure. The analysis evaluates impacts as the potential change to the LOS of roadways and intersections anticipated to be impacted by Project development. Procedures used in the analysis are based on the *Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis* (HCM; NAS 2022), which is the nationally accepted standard used by most transportation engineering professionals and jurisdictions guidelines for determining LOS (HCM; NAS 2022). The LOS analysis provides a standardized means of categorizing efficiency and experiential quality by assigning a letter grade to it. As shown in **Table 1**, LOS ranges from A to F, with A and B representing the best conditions (i.e., little to no delay). LOS C is considered the lowest acceptable LOS in rural areas, LOS D is considered the lowest acceptable LOS in urban areas, E is reflective of a road or intersection at its maximum capacity, and F represents failure of the infrastructure (unacceptably high congestion and delays). Any change in LOS rating caused by a project is considered a significant impact. A significant impact does not always mean that mitigation is necessary, particularly if the impact is temporary in nature. The lowest acceptable LOS values (C for rural and D for Urban) are intended to be the thresholds for consistent long-term operational LOS. These values are used as is for acceptability of construction impacts, but duration is also considered when assessing what, if any, mitigation is required.

The LOS performance measure for an intersection is based on the expected 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 interrupt traffic flow in a roadway network to improve the quality of service at an intersection to reduce traffic conflicts, delay, and improve a driver's decision for making controlled turns. The LOS for both types of analysis are done for a peak hour. The peak hour is typically morning and/or evening commuting times, but it can vary, especially in rural areas. The HCM stipulates that if peak hour traffic volume is not known, peak traffic volume can be assumed to be 10% of the average daily traffic (ADT) volume. This analysis assumes that the peak hour for existing traffic is the same as the peak hour for Project worker traffic so that the analyzed condition will be conservative. This standard method provides the worst-case LOS that provides a basis to assume that if the worst-case LOS is acceptable, then LOS during any time is acceptable. Further, the comparative analysis considers the peak workforce for construction for the same reason. See **Table 1** for HCM intersection LOS definitions.

Table 1 – LOS Definitions

LOS	Signalized Intersection Delay (seconds)	Unsignalized intersection Delay (seconds)
A	0-10	0-10
B	10-20	10-15
C	21-35	16-25
D	36-55	26-35
E	56-80	36-50
F	>80	>50

Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis (HCM; NAS 2022)

The delay must be analyzed for each turning movement at the intersection. To analyze LOS, intersections are broken up into turning movements. A turning movement is one of the individual movements that can be taken by a vehicle at an intersection (e.g., westbound left turn, northbound through movement, etc.) There are many variables that impact intersection function and how drivers behave within them, including geometry, presence of pedestrians and bikes, lane width, grade, theoretical maximum movement counts if no traffic is present at any other movement/lane group, and conflicting traffic demand volume. Geometry is the physical layout of the intersection such as a "T" or "4 leg" intersection and the number of lanes for each direction. Pedestrian and bike crossings will impede traffic, so estimates on the hourly pedestrian volumes are important but are assumed to be zero as the AOI is rural. Lane width affects a driver's comfort and ultimately how quickly the driver can negotiate the movement as well as the length of time it takes a pedestrian to cross. The theoretical maximum capacity (i.e., saturation flow rate from the HCM) is 1,800 passenger cars per hour per lane for a free-flowing lane (NAS 2022). Finally, conflicting volume is the number of cars that would impede completing a safe movement (i.e., right turns merging with conflicting cross traffic).

2.0 EXISTING TRAFFIC CONDITIONS

The areas directly adjacent to the Project parcels are expected to see minimal development in the near future, primarily due to the rural or semi-rural nature of surrounding land use. Therefore, a slow increase to traffic volume is anticipated. Any near-term growth during the Project construction periods would likely be concentrated in the existing developed corridors adjacent to OR-207. There are no known coincidental projects planned in the AOI during the construction period of the Project.

2.1 EXISTING INFRASTRUCTURE

A summary of the existing infrastructure, including major intersections and road segments that will be utilized by Avangrid is provided below. The location of project driveways as described in the road segment descriptions are shown in **Figure 1**.

2.2 SUNSTONE SOLAR PROJECT HAUL ROUTE

Road Segment 1: I-84: I-84 is an interstate highway running east/west through Oregon along the Columbia River. Within the Project route area, it is a four-lane divided highway. It connects Project traffic to US-730 and OR-207.

Road Segment 2: US-730: US-730 connects I-84 to the northern terminus of Bombing Range Road. It forms a T-intersection with Bombing Range Road forming a T with the continuous alignment of two I-84 off ramps and US-730 from the northeast. The section being examined is two lanes with a paved, painted median in the middle as it crosses under I-84.

Road Segment 3: OR-207: OR-207 is a two-lane highway that may carry project traffic southwest from I-84 to numerous project driveways and intersections of interest, specifically at Lower Sand Hollow Road and Grieb Lane. OR-207 is an alternative route to Bombing Range Road. In addition, for Project traffic approaching the site from the south via Oregon Route 74 (OR-74), OR-207 provides access to the Project site.

Road Segment 4: Bombing Range Road: Bombing Range Road is a 2-lane paved route that connects US-730 to the Project area. It intersects with several project driveways as well as other roads in the vicinity that connect construction traffic to other project driveways. These connecting roads include Alpine Lane, Grieb-Wood Road, and Grieb Lane.

Road Segment 4: Alpine Lane: Alpine Lane is a two-lane asphalt rural road connecting Bombing Range Road to several Project driveways to access the northern parcels of the site.

Road Segment 5: Grieb-Wood Road: Grieb-Wood Road is a 22-foot wide gravel road connecting Bombing Range Road to some Project driveways to access the western parcels of the site.

Road Segment 6: Grieb Lane: Grieb Lane is a 20 to 22-foot wide gravel road connecting Bombing Range Road to the west with OR-207 to the east. It will also provide access to several project driveways.

Road Segment 7: Lower Sand Hollow Road: Lower Sand Hollow Road is an unmarked asphalt two-lane road connecting various Project driveways to OR-207.

Study Intersection 1: US-730 at Bombing Range Road: This intersection is a T-intersection, with Bombing Range Road being controlled by a stop sign and US-730/I-84 on ramps having the right of way. Adequate traffic data exists to perform a LOS analysis at this intersection.

Study Intersection 2: Alpine Lane at Bombing Range Road: This intersection is a one-way stop intersection with Alpine Lane coming to a T with Bombing Range Road. Traffic on Bombing Range Road has the right of way. Insufficient traffic count data exists at this intersection, therefore a LOS analysis was not possible.

Study Intersection 3: Grieb-Wood Road at Bombing Range Road: This intersection is a two-way stop intersection with Bombing Range Road having the right of way. Opposite Grieb-Wood Road is an unnamed access road that will not be used for project access. Insufficient traffic count data exists at this intersection, therefore a LOS analysis was not possible.

Study Intersection 4: Project Driveway at Bombing Range Road: This intersection is a one-way stop intersection with Bombing Range Road having the right of way. Insufficient traffic count data exists at this intersection, therefore a LOS analysis was not possible.

Study Intersection 5: Grieb Lane at Bombing Range Road: This intersection is a one-way stop intersection with Bombing Range Road having the right of way. Insufficient traffic count data exists at this intersection, therefore a LOS analysis was not possible.

Study Intersection 6: Grieb Lane at OR-207: This intersection is a one-way stop intersection with OR-207 having the right of way. Traffic data is available for OR-207, so a LOS analysis was completed. However, no traffic count data is available for Grieb Lane, so a reasonable estimate based on the properties around Grieb Lane was used.

Study Intersection 7: Lower Sand Hollow Road at OR-207: This intersection is a one-way stop intersection with OR-207 having the right of way. Traffic data is available for OR-207, so a LOS analysis was completed. However, no traffic count data is available for Lower Sand Hollow Road, so a reasonable estimate based on the properties around Lower Sand Hollow Road was used.

2.3 TRAFFIC CONDITIONS WITHOUT DEVELOPMENT

Tetra Tech obtained available traffic count data for the AOI from ODOT's TransGIS website (ODOT, 2023). Our review of the data indicate traffic conditions along the haul routes are good. Generally, the traffic volumes are well within acceptable limits. Typically, the peak hour is approximately 10% of ADT, and per HCM guidelines, this is the standard value to assumed when the actual peak hour is unknown. Therefore, the peak hour was assumed to be 10% of ADT for routes where specific peak hour counts were not available. See **Table 2** for a summary of the available traffic data. **Table 3** provides estimates for the growth in existing traffic during peak construction, which will likely occur in 2027-2028. To be conservative, 2028 was used. Due to the rural nature of the area surrounding the site, a 1% growth rate was used.

Table 2 – 2023 Available Traffic Data

Road	Data Source	Data Year	Average Daily Traffic	Peak Hour	
US-730				AM	PM
US-730 just north of I-84	ODOT TransGIS	2021	4264	426	426
Bombing Range Road					
Directly south of Intersection with US-730	ODOT TransGIS	2021	2087	209	209
I-84					
Eastbound I-84 on ramp from Bombing Range Road	ODOT TransGIS	2021	673	67	67
OR-207					
South of Grieb Lane	ODOT TransGIS	2021	1005	100	100
North of Lower Sand Hollow Road	ODOT TransGIS	2021	995	100	100

Note: The peak hour is assumed to be 10% ADT if no data was available.

This data was used to examine the existing conditions at the intersections with available traffic counts following the LOS analysis method previously described.

Table 3 – 2028 Construction Year Projected Background Traffic

Road	Average Daily Traffic	Peak Hour Traffic		Percent Trucks
US-730		AM	PM	(Assumed)
US-730 just north of I-84	4572	457	457	3
Bombing Range Road				
Directly south of Intersection with US-730	2238	224	224	3
I-84				
Eastbound I-84 on ramp from Bombing Range Road	722	72	72	3
OR-207				
South of Grieb Lane	1077	108	108	3
North of Lower Sand Hollow Road	1067	107	107	3

For smaller roadways in the vicinity of the project without traffic count data, a value of 100 trips per day were assumed, resulting in 10 peak hour trips for the AM and PM peak hour. This assumption was based on data that is available in the ODOT TransGIS system for similarly sized roads nearby in an equivalent rural setting.

3.0 PROJECT TRAFFIC GENERATION

3.1 CONSTRUCTION

Analysis was performed for LOS during construction peak for the three intersections previously described as having adequate traffic count data. This analysis was used to demonstrate the worst-case LOS that the combination of existing and Project traffic would experience during the construction cycle of the Project. The peak number of construction workers and truck deliveries is conservatively assumed to occur during 2028.

Estimates for peak of Project construction traffic are shown in **Table 4**. Values are not available in the Institute of Transportation Engineers Trip Generation Manual for solar projects; however, the values can be projected with reasonable accuracy based on PGR's and Tetra Tech's experience with constructing and operating solar projects. Some portion of workers for large projects are likely to carpool. This rate varies based on several factors including distance from the project site to the nearest town or city, price of fuel, route traveled, and availability of on-site parking. Due to the high likelihood that workers will have to travel a large distance to and from the project site, and considering the types of available temporary accommodation, a carpool factor of 1.5 persons per vehicle was used. It anticipated that the maximum construction workforce would include 950 workers. Trips generated by trucks delivering materials to the site are unlikely to occur during the peak hour, so these were not included in the peak hour traffic generation estimate.

Table 4 – Construction Trip Generation

	Daily		Trip Generation			
			AM Peak Hour		PM Peak Hour	
	Round Trips	ADT*	in	out	in	out
Workers	633	1266	633	0	0	633
Trucks	125	250	0	0	0	0

* *The ADT value counts each worker trip, i.e., one inbound and one outbound for two trips a day.*

3.2 OPERATIONS

Once all of the construction phases have been completed, the solar facility transitions into the operation phase, at which point traffic consists of commuter trips with occasional delivery of routine supplies. Approximately 42 full time employees and seasonal vegetation maintenance workers are expected to be working on site. While it is likely the seasonal vegetation management will not take place frequently, this study has conservatively assumed that all 42 employees will be commuting to and from the site on a daily basis.

Operational life expectancy for the solar project is approximately 30 years. Following the conclusion of the operation phase of the Project, the site will be decommissioned. Decommissioning traffic was not estimated or analyzed as part of the TIA. It is assumed that some level of analysis will be required at that time; however, traffic volume associated with decommissioning is expected to be less than or similar to traffic volume associated with peak construction, so it is likely not to be much different than analyzed peak construction conditions.

3.3 TRIP DISTRIBUTION

Workers for the Project will likely originate from 3 main routes, from the north via either Bombing Range Road, from the north via OR-207, or from the south via OR-207. Based on the distribution of possible temporary

accommodations, the peak traffic numbers were divided up into 37% using Bombing Range Road, 33% using OR-207 from the north, and 30% using OR-207 from the south. This division is reflected in the distribution of peak hour trips used for LOS analysis.

For the Bombing Range Road and US-730 intersection, 37% of the peak hour traffic is assumed to turn left on to Bombing Range Road during the AM Peak Hour. For the PM Peak Hour, 37% of the peak hour construction traffic was assumed to turn right from Bombing Range Road on to US-730.

For the OR-207 intersection at Lower Sand Hollow Road, 33% of the AM peak hour construction traffic was assumed to approach from the north and turn left on to Lower Sand Hollow Road. To be conservative, the 30% vehicles traveling from the south via OR-207 were assumed to turn right on to Lower Sand Hollow Road for the AM peak hour as well. For the PM peak hour, 37% were assumed to turn right on to OR-207 from Lower Sand Hollow Road, and 30% were assumed to turn left on to OR-207. This is unlikely to occur however and is a worst case scenario. Most likely, some traffic from both the south and north will go to Grieb Lane instead, as it reaches a much larger portion of the project site and additional project driveways.

For the OR-207 intersection at Grieb Road, 33% of the AM peak hour construction traffic was assumed to approach from the north and turn right on to Grieb Road. To be conservative, the 30% of vehicles traveling from the south via OR-207 were assumed to turn left on to Grieb Road for the AM peak hour as well. For the PM peak hour, 37% were assumed to turn left on to OR-207 from Grieb Road, and 30% were assumed to turn right on to OR-207.

Additional intersections in the study area do not have sufficient traffic count data to provide substantive analysis of the behavior of traffic. The three intersections being studied for LOS are likely to have similar results to what those intersections may experience and should provide insight into the traffic conditions induced in the area due to the addition of peak hour trips generated by construction traffic.

4.0 PROJECT IMPACTS

4.1 PEAK HOUR LEVEL OF SERVICE

LOS of an intersection is defined by the worst-case delay experienced by any movement group at the intersection. **Table 5** shows the delay and LOS of the worst performing movement group for the Project intersections. For delay and LOS of each movement see **Appendix A**. The Project analysis was performed to analyze traffic conditions with the current infrastructure intersection geometry. For this analysis, the LOS was analyzed based on existing traffic conditions and compared to the conditions that would exist during peak construction traffic. To be conservative, construction peak hour (commuting traffic) was added to the existing peak hour traffic. It is possible, particularly for the evening peak hour, that construction traffic will occur after the background peak hour due to the long days frequently occurring in construction.

Table 5 – Level of Service

Intersection and Movement	Existing Delay (seconds)	Existing LOS	Construction Delay (seconds)	Construction LOS
Study Intersection 1: Bombing Range Road and US-730 AM Peak Hour				
Bombing Range Road	10.0	B	12.9	B
US-730	1.7	A	6.0	A
Study Intersection 1: Bombing Range Road and US-730 PM Peak Hour				
Bombing Range Road	10.0	B	12.0	B
US-730	1.7	A	1.7	A
Study Intersection 2: OR-207 and Lower Sand Hollow Road AM Peak Hour				
OR-207	0.3	A	7.0	A
Lower Sand Hollow Rd	7.7	A	9.9	A
Study Intersection 2: OR-207 and Lower Sand Hollow Road PM Peak Hour				
OR-207	0.3	A	0.3	A
Lower Sand Hollow Rd	7.7	A	9.0	A
Study Intersection 3: OR-207 and Grieb Lane AM Peak Hour				
OR-207	0.4	A	6.9	A
Grieb Lane	8.9	A	12.7	B
Study Intersection 3: OR-207 and Grieb Lane PM Peak Hour				
OR-207	0.4	A	0.4	A
Grieb Lane	8.9	A	12.3	B

The impacts at both the Bombing Range Road at US-730 and OR-207 at Lower Sand Hollow Road were found to be small, and unlikely to have a significant impact on traffic flow and speed. The LOS for existing traffic compared to the construction traffic remained unchanged due to only minor delay time changes.

The OR-207 and Grieb Lane intersection operates at a LOS of A under existing conditions, but this would drop to LOS B for Grieb Lane with the addition of peak construction traffic. However, the totally delay increase is less than 5 seconds. This is a minor impact and would largely only effect the construction traffic due to the small number of existing road users.

Because the LOS changes are minor, with a maximum delay increase of 6.7 seconds, the construction traffic is unlikely to cause a significant impact on traffic flow with regards to LOS. It should be noted that increasing the number of vehicles on a roadway that need to stop and make left turns increases the risk of rear-end collisions. This can be mitigated by posting appropriate warning signage to notify road users of the construction area and also by reducing speeds.

5.0 CONCLUSION

The development of the Project will cause minor increases in delay time and LOS at the intersections studied in the project haul route, but overall those were found to be in an acceptable range. This analysis result would be reasonable to assume for the other intersections within the project vicinity. All remaining intersections that were described but not studied do not have sufficient traffic count data to perform a LOS analysis. However, as the intersections are rural in nature and the highest traffic intersections have been studied, it is unlikely that the road user experience at the unstudied intersections will be significantly impacted by the addition of construction traffic.

If appropriate caution is taken to mitigate road safety concerns by using appropriate signage and traffic control measures, the Project's construction phases should have only minor impacts on the local roads around the project, in the form of small increases in delay time. Once operational, the traffic generated by the Project is negligible. Based on this TIA, it does not appear detailed study of any additional intersections, further types of traffic impact analysis, or impact mitigation is warranted.

6.0 REFERENCES

Morrow County. 2017. *Morrow County Zoning Ordinance Article 6*. Available online at: https://www.co.morrow.or.us/sites/default/files/fileattachments/ordinance/13021/zoning_article_6_08012017.pdf. Accessed November 27, 2023.

NAS (National Academies of Science, Engineering, and Medicine). 2022. *Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis*. Washington, D.C.

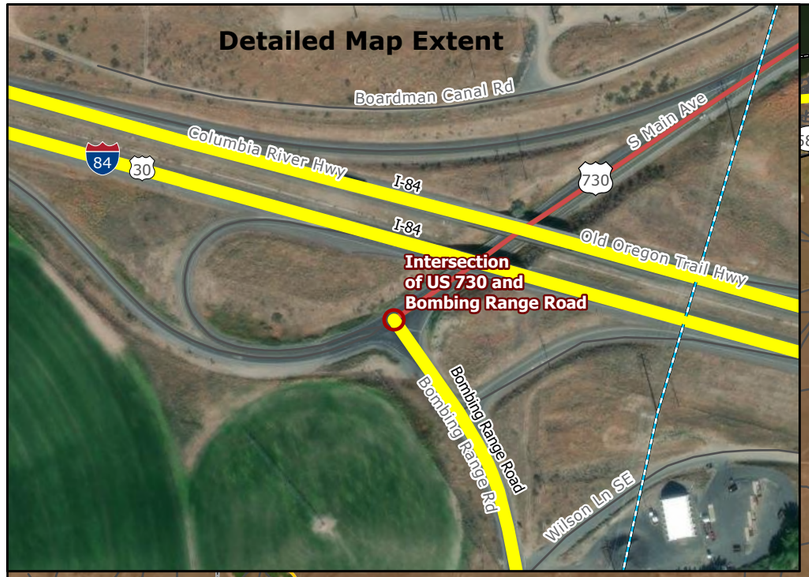
ODOT. 2023. *ODOT TransGIS*. Available online at: https://gis.odot.state.or.us/transgis/. Accessed November 29, 2023

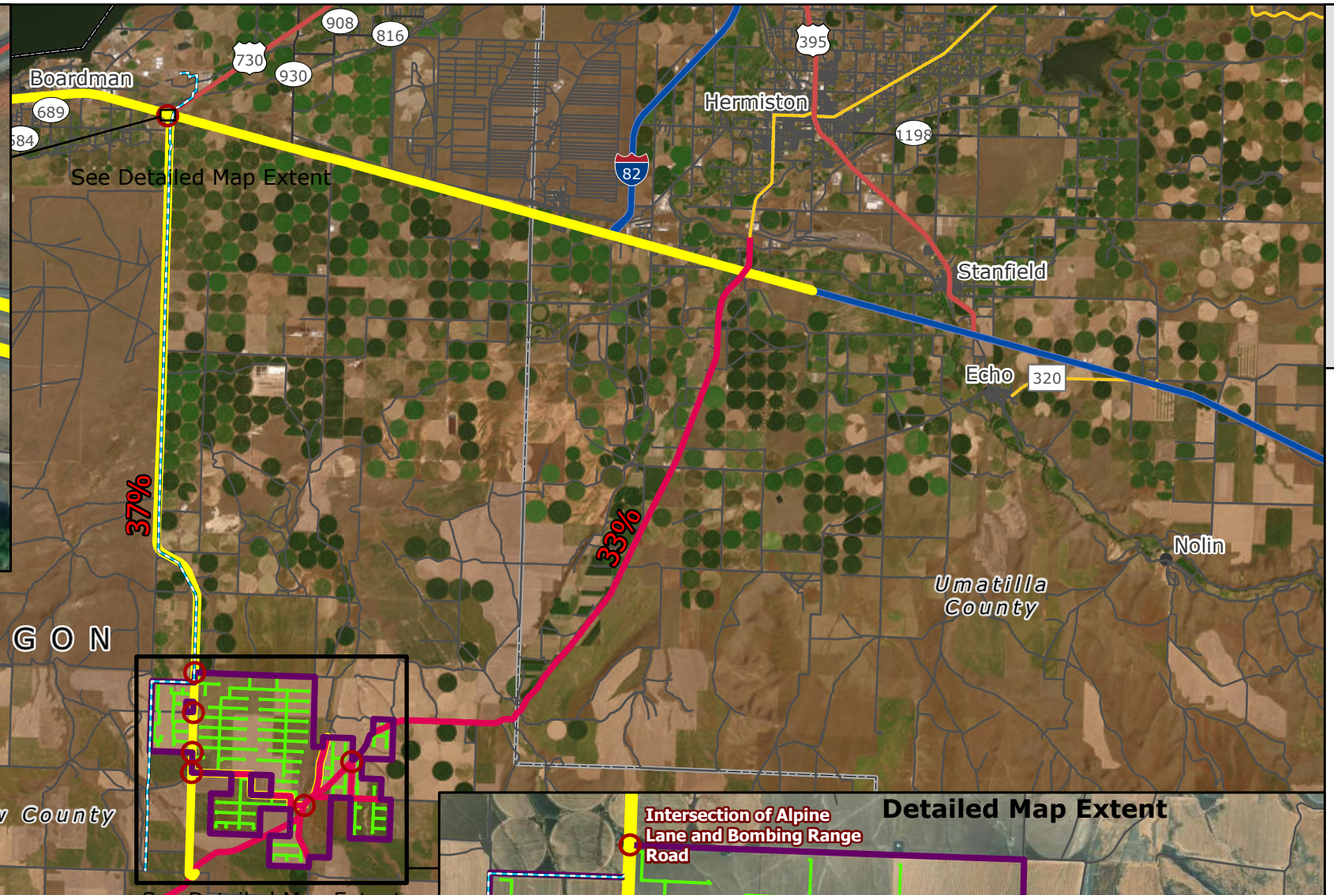
FIGURE 1: TRANSPORTATION ROUTE MAP AND INTERSECTION LOCATIONS

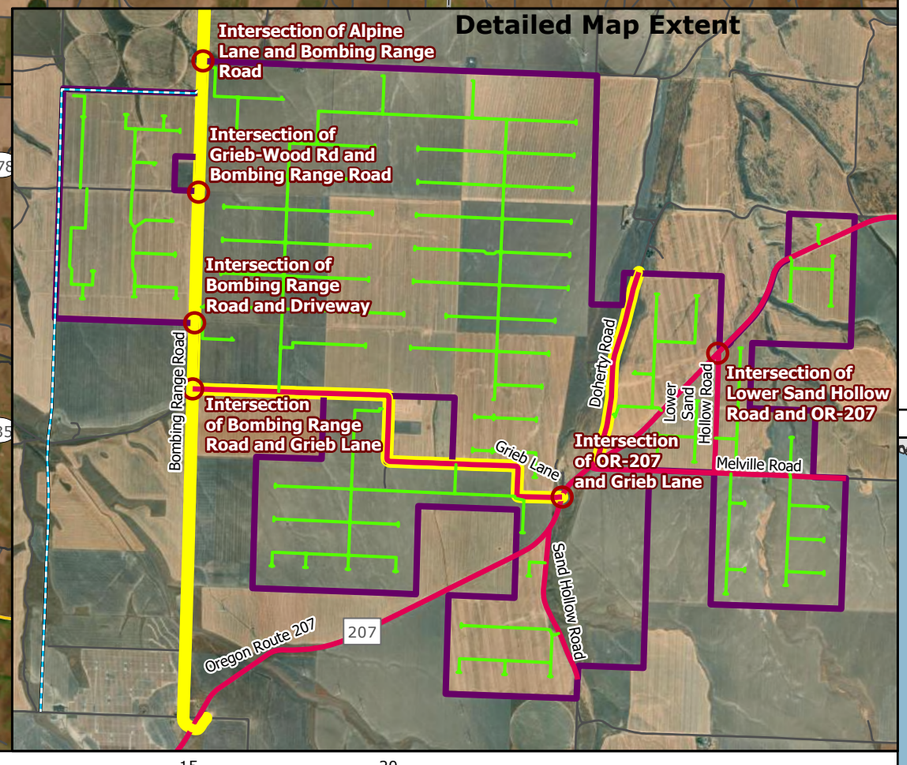
Sunstone Solar Project

Figure 1 Transportation Route Map with Intersection Locations

MORROW COUNTY, OR







- Site Boundary
- Intersection Location
- Primary Transportation Route*
- Alternate Transportation Route*
- Project Access Road
- City/Town
- County Boundary
- State Boundary
- Interstate Highway
- US Highway
- State Highway
- County Highway
- Local Roads
- Existing UEC Transmission Line

*Percentage of construction traffic using Transportation Route

TETRA TECH PINEGATE RENEWABLES

Reference Map

1:240,000 WGS 1984 UTM Zone 11N 0 2.5 5 10 15 20 Miles

NOT FOR CONSTRUCTION

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APPENDIX A: LOS CALCULATION SHEETS

HCS Two-Way Stop-Control Report

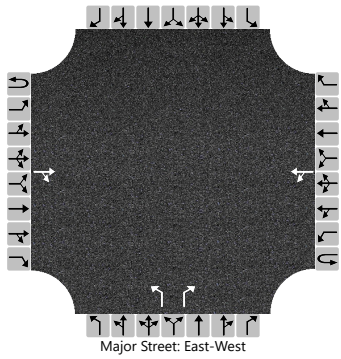
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Existing Conditions
Intersection Orientation	East-West
Project Description	Sunstone Solar Project

Site Information

Intersection	Bombing Range Road at US-730
Jurisdiction	Morrow County
East/West Street	US-730/I-84 on ramp
North/South Street	Bombing Range Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			149	72		40	180			49		80				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage			Left + Thru							9						

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						43				53		87				
Capacity, c (veh/h)						1321				728		837				
v/c Ratio						0.03				0.07		0.10				
95% Queue Length, Q_{95} (veh)						0.1				0.2		0.3				
Control Delay (s/veh)						7.8	0.3			10.3		9.8				
Level of Service (LOS)						A	A			B		A				
Approach Delay (s/veh)						1.7				10.0						
Approach LOS						A				B						

HCS Two-Way Stop-Control Report

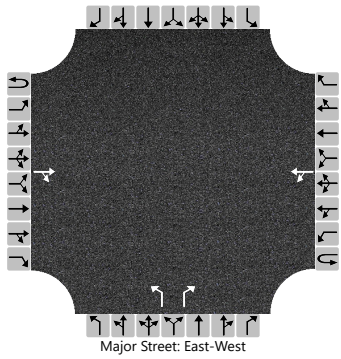
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Peak Construction - AM
Intersection Orientation	East-West
Project Description	Sunstone Solar Project

Site Information

Intersection	Bombing Range Road at US-730
Jurisdiction	Morrow County
East/West Street	US-730/I-84 on ramp
North/South Street	Bombing Range Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			149	72		274	180			49		80				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage			Left + Thru							9						

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						298				53		87				
Capacity, c (veh/h)						1321				330		837				
v/c Ratio						0.23				0.16		0.10				
95% Queue Length, Q_{95} (veh)						0.9				0.6		0.3				
Control Delay (s/veh)						8.5	2.2			18.0		9.8				
Level of Service (LOS)						A	A			C		A				
Approach Delay (s/veh)						6.0				12.9						
Approach LOS						A				B						

HCS Two-Way Stop-Control Report

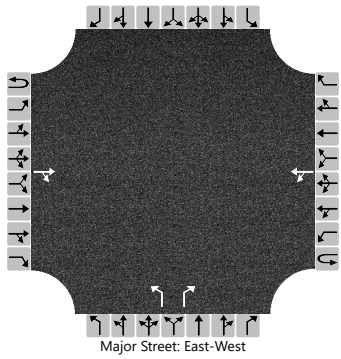
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Peak Construction - PM
Intersection Orientation	East-West
Project Description	Sunstone Solar Project

Site Information

Intersection	Bombing Range Road at US-730
Jurisdiction	Morrow County
East/West Street	US-730/I-84 on ramp
North/South Street	Bombing Range Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			149	72		40	180			49		314				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage						Left + Thru						9				

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						43				53		341				
Capacity, c (veh/h)						1321				728		837				
v/c Ratio						0.03				0.07		0.41				
95% Queue Length, Q_{95} (veh)						0.1				0.2		2.0				
Control Delay (s/veh)						7.8	0.3			10.3		12.2				
Level of Service (LOS)						A	A			B		B				
Approach Delay (s/veh)						1.7				12.0						
Approach LOS						A				B						

HCS Two-Way Stop-Control Report

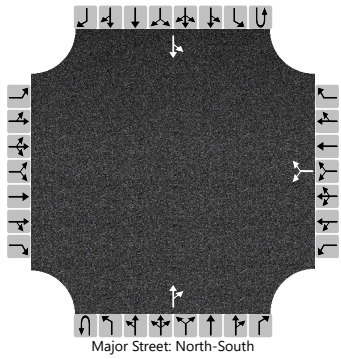
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Existing Conditions
Intersection Orientation	North-South
Project Description	Sunstone Solar Project

Site Information

Intersection	OR-207 at Lower Sand Hollow Rd
Jurisdiction	Morrow County
East/West Street	Lower Sand Hollow Rd
North/South Street	OR-207
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						2		3			51	3		2	52	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.43		6.23						4.13		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							5							2		
Capacity, c (veh/h)							1331							1539		
v/c Ratio							0.00							0.00		
95% Queue Length, Q_{95} (veh)							0.0							0.0		
Control Delay (s/veh)							7.7							7.3	0.0	
Level of Service (LOS)							A							A	A	
Approach Delay (s/veh)						7.7								0.3		
Approach LOS						A								A		

HCS Two-Way Stop-Control Report

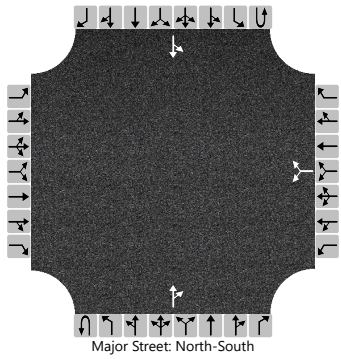
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Peak Construction - AM
Intersection Orientation	North-South
Project Description	Sunstone Solar Project

Site Information

Intersection	OR-207 at Lower Sand Hollow Rd
Jurisdiction	Morrow County
East/West Street	Lower Sand Hollow Rd
North/South Street	OR-207
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						2		3			51	193		211	52	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.43		6.23						4.13		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							5							229		
Capacity, c (veh/h)							738							1293		
v/c Ratio							0.01							0.18		
95% Queue Length, Q_{95} (veh)							0.0							0.6		
Control Delay (s/veh)							9.9							8.4	1.5	
Level of Service (LOS)							A							A	A	
Approach Delay (s/veh)						9.9								7.0		
Approach LOS						A								A		

HCS Two-Way Stop-Control Report

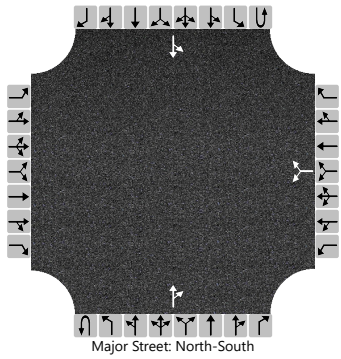
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Peak Construction - PM
Intersection Orientation	North-South
Project Description	Sunstone Solar Project

Site Information

Intersection	OR-207 at Lower Sand Hollow Rd
Jurisdiction	Morrow County
East/West Street	Lower Sand Hollow Rd
North/South Street	OR-207
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						192		212			51	3		2	52	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.43		6.23						4.13		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							439							2		
Capacity, c (veh/h)							1328							1539		
v/c Ratio							0.33							0.00		
95% Queue Length, Q_{95} (veh)							1.5							0.0		
Control Delay (s/veh)							9.0							7.3	0.0	
Level of Service (LOS)							A							A	A	
Approach Delay (s/veh)						9.0								0.3		
Approach LOS						A								A		

HCS Two-Way Stop-Control Report

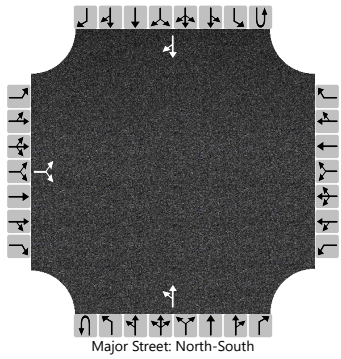
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Existing Conditions
Intersection Orientation	North-South
Project Description	Sunstone Solar Project

Site Information

Intersection	OR-207 at Grieb Lane
Jurisdiction	Morrow County
East/West Street	Grieb
North/South Street	OR-207
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		3		2						3	51				52	2
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			5							3						
Capacity, c (veh/h)			921							1539						
v/c Ratio			0.01							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			8.9							7.3	0.0					
Level of Service (LOS)			A							A	A					
Approach Delay (s/veh)		8.9								0.4						
Approach LOS		A								A						

HCS Two-Way Stop-Control Report

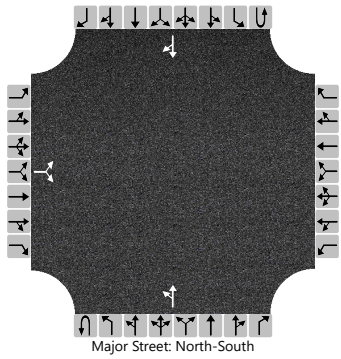
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Peak Construction - AM
Intersection Orientation	North-South
Project Description	Sunstone Solar Project

Site Information

Intersection	OR-207 at Grieb Lane
Jurisdiction	Morrow County
East/West Street	Grieb
North/South Street	OR-207
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		3		2						193	51				52	211
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			5							210						
Capacity, c (veh/h)			471							1271						
v/c Ratio			0.01							0.17						
95% Queue Length, Q_{95} (veh)			0.0							0.6						
Control Delay (s/veh)			12.7							8.4	1.4					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		12.7								6.9						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

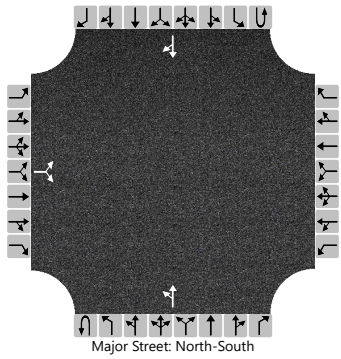
General Information

Analyst	EAJ
Agency/Co.	EFSC
Date Performed	12/1/2023
Analysis Year	2028
Time Analyzed	Peak Construction - PM
Intersection Orientation	North-South
Project Description	Sunstone Solar Project

Site Information

Intersection	OR-207 at Grieb Lane
Jurisdiction	Morrow County
East/West Street	Grieb
North/South Street	OR-207
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		212		192						3	51				52	2
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			439							3						
Capacity, c (veh/h)			931							1539						
v/c Ratio			0.47							0.00						
95% Queue Length, Q_{95} (veh)			2.6							0.0						
Control Delay (s/veh)			12.3							7.3	0.0					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		12.3								0.4						
Approach LOS		B								A						

Attachment U-7. Construction Traffic Management Plan

Draft
Construction Traffic Management Plan

Sunstone Solar Energy Project
Morrow County, Oregon

Prepared for:

Pine Gate Renewables, LLC

Prepared by:

TETRA TECH

December 2023

TABLE OF CONTENTS

FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Purpose and Scope

This Draft Construction Traffic Management Plan (Draft Plan) was prepared to meet the requirements of Morrow County and to be later included in the development of a Road Use Agreement, as described in the Sunstone Solar Energy Project (Project) Exhibit U of the Application for Site Certification (ASC) submitted to the Oregon Energy Facility Siting Council (EFSC).

This Draft Plan, per Oregon Department of Transportation's (ODOT) Traffic Control Plan Manual, is a "living document", and it will continue to grow as the roadway safety needs of the project change over the course of construction. It should be noted that the outline of this document is designed to be comparable with the ODOT Traffic Control Plan Manual's minimum requirements for a TMP, which typically only apply explicitly to significant ODOT highway construction projects. This document will be updated with input from EFSC and agencies identified by EFSC prior to the start of Project construction.

1.2 Project Description

Pine Gate Renewables, LLC (Applicant) proposes to construct and operate the Project. The Project is a solar photovoltaic (PV) generation facility located in north-central Morrow County (County), Oregon. The Project is located south of Interstate 84 (I-84) near Lexington, Oregon, as shown in **Appendix A**.

The following terms are used to describe areas associated with Project development:

- **Project Lease Boundary**: The approximately 10,960-acre area that encompasses assessor parcels that the Applicant has negotiated or is pursuing land access agreements, as required, with the landowners.
- **Project Area:** The approximately 9,442-acre area that includes the solar array area and additional disturbed areas for the construction of transmission lines, substations/ switchyards, a battery energy storage system (BESS), and other project components.

1.3 Contact Information

1.3.1 Applicant

Name/Contact:

Pine Gate Renewables, LLC
c/o Logan Stephens

Mailing address:

Pine Gate Renewables, LLC
130 Roberts Street,
Asheville, NC 28801

Phone: (336) 708-5161

Email: loganstephens@pgrenewables.com

1.3.2 Preparer

Name/Contact:
Tetra Tech, Inc.
c/o Linnea Fossum

Mailing address:
1750 S Harbor Way, Suite 400
Portland, OR 97201

Phone: 503-727-8062

Email: linnea.fossum@tetratech.com

2.0 TRAFFIC CONTROL AND MANAGEMENT

2.1 Traffic Control Criteria

Project construction traffic will primarily include the delivery of construction equipment, vehicles and materials, and daily construction worker trips. The vast majority of the equipment (e.g., solar modules, inverters, tracker steel, transmission poles, substation circuit breakers, and substation steel) will be delivered to the Project in standard widths and lengths by trucks, vans, and covered flatbed trailers. Substation equipment, inverter enclosures, and cranes will be delivered to the Project site on oversize vehicles.

This Draft Plan was developed to address the County's applicable traffic control mitigation needs. Morrow County requires that traffic control devices used on county roads follow the Manual on Uniform Traffic Control Devices (MUTCD) published and updated by the Federal Highway Administration. In additional, all ODOT-maintained roads are also required to follow this standard for the use and placement of traffic control devices.

Some safety concerns were raised by the county with regards to construction related traffic making frequent stops in the road to make left turns onto project driveways. Specifically, poor weather that occurs frequently in the region causing low-visibility conditions could make the risk of rear-end collisions higher for those vehicles making left turns and any vehicles following them. Specific measures to mitigate this concern are outlined in this TMP. In addition, traffic control measures for the construction of entrance driveways along roads are discussed.

2.2 Traffic Control Measures

There are a few major roads that will be used by project traffic. These include OR-207, Bombing Range Road, and Grieb Lane. In addition, some smaller county roads will be used for specific project access driveways. These include Lower Sand Hollow Road, Grieb-Wood Road, and Alpine Lane.

Typical construction operations, such as the construction of driveways, can be managed using shoulder closures and flagger controlled single lane closures along the route and near access points. For better warning and management of slow, left-turning construction traffic, portable changeable message signs can be used. This can provide advanced warning to motorists that construction traffic is in the area, and to slow down, watch for stopped cars, and take caution in inclement weather.

2.3 Traffic Control Devices and Personnel

Temporary signage, lighting, and traffic control devices will be installed on OR-207, Bombing Range Road, and Grieb Lane, as well as throughout the minor roads and Project area. Signage may include but is not limited to appropriate signage and portable changeable message signs along access routes to indicate the presence of heavy vehicles and construction traffic.

The construction signage shall consist of standard warning signs as shown in **Figures 1** through **3**. The drawings depict the minimum construction sign layout recommended for safety and to caution motorists to the presence of construction traffic in the area. Additional signs could be used in addition to the signs specified, such as "TO BE CLOSED (insert dates)," "NO CELL PHONE USE WHILE IN VEHICLE," or "SLOW DOWN." This plan does not include consideration of non-transportation related construction signage such as hard hat area signs, etc.

Use of flaggers for traffic signalization on a daily basis is not anticipated as road and right-of-way work will be minimized to avoid changes in traffic patterns. The commuting hour construction traffic may experience slowdowns near the Project site since they are going to the same location. However, the Project site is very rural and existing traffic is below the road capacity; thus, there is no need for temporary flagging to improve operations during the commuting hour. Flaggers will be used only when necessary, on a temporary basis such as a lane or full road closure.

2.4 Managing and Directing Traffic

The following measures are proposed for managing traffic during construction:

- Prior to commencement of construction, and as directed by EFSC, the Applicant will seek input on this Draft Plan from the Oregon Department of Transportation (ODOT) and Morrow County.
- A haul route plan will be developed and incorporated in this Plan once vendors have been selected and construction schedule developed. This haul route plan will confirm source locations and routes to be used during Project construction as well as anticipated loads and haul schedule.
- Detour plans and warning signage will be provided in advance of planned traffic disturbances.
- Ingress and egress points to the Project site will be located and improved (if needed) to meet adequate capacity for existing and projected traffic volumes and to provide efficient movement of traffic, including existing and anticipated agricultural traffic.
- The Applicant will obtain necessary ODOT permits to transport regulated loads on State-managed roadways, such as trip permits for oversize and overweight loads.
- The Applicant or its contractor and EFSC staff will meet prior to final site plan approval to outline steps for minimizing construction traffic impacts, including conflicts if State-imposed roadway restrictions could affect transporter routes.
- The Applicant or its contractor will provide advance notification to adjacent landowners and farmers through mailing, informal meeting, open house or other similar methods, when construction takes place in the vicinity of their homes and farms to help minimize access disruptions. The Applicant or its contractor will specify timing of deliveries of heavy equipment and building materials to the extent feasible.

- Construction vehicles will yield to school-related vehicles (e.g., school buses) and will lower their speed when approaching a school bus or bus stop along the transportation route.
- Advanced warning and proper roadway signage will be placed on OR-207, Bombing Range Road, and Grieb Lane to warn motorists of potential Project-related vehicles entering and exiting the roadway. Access to adjacent property will be maintained during Project construction.
- When slow or oversized wide loads are being hauled, appropriate vehicle and roadside signing and warning devices will be deployed. Pilot cars will be used as ODOT dictates, depending on load size and weight.
- Carpooling among the construction workers will be encouraged to reduce traffic volume to and from the Project site.
- The Project will use appropriate signage where needed to direct the public from entering restricted areas. During construction, temporary barriers and traffic control measures will be used where applicable.
- Flaggers will be employed as necessary to direct traffic when large equipment is exiting or entering OR-207, Bombing Range Road, or Grieb Lane to minimize risk of accidents. Should the Applicant or its construction contractor receive notice during Project construction of transportation events (e.g., ODOT or Morrow County transportation projects, roadway incident, other traffic events) that give rise to a safety concern, the Project construction manager will review this Plan in coordination with the applicable agency and address additional safety measures, including flagging, as may be appropriate for the situation.
- If lane closures must occur, adequate signage for potential detours or possible delays will be posted.
- Advance notification will be provided to emergency providers and hospitals when public roads may be partially or completely closed.
- Emergency vehicles will be given the right-of-way as required by local, state, and federal requirements. If traffic accidents occur on-site or by site personnel entering or leaving the Project site, the appropriate emergency services shall be notified. Incidents that occur on-site warrant an evaluation of what happened and what, if any, additional safety signs or protocols should be in place to prevent incidents.
- Traffic control requests will be coordinated through the ODOT traffic engineer and Morrow County Public Works, abiding by seasonal County road restrictions.
- The Applicant or contractor will monitor the roads within and adjacent to the Project for stray material inadvertently dropped or dispersed on the existing roads. If discovered, the contractor will remove the material as soon as possible.
- The Applicant or contractor will be responsible for damage to County roads directly caused by the Project. The road(s) will be repaired consistent with terms of a Road Use Agreement with the County.

2.5 Coordination with Agencies

The Applicant or contractor will be responsible for coordinating shoulder, lane or road closures with the various agencies. Local law enforcement will be contacted and informed of traffic control measures being implemented along the Project transportation routes.

2.6 ODOT Traffic Control Plan Examples

Example ODOT traffic control plans are shown on **Figures 1 through 3**. Project-specific traffic control plans will be developed as part of the construction package (see **Appendix D** [*Intentionally left blank, final Traffic Control Plans to be included, if needed*]).

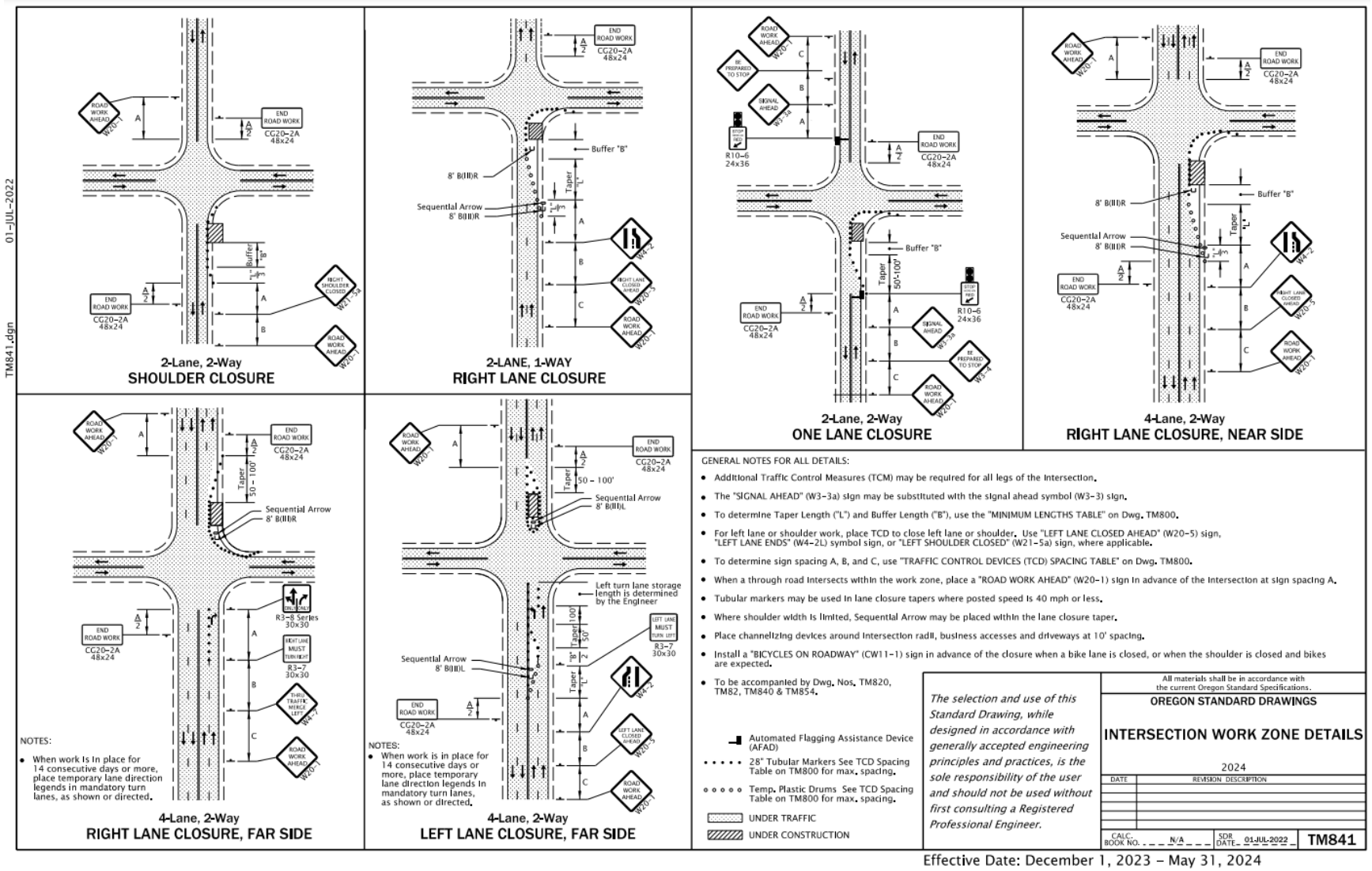


Figure 1. Example ODOT Traffic Control Plan Detail. Intersection Work Zone Details.

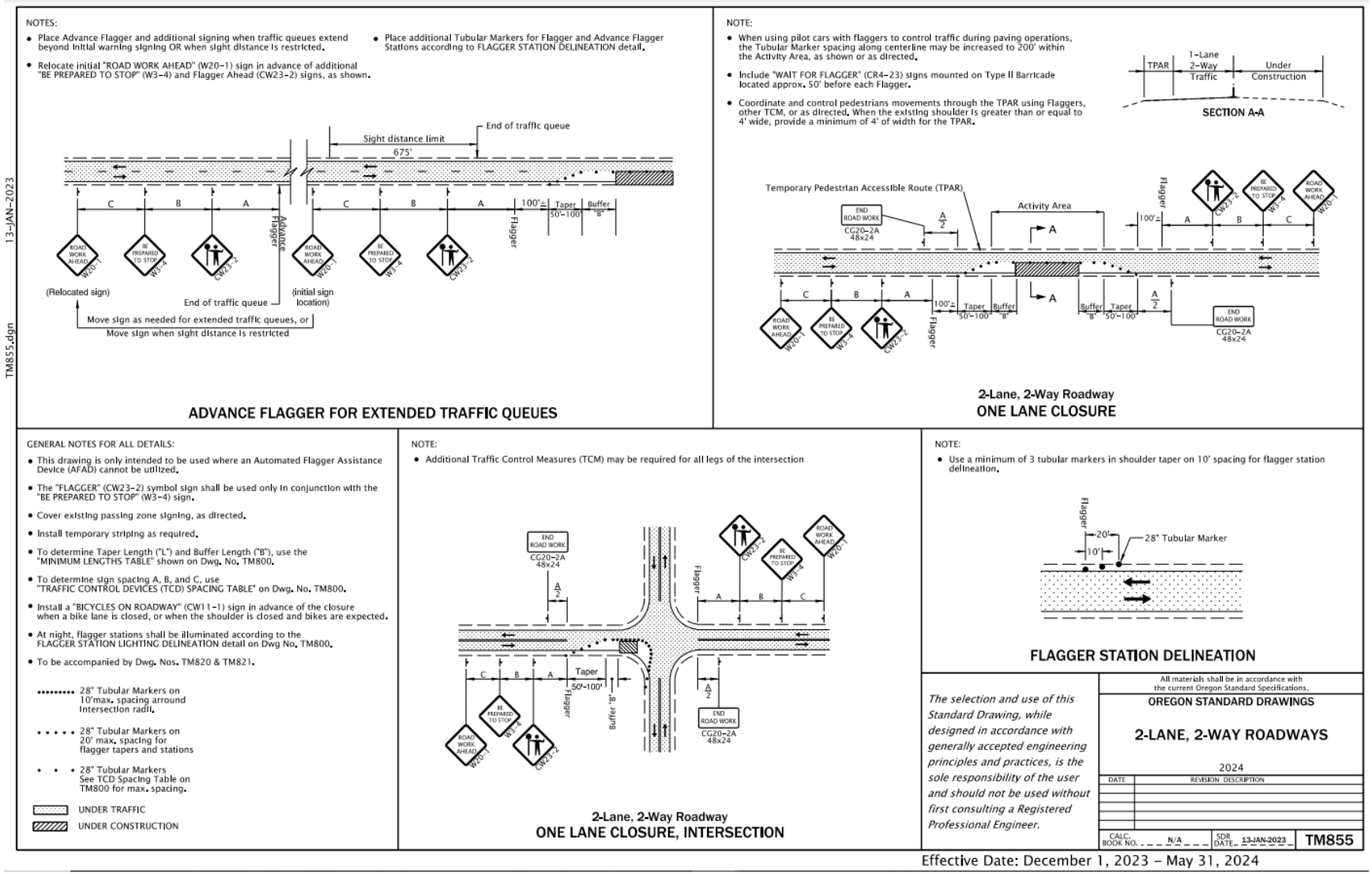


Figure 2. Example ODOT Traffic Control Plan Detail. 2-Lane, 2-Way Roadways – Flaggers.

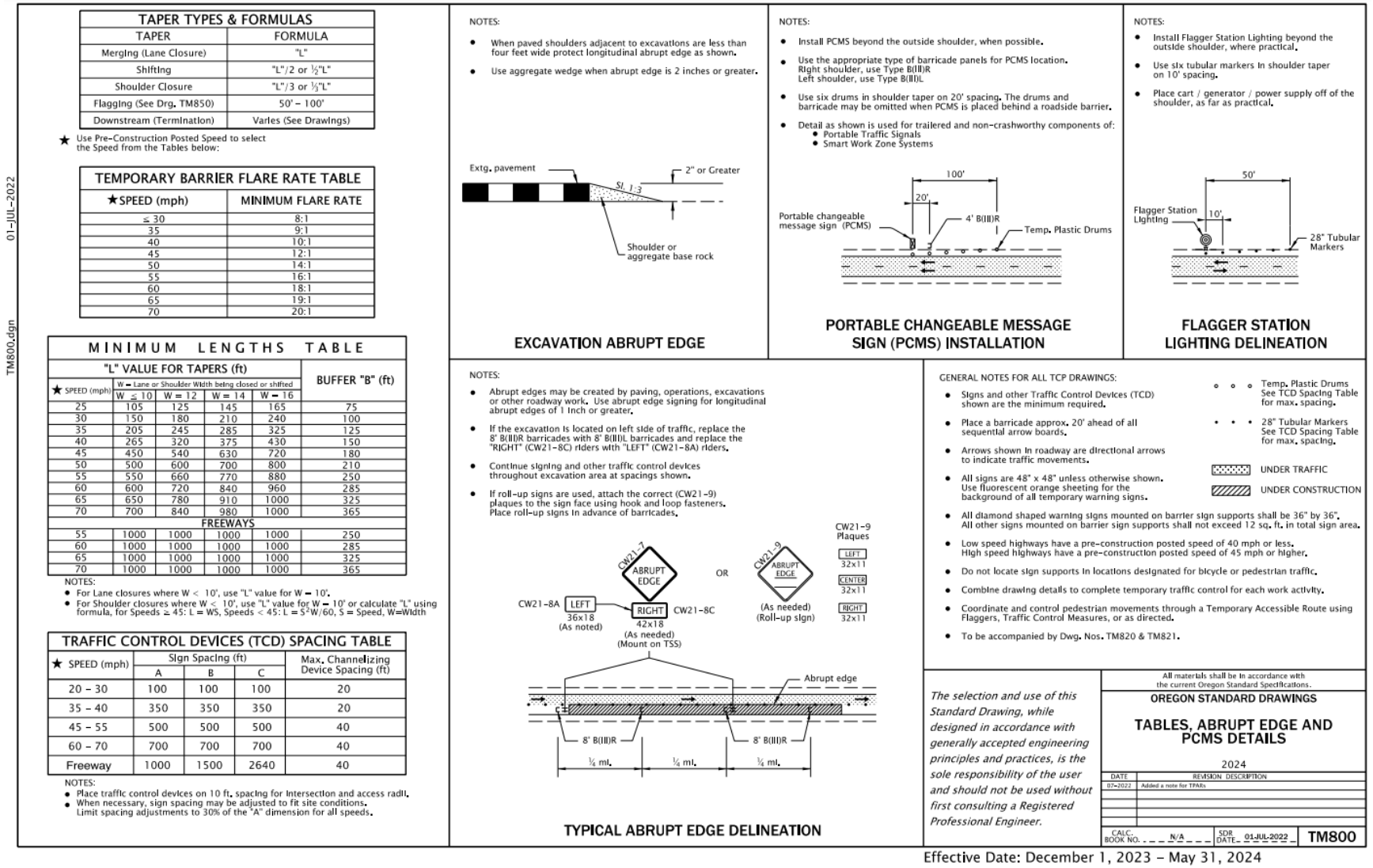


Figure 3. Example ODOT Traffic Control Plan. Tables, Abrupt Edge and PCMS Details.

3.0 COMMUNICATION AND COORDINATION

Updates to the Plan may be required to accommodate changes in the methods of construction, exceptional circumstances (e.g., interconnection to power outside of Project limits), safety, or other concerns. This Plan is not intended to be final. It is rather a starting point to understand Project construction and safety considerations. It is the responsibility of the Construction Manager or designated on-site safety personnel to address traffic concerns should they arise. This Plan may be updated in coordination with EFSC and Morrow County.

3.1 Communication Plan

The various tools described below provided a mechanism for the Applicant to communicate updates to the public and local stakeholders.

3.1.1 Media Outreach

The Applicant maintains a distribution list of local, regional, and statewide media outlets. Media outreach, including formal press releases and informal coordination with reporters, may be used to inform the public of Project construction activities.

3.1.2 Stakeholder Distribution List

The Applicant maintains a contact list for interested stakeholder groups, including but not limited to business leaders and/or representatives from regional chambers of commerce; elected officials for cities and counties in the region; public utility districts; fire district representatives; and school district representatives. The stakeholder distribution list may be used to inform stakeholders of Project construction activities.

3.2 Law Enforcement, Emergency Services, and other Agencies

3.2.1 Oregon State Patrol

Permits for oversized deliveries of equipment will be coordinated with the Oregon State Patrol as needed by the contractor.

3.2.2 Oregon Department of Transportation

Permits, designs, and coordination for working in the right-of-way and/or improvements to existing roads or intersections will be provided separately to ODOT by the contractor as necessary during Project construction.

3.2.1 Morrow County Public Works

Permits, designs, and coordination for working in the right-of-way and/or improvements to existing roads or intersections will be provided separately to Morrow County Public Works by the contractor as necessary during Project construction.

3.2.2 Private Landowners

If unforeseen circumstances require temporarily limiting access to an adjacent property, the Applicant or Contractor will notify the landowner ahead of time and ensure that the work is done as quickly as possible.

3.2.3 Emergency Services

If traffic accidents occur on site, or by site personnel entering or leaving the site the appropriate emergency services shall be notified. Emergency services will always be able to access the site.

No changes to infrastructure are anticipated that would impede access at any time during Project construction. Incidents that occur on-site warrant an evaluation of what happened and what, if any, additional safety signs or protocols should be in place to prevent incidents.

3.3 Public Outreach

The Applicant will address complaints and concerns with the public either individually with the complainant or via one or more of the outlets described in the Communication Plan, Section 3.1

4.0 CONCLUSION

State and Morrow County roads may be temporarily affected by construction-related traffic. Truck traffic carrying materials and supplies to the Project site would generally not coincide with morning and evening peak hours; rather, truck traffic would be dispersed throughout the working day. Private vehicle traffic would generally occur out of phase with the truck traffic, as the workers report earlier and leave later than most of the truck traffic. Given the early start times (7 a.m.) and late finish times (7 p.m.) common to solar farm construction, worker commuting traffic likely would overlap with peak traffic hours. Properly implemented traffic controls will minimize the impact to the community and commuting traffic. Portable changeable message signs as well as the Flagger-controlled lane and shoulder closures discussed in Section 2.3 will, if needed, minimize potential traffic disruptions and safety concerns while maintaining the flow of truck traffic.

APPENDIX A

PRELIMINARY SITE LAYOUT AND TRANSPORTATION ROUTES

[FINAL SITE LAYOUT AND TRANSPORTATION ROUTES TO BE INCLUDED HERE]

Sunstone Solar Project

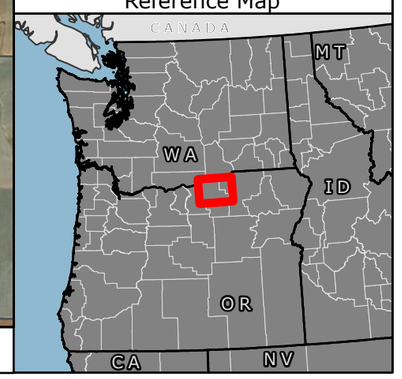
Figure U-2
Primary and Alternate Construction Transportation Routes

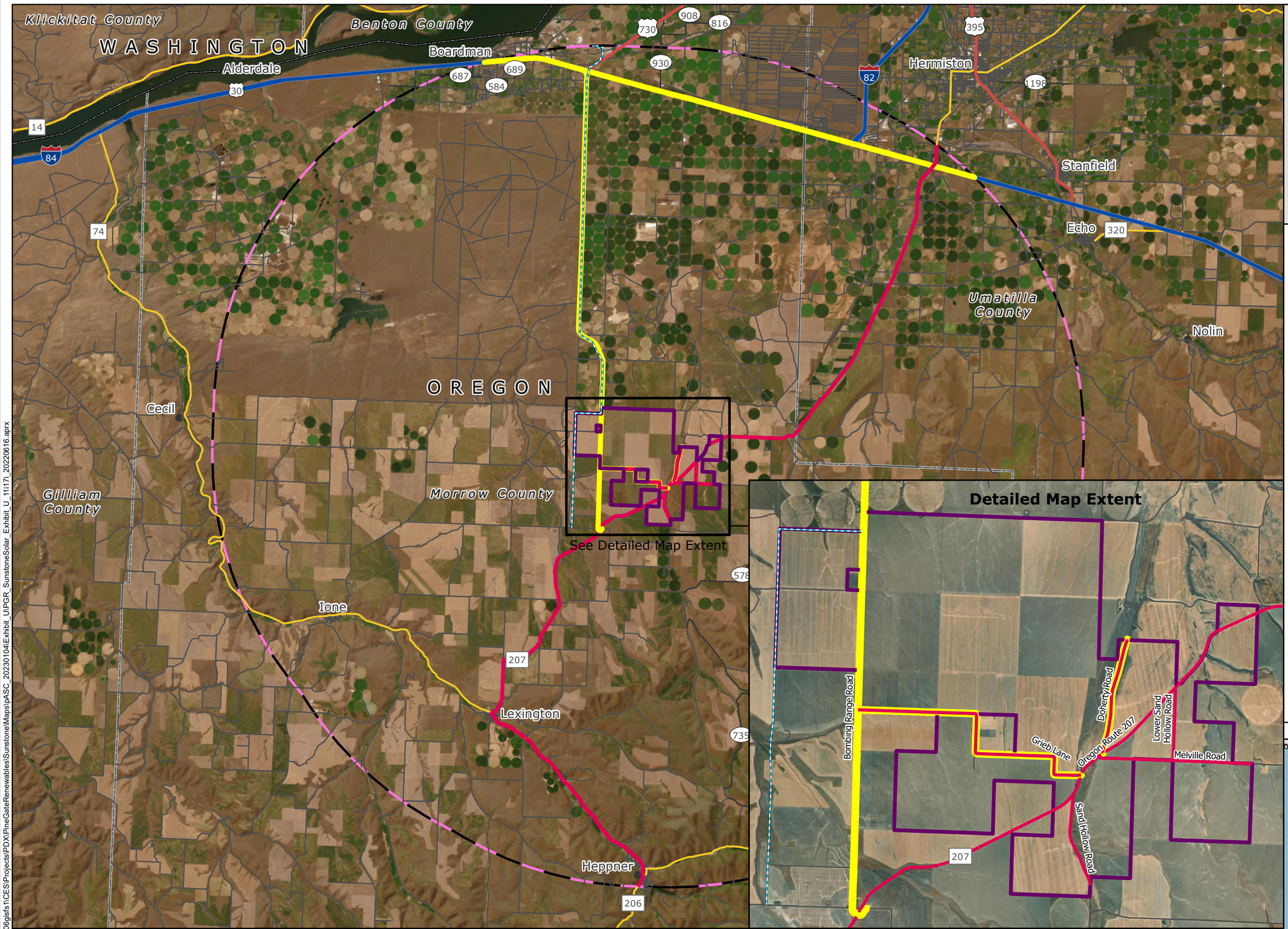
MORROW COUNTY, OR

- Site Boundary
- Analysis Area (15-mile Buffer)
- Primary Transportation Route
- Alternate Transportation Route
- City/Town
- County Boundary
- State Boundary
- Interstate Highway
- US Highway
- State Highway
- County Highway
- Local Roads
- Existing UEC Transmission Line

TETRA TECH PINEGATE RENEWABLES

Reference Map





1:240,000 WGS 1984 UTM Zone 11N

0 2.5 5 10 15 20 Miles

NOT FOR CONSTRUCTION

\\Cess706gisfs1\CES\Projects\PDX\PineGateRenewables\SunstoneMaps\pASC_20230104\Exhibit_U\PGR_SunstoneSolar_Exhibit_U_11i17i_20220616.aprx

APPENDIX B

DETOUR PLAN

[FINAL DETOUR PLAN TO BE INCLUDED HERE, IF NEEDED]

APPENDIX C

HAUL ROUTE PLAN

[FINAL HAUL ROUTE PLAN TO BE INCLUDED HERE, IF NEEDED]

APPENDIX D

TRAFFIC CONTROL PLAN DRAWINGS

[FINAL TRAFFIC CONTROL PLAN DRAWINGS TO BE INCLUDED HERE, IF NEEDED]

Attachment U-8. Draft Road Use Agreement

DRAFT ROAD USE AND MAINTENANCE AGREEMENT

THIS ROAD USE AND MAINTENANCE AGREEMENT ("**Agreement**") is entered into at the date and time when the agreement has been signed by all parties as reflected in the signature blocks below. ("**Effective Date**") by and between Morrow County, whose address for purposes of this Agreement is 100 S. Court St., Heppner, Oregon, 97836 ("**County**") and Sunstone Solar, LLC ("**Developer**").

RECITALS

WHEREAS, Developer is developing a solar photovoltaic energy generation facility ("**Project**") on sites located in Morrow County, Oregon, as described in **Exhibit A**, (Overall map including structures, transmission lines, haul routes, access permits, utility permits, O&M buildings and etc.) with approximately xxx structures and an expected total nameplate capacity of approximately 1,250 megawatts ("**MW**"); and

WHEREAS, Developer intends to obtain the necessary approvals to build, operate and maintain the Project; and

WHEREAS, in connection with the construction, operation and maintenance of the Project, the Parties desire to address certain issues relating to the roads owned, operated and maintained by the County and as shown on **Exhibit B** (Map to include all structures, transmission lines, delivery routes, construction routes and other roads used during construction of projects) attached hereto (collectively, the "**Roads**"), over which it will be necessary for Developer and Developer's Representative(s) to, among other things: (i) transport heavy equipment and materials which may be in excess of local design limits of certain Roads, (ii) transport locally sourced materials, such as concrete and gravel, on the Roads; (iii) make specific modifications and improvements (both temporary and permanent) to the Roads (including various associated culverts, bridges, cattle guards, road shoulders and other fixtures) to permit such equipment and materials to pass; and (iv) place overhead and underground electrical and communication cables (collectively "**Cables**") for the Project adjacent to, along, under or across such Roads; and

WHEREAS, Developer and the County wish to set forth their understanding and agreement relating to the use of Roads during the construction of the Project; and

NOW, THEREFORE, in consideration of the mutual terms and conditions set forth in this Agreement, and for other good and valuable consideration, receipt of which is hereby acknowledged, the Parties agree as follows:

TERMS AND CONDITIONS

1. Developer will undertake the following activities in accordance with the terms of this Agreement during the period in which it is constructing the Project (the "Construction Period"). For the avoidance of doubt, the Construction Period will begin only once Developer has initiated material infield earthworks for the construction of the Project under a signed engineering, procurement, and construction agreement. The Construction Period shall not be triggered by (i)

Developer's due diligence activities on the Project's site (including, without limitation, geotechnical boring, preliminary studies, field tiling surveys, plans, entitlement-related studies, push-pull tests, and other site assessments, surveys, environmental assessments, reports, or test results) or (ii) any work performed by or on behalf of the servicing utility company.

a. Designate a company representative with authority to represent Developer. At any time the Developer Designee is changed, Developer shall notify County within 24 hours, informing County of new Designee name, physical and mailing addresses, email address, and contact phone number. As of the date of the Agreement, the company representative is xxxxxxx;

b. At least ninety (90) days prior to beginning the Construction Period, provide the County with a site plan identifying structure locations, site access points, and road crossings, to be attached as **Exhibit A**, along with the transportation route for the Project including routes for heavy haul, construction materials, supplies and other construction traffic attached as **Exhibit B**, subject to amendment and approval from Morrow County Public Works Director, County Administrator or designee of County;

c. At least ninety (90) days prior to beginning the Construction Period, provide the County with all design and engineering specifications for Road improvements required for the Project, as attached as **Exhibit C**, subject to amendment and approval from Morrow County Public Works Director, County Administrator or designee of County, which design and engineering specifications shall be consistent with standards per the Morrow County Transportation System Plan;

d. Erect permanent markers indicating the presence of permitted Cables and install tape in any trench in which Developer has placed or will place permitted Cables in a County right-of-way. All Cables shall comply with county permit requirements as specified in the permit. Cables and any other utilities shall be installed with the least intrusion and placement in County right-of-ways;

e. Notify the County Public Works Director in advance of all oversize transportation and crane crossings over, across or along any Road through the Oregon Department of Transportation permitting process;

f. Transport or cause to be transported the structure segments and other oversize loads in a reasonable effort to minimize adverse impact on the local traffic;

g. Provide reasonable advance notice to the County when it is necessary for a Road to be closed due to a crane crossing or for any other reason relating to the construction of the Project. Notwithstanding the foregoing, Developer will provide no less than forty-eight (48) hours' notice when reasonably practicable and will provide all materials necessary to close the Road; If a closure is approved by the Public Works Director, Developer will provide a timeframe of the closure, if closure is more than 20 minutes, Developer will provide public notice via variable message devices and an approved detour with map and signage on detour route;

h. Provide signage of all road closures and work zones in compliance with the Manual on Uniform Traffic Control Devices and as may be required by the County;

i. Maintain any Roads then used by Developer as necessary for Developer's use of such Roads during the Construction Period, which maintenance shall at all times be in compliance with County standards for general public use, and may include, but are not limited toblading of gravel roads, patching of paved roads, and dust abatement caused by Developer's construction related activities during the Construction Period. For purposes of clarity, this Paragraph does not require County to modify its regular repair and maintenance schedule. If Developer determines that maintenance and repair activities in addition to those regularly conducted by County are necessary for Developer's use of the Roads, then such additional maintenance and repair activities shall be performed by Developer at its sole cost and expense pursuant to this subparagraph;

j. Purchase and deliver applicable road materials for repairs to Roads that are damaged by Developer, Developer Representative, Developer contractor, subcontractor, or employee during the Construction Period and bear the reasonable costs to restore any Roads that are damaged by Developer and/or a Developer Representative during the Construction Period to the condition enjoyed immediately prior to or better than prior to such damage occurring. It is the intent of this Agreement that the Roads will remain open for public use during the Construction Period, and Developer will keep all Roads used by it in conditions approved by Morrow County Public Works Director that allow the continued public use of the Roads. If, despite using commercially reasonably efforts, Developer or Developer Representative is unable to repair damage caused by it within the commercially reasonable time frame requested by County to Public Works Director's approval, County may, at its sole discretion, repair such damage and invoice Developer for the cost for such repair. Developer will pay such cost, plus an additional fee of 20% above said cost for County administration. Developer shall reimburse County for the cost of such repairs within sixty (60) days of Developer receipt of an invoice for such costs. County and Developer agree that this Section is not intended to require County to perform the needed road repairs with reimbursement from Developer on a regular basis. It is the intent of County and Developer that Developer will maintain and repair roads during the Construction Period as described in this Agreement, and will only request County assistance if required after exercise of commercially reasonable efforts to repair damage caused by it within the time frame requested by County. Developer will provide a designated person who will be responsible to inspect County's requests for repairs and schedule those repairs within the commercially reasonable time frame requested by County of notice by the County Public Works Director or his designated representative; and

k. Cables may cross a road, in which case, these Cables will be bored under the road, buried at a minimum depth of forty-eight (48) inches below the road surface and the crossing shall be restored to its pre-construction condition within forty-eight (48) hours or otherwise mutually agreed upon; There will be no open-cut trenching in County roads or right-of-ways unless specifically authorized by the Public Works Director in writing.

l. All roads described in **Exhibit B** identified in the preconstruction inventory must be brought to the standard necessary for the use by Developer. Each road will be evaluated during

the preconstruction inventory and mutually agreed upon by the County and Developer and be added to **Exhibit C** for said improvements.

2. The County, in accordance with the terms of this Agreement, agrees that it shall:

a. Designate the County Public Works Director as the representative with authority to represent the County. As of the date of the Agreement, the County representative is: Public Works Director, 541-989-9500;

b. Timely review and approve all design and engineering specifications for Road improvements required for the Project, as attached as **Exhibit C**, which design and engineering specifications shall be consistent with standards per the Morrow County Transportation System Plan;

c. Timely review and approve Developer's Road improvements pursuant to the design and engineering specification approved by County and set forth in **Exhibit C**;

d. Timely perform routine and regular maintenance of the Roads including: grading, snow removal, striping, routine signage, and regularly scheduled maintenance and repair, as per County normal maintenance schedule, at the availability and direction of the County Public Works Director;

e. Timely review and approve all Project-related access points and road crossings, which are submitted by Developer in **Exhibit A and B**;

f. Timely review and approve plans for all Project-related utility encroachments on County rights-of-way; which are submitted by Developer in accordance with **Exhibit A and B**; and

g. Authorize the Public Works Director to agree on behalf of County to revisions to **Exhibit A, B, and C** and the final location of Road crossings, access points, and utility encroachments as revisions are submitted to the County by or on behalf of Developer.

3. Pre-Construction Inventory. No later than thirty (30) days prior to the start of the Construction Period, the Parties shall jointly perform a survey to record the condition of all Roads which will be used in the transport of equipment, supplies and personnel to the Project. During this survey, the entire length of the Roads shall be videotaped and if deemed necessary by the parties, photographs may also be taken. In addition, the County will provide Developer, if available, with copies of any plans, cross-sections and specifications relevant to the existing Roads structure. Copies of all pre-construction documentation shall be provided to each of the Parties. Developer will reimburse the County for all costs associated with the Pre-Construction Inventory at a rate of one-hundred dollars ($100.00) per hour and reimburse the County within forty-five (45) days of invoice date.

4. Post-Construction Inventory. Upon completion of construction of each phase of the Project, representatives of the County and Developer will perform a Post-Construction Inventory, the methods of which shall be similar to those of the Pre-Construction Inventory described above. The two sets of pre-construction and post-construction data will be compared and if there are any wheel lane ruts, cracking or other damage in excess of the original survey and caused by Developer during the Construction Period, the County and Developer will determine the extent of the repairs or improvements needed to return the roads to a pre-construction condition. All costs associated with the Post-Construction Inventory repairs shall be borne solely by Developer. The timeframe of completion of said repairs shall be no later than one hundred twenty (120) days after the Project begins commercial operations, and said repairs are to be scheduled as agreed to by the Parties. Developer will reimburse the County for all costs associated with the Post-Construction Inventory at a rate of one-hundred dollars ($100.00) per hour and reimburse the County within forty-five (45) days of invoice date.

5. Routing and Access Approval. As soon as practical after execution of this Agreement and as necessary throughout the Construction Period, Developer and County shall meet to discuss routing for the transportation of equipment to the Project, Project-related access points, road crossings and Cable locations and the County shall review and approve the same in accordance with Section 2.

6. Agreement Violations. If County determines that a County road or right-of-way has been used by Developer or any designee, employee, or contractor outside of those Roads authorized in **Exhibit B** during the Construction Period, the County will provide to Developer evidence detailing the usage of the road or right-of-way by Developer and allow sufficient time for Developer to determine if it used the road or right-of-way in question. If Developer and County mutually determine that Developer or any designee, employee, or contractor utilized the road or right-of-way, then County may (a) add the road or right-of-way to the list in **Exhibit B**; (b) come to a mutually agreed resolution with Developer.

7. Shared Use. County acknowledges that separate projects may be constructed within Morrow County at the same time as Developer's Project and during the Construction Period. County acknowledges that construction activities by other parties may involve the usage of the same Roads and rights-of-way identified in Exhibit B and used by Developer during the Construction Period. County agrees that Developer will only be responsible for damage (and/or any restoration) caused to County's Roads or rights-of-way by Developer and not by any usage or actions of another party.

8. Mutual Indemnification/Hold Harmless and Liability Insurance Provisions.

a. Indemnity. Each Party (the "**Indemnifying Party**") agrees to indemnify, defend and hold harmless the other Party and such other Party's mortgagees, lenders, officers, employees and agents (the "**Indemnified Party**") against any and all losses, direct or indirect damages (including consequential damages), claims, expenses, and other liabilities, including, without limitation, attorneys' fees, resulting from or arising out of (i) any negligent act or negligent failure to act on the part of the Indemnifying Party or anyone else engaged in doing work for the Indemnifying Party, or (ii) any breach of this Agreement by the Indemnifying Party. This

indemnification shall not apply to losses, damages, claims, expenses and other liabilities to the extent caused by any negligent or willful act or omission on the part of the Indemnified Party.

b. Limitations of Liability. In no event shall Developer or any of its members, officers, directors or employees or the County or any of its Boards, officers or employees be liable (in contract or in tort, involving negligence, strict liability, or otherwise) to any other Party or their contractors, suppliers, employees, members and shareholders for indirect, incidental, consequential or punitive damages resulting from the performance, non-performance or delay in performance under this Agreement.

c. Required Insurance. Developer shall upon commencement of construction of the Project and for the period of construction of the Project, maintain in full force and effect commercial general liability insurance, in the aggregate amount equal to Three Million Dollars ($3,000,000). Developer may utilize any combination of primary and/or excess insurance to satisfy this requirement and may satisfy this requirement under existing insurance policies for the Project.

9. Miscellaneous

a. Remedies and Enforcement. The Parties acknowledge that money damages would not be an adequate remedy for any breach or threatened breach of this Agreement. Each of the parties hereto covenant and agree that in the event of default of any of the terms, provisions or conditions of this Agreement by any Party (the "**Defaulting Party**"), which default is not caused by the Party seeking to enforce said provisions (the "**Non-Defaulting Party**") and after notice and reasonable opportunity to cure, which shall include notice by the Non-Defaulting Party to the Defaulting Party and a period of forty-five (45) days for the Defaulting Party to respond, has been provided to the Defaulting Party, then in such an event, the Non-Defaulting Party shall have the right to seek specific performance and/or injunctive relief to remedy or prevent any breach or threatened breach of this Agreement. The remedies of specific performance and/or injunctive relief shall be exclusive of any other remedy available at law or in equity.

b. Due Authorization. Developer hereby represents and warrants that this Agreement has been duly authorized, executed and delivered on behalf of Developer. The County hereby represents, and warrants that this Agreement has been duly authorized, executed and delivered on behalf of the County.

c. Severability. If any provision of this Agreement proves to be illegal, invalid, or unenforceable, the remainder of this Agreement will not be affected by such finding, and in lieu of each provision of this Agreement that is illegal, invalid, or unenforceable a provision shall be deemed added as may be possible to accurately reflect the intentions of the Parties and so as to make the unenforceable provision legal, valid, and enforceable.

d. Amendments. This Agreement constitutes the entire agreement and understanding of the parties and supersedes all offers, negotiations and other agreements. There are no representations or understandings of any kind not set forth herein. No amendment or modification

to this Agreement or waiver of a Party's rights hereunder shall be binding unless it shall be in writing and signed by both Parties to this Agreement.

e. Notices. All notices shall be in writing and sent (including via facsimile transmission) to the Parties hereto at the addresses set forth in the Preamble (or to such other address as either such Party shall designate in writing to the other Party at any time).

f. This Agreement may not be assigned without the written consent of the Parties, which consent shall not be unreasonably withheld. Notwithstanding the foregoing, Developer may assign this Agreement to its affiliates and may collaterally assign this Agreement to any lender in support of the Project.

g. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, with the same effect as if the signatures thereto and hereto were upon the instrument. Delivery of an executed counterpart of a signature page to this Agreement by telecopy shall be as effective as delivery of an originally signed counterpart to this Agreement.

h. Governing Law. This Agreement shall be governed by and interpreted in accordance with the laws of the State of Oregon, irrespective of any conflict of laws provisions. Both parties desire that the transactions contemplated hereby be effected and carried out in a manner that is in compliance with all laws.

i. Successor and Assigns. This Agreement shall inure to the benefit of and shall be binding upon the Parties hereto, their respective successors, assignees, and legal representatives.

j. If any Term of this Agreement is found to be void or invalid, such invalidity shall not affect the remaining Terms of this Agreement, which shall continue in full force and effect.

k. Failure of County or Developer to insist on strict performance of any of the conditions or provisions of this Agreement, or to exercise any of their rights hereunder, shall not waive such rights.

l. Whenever in this Agreement the approval or consent of either County or Developer is required or contemplated, unless otherwise specifically stated, such approval or consent shall not be made the subject of a demand for additional compensation, nor otherwise unreasonably conditioned, withheld or delayed.

m. In any litigation arising from or related to this Agreement, the parties hereto each hereby knowingly, voluntarily and intentionally waive the right each may have to a trial by jury with respect to any litigation based hereon, or arising out of, under or in connection with this Agreement.

n. Nothing in this Agreement shall be construed as limiting or removing any applicable federal, state, city, county laws, rules, ordinances, or planning requirements.

o. County agrees that any amendment and additions to **Exhibit C** can be approved by the Public Works Director and the County Administrator on behalf of the County.

[remainder of page intentionally left blank]
signatures begin on following page

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed in their respective names by their duly authorized officers.

Developer:

Sunstone Solar, LLC

By: _____
xxxxxxxxxxxxxx

County:

_____ _____
David Sykes, Chair Date

_____ _____
Jeff Wenholz, Vice-Chair Date

_____ _____
Roy Drago Jr., Commissioner Date

Approved as to Form:

By: _____
Name: _____
Title: County Attorney

EXHIBIT A

Site Plan

EXHIBIT B

Transportation Route – "Roads"

EXHIBIT C

Road Improvements