Exhibit U

Public Services

Bakeoven Solar Project
November 2019

Prepared for

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Acronyms and Abbreviations

ADT	average daily traffic
Applicant	Bakeoven Solar, LLC
BMP	best management practice
Council	Oregon Energy Facility Siting Council
ESCP	Erosion and Sediment Control Plan
Facility	Bakeoven Solar Project
Fire Plan	Fire Protection and Prevention Plan
I-84	Interstate Highway 84
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
OAR	Oregon Administrative Rule
ODOT	Oregon Department of Transportation
OWRD	Oregon Water Resources Department
RV	recreational vehicle
US	U.S. Highway

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1.0 Introduction

Bakeoven Solar, LLC (Applicant) proposes to construct and operate a solar energy generation facility and related or supporting facilities in Wasco County, Oregon. This Exhibit U was prepared to meet the submittal requirements in Oregon Administrative Rule (OAR) 345-021-0010(1)(u).

2.0 Applicable Rules and Standards

Under OAR 345-022-0110, the Oregon Energy Facility Siting Council (Council) must find that:

(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.

(2) The Council may issue a site certificate for a facility that will 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.

(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.

3.0 Analysis

This exhibit describes how the proposed 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.

3.1 Analysis Area

The analysis area for public services consists of the area within and extending 10 miles from the proposed site boundary in Wasco County, Oregon. Figure U-1 shows the analysis area. Where noted in the exhibit, communities outside of the analysis area are considered in response to comments received on the Applicant's Notice of Intent (NOI), filed November 2, 2018.

3.2 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 shall include:

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

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

3.2.1 Employment

3.2.1.1 Construction

The Applicant anticipates that construction may begin by as early as June 2020 and proposes to construct the Facility in phases. The size and construction schedule for each phase will depend on market demand. The entire Facility, including all phases, will be completed by 2025 unless the Applicant seeks an amendment to extend the construction deadline (see Exhibit B). For the purposes of analysis, Facility construction of any phase is assumed to take approximately 9 to 12 months from the time of permit approval to commercial operation.

During construction, an estimated average workforce of 250 people will be employed, with a maximum of 400 people during the peak months of 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 battery storage but likely will not significantly affect the maximum number of employees at any given time.

Construction workers will include a mix of locally hired workers within 50 miles of the proposed site boundary (e.g., from Wasco, Sherman, Gilliam, Wheeler, and Jefferson counties) for road and building construction, and specialized workers for solar energy generation construction (e.g., substation and electrical transmission construction, solar array, and battery storage). For purposes of this analysis, the conservative assumption was made that 30 percent of construction workers will be hired locally and the remainder from outside the four-county area. Local hiring may be greater and will depend on the availability of workers with appropriate skills. The Applicant's policy will be to hire locally to the extent practicable.

3.2.1.2 Operations

An estimated 5 to 10 employees will be hired to operate and maintain the Facility. The actual number of operational staff will depend on size of the Facility. Some of the operations and maintenance (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. Some specialized outside contractors may also be required on occasion.

3.2.1.3 Retirement

When the Facility is retired, operational jobs will be eliminated; however, there may be short-term contract jobs to monitor restored areas. The activities to remove solar arrays, overhead collection lines, and other related or supporting facilities will likely require a workforce of similar size to the average workforce needed for the construction of the Facility (about 250 people). Retirement of the Facility will require removal of most Facility components and restoration of disturbed areas. These activities will result in temporary employment levels similar to those experienced during Facility construction.

3.2.2 Population

3.2.2.1 Construction

Population will change very little as a result of Facility construction. Approximately 30 percent of the construction workers are expected to be local residents (from Wasco, Sherman, Gilliam, Wheeler, and Jefferson counties), and an average of about 175 and a maximum of about 280 workers will be temporary residents (in-migrants). The actual number of temporary residents may be fewer due to a combination of more local hiring and fewer workers bringing families or others with them. The in-migrants, and their families, will likely settle in hotels, motels, recreational vehicle (RV) parks, houses, and other temporary housing located within a commutable distance to the Facility (50 miles). An average household size of 2 is conservatively assumed for construction workers coming from outside the area, resulting in an estimated maximum of about 560 temporary residents during the peak construction period.

3.2.2.2 Operations

The number of new permanent residents resulting from Facility operations will be small. An estimated 5 to 10 employees will be hired to operate and maintain the Facility, and some will already be local residents. Assuming conservatively that 50 percent (3 to 5) of these employees are in-migrants with an average household size of 3 (higher than for temporary employees), up to 15 new permanent residents could be added to the local population. It is assumed that these workers will live locally. The Applicant may also rely on O&M staff from its operating projects in Sherman County or Crook County to provide operational support for the Facility.

3.2.3 Transportation

Various transporter routes will provide access to the Facility during construction and operations. These routes will be used to bring in 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. Major transporter routes are depicted in Figure U-2.

3.2.3.1 Primary and Alternate Transportation Routes

The primary transporter route is assumed to carry the majority of construction-related heavy-duty and light-duty delivery vehicles, as well as workforce traffic. The primary route for construction vehicles and workforce traffic will be via Interstate Highway 84 (I-84) and exit southbound on U.S. Highway (US) 197 near The Dalles, continuing south through the town of Maupin and then east onto Bakeoven Road to the proposed site boundary. This route is assumed to be the primary transporter route because most of the construction-related traffic is from workforce commute trips, and towns most likely to provide temporary housing (e.g., The Dalles) are located on this route (Attachment U-1).

An alternate transporter route will be via I-84 to US 97 (Sherman Highway) at Biggs Junction, southbound through the town of Shaniko, and continue west and north on Bakeoven Road to the proposed site boundary. The alternate route would be the preferred route for the limited oversize deliveries for Facility construction, such as support poles for the transmission line or the main power transformers. Some workforce traffic may also come from south of the Facility (e.g., Madras), taking US 97 north/northeast to Bakeoven Road and then continuing north to the site boundary.

Operational staff are expected to commute to the Facility site from nearby communities. 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.

3.2.3.2 Truck Traffic

For the purposes of the traffic impact analysis, the Applicant assumes an average of 630 truck trips per day (315 roundtrips), with a peak of 750 trips (375 roundtrips), will be needed over approximately 250 construction work days (about 12 months). This is based on the estimated average and maximum peak workforce, with a carpool factor of 2 persons per vehicle for survey crews and 1.5 persons per vehicle for all other categories. Attachment U-1 provides the Bakeoven Solar Traffic Report with additional details about the assumptions used to estimate construction-related traffic for the Facility. Anticipated transportation volumes are discussed further in Section 3.4.7 below.

A variety of truck types will be required for material and equipment deliveries (see Attachment U-1 for a complete list). 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, single-unit water tank trucks delivering water to the site will be required. Water will be needed for dust control during road construction and for the temporary concrete batch plants. 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.

3.2.3.3 Points of Origin

During construction, an estimated average workforce of 250 people will be employed (175 in-migrants), with a potential maximum of up to 400 people (280 in-migrants) on site at one time, when multiple disciplines of contractors complete their work simultaneously during periods of the highest activity. As identified in Section 3.2.1.1, local workers will most likely originate from areas within approximately 50 miles of the proposed site boundary or will temporarily relocate to communities within this area. Workers needed for specialized construction (e.g., substation and electrical transmission construction, solar and battery storage installation) may originate from areas outside this commutable distance. Construction workers may find housing in several towns on both the primary and alternate transporter routes (see Section 3.3.2.5, Housing). Given the relative sizes of towns within a commutable distance, the traffic estimates assume 70 percent of the workforce traffic will use the primary transporter route, 20 percent will use the alternate transporter route, and 10 percent will originate from south of the Facility, using US 97 north to Bakeoven Road (Attachment U-1).

An estimated 5 to 10 personnel will be hired for operation and maintenance of the Facility. It is assumed that these workers will live locally.

3.3 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 will likely be affected.

The following subsections address the existing socioeconomic conditions and public and private service providers within 10 miles of the proposed expanded site boundary that could be affected by construction and operation of the Facility.

3.3.1 Counties, Cities, and Communities

While the Facility itself is entirely within Wasco County, the 10-mile analysis area includes incorporated communities within portions of both Wasco County and Sherman County (Figure U-1). Table U-1 presents historical population estimates for communities in Wasco County within the analysis area. Although there are no incorporated communities in Sherman County that are within 10 miles of the Facility, the county as a whole was included due its proximity to the Facility. Maupin, located to the west of the Facility in Wasco County, is the largest community in the analysis area. Maupin had a 2017 population of approximately 623 people, 2.3 percent of the two-county area's population total.

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

Location	Population			2000-2010		2010 -2017	
	Census 2000	Census 2010	Estimated 2017	Absolute Change	Percent Change	Absolute Change	Percent Change
OREGON	3,421,399	3,831,074	4,025,127	409,675	12.0	194,053	5.1
Wasco County	**23,791**	**25,213**	**25,687**	**1,422**	**6.0**	**474**	**1.9**
Maupin	411	418	623	7	1.7	205	49.0
Shaniko	26	36	3	10	38.5	-33	-91.7
Tygh Valley	224	206	201	-18	-8.0	-5	-2.4
Sherman County	**1,934**	**1,765**	**1,635**	**-169**	**-8.7**	**-130**	**-7.4**
Kent[1/]	-	-	-	-	-	-	-

Source: U.S. Census Bureau 2000, 2010, 2017.

1/ Kent, Oregon does not have population data tracked by the U.S. Census Bureau. but is an unincorporated community with a small cluster of residences, agriculture-related buildings, a church, and a post office.

The community of Antelope is just outside of the analysis area, approximately 8 miles south of Shaniko. In comments on the NOI, Wasco County noted Antelope as a nearby community that may experience impacts due to temporary housing demand for the Facility. All communities within a commutable distance are considered in the housing analysis (see Section 3.4.6).

According to the U.S. Census Bureau (2015) residence to workplace data for 2011 to 2015, nearly 83 percent of Wasco County residents work within Wasco County (8,912 commuters per day). Wasco County receives 612 Hood River County, Oregon commuters per day, 594 Klickitat County, Washington commuters per day, 137 Sherman County, Oregon commuters per day, and 112 Jefferson County, Oregon commuters per day. The remaining 304 commuters to Wasco County travel from multiple other, more distant counties.

3.3.2 Service Providers

3.3.2.1 Sewers and Sewage Treatment

Within the analysis area, the City of Maupin has a municipal sewer system and treatment facility. Unincorporated communities in the analysis area generally use onsite private septic systems for sewage disposal. No community in the analysis area currently provides sewers or sewage treatment to the Facility site. The Applicant will construct a septic system at the O&M building located within the proposed site boundary.

3.3.2.2 Water

Most of the communities in the analysis area have public water systems that serve their respective areas, but those systems will not be used or affected by the Facility. During construction, water will

most likely be obtained from the City of Maupin. The City can provide sufficient water to meet the Facility requirements (see Exhibit O). During operations, water will be provided by a newly constructed well near the O&M building, providing no more than 5,000 gallons per day, or from an existing commercially available well. See Exhibit O for a more detailed discussion.

3.3.2.3 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 Wasco County. 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. A copy of the draft permit application is included as Attachment I-1 to Exhibit I.

3.3.2.4 Solid Waste Management

The incorporated communities near the Facility will provide solid waste management services to their respective incorporated areas. Waste Connections, Inc. provides collection, transfer, and recycling services in the Wasco County area. 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 nearest to the Facility is the Wasco County Landfill owned by Waste Connections, Inc., in The Dalles. The Wasco County Landfill has confirmed that it has sufficient capacity to accommodate the Facility's solid waste needs and has projected that 45 years are left in landfill's current footprint. To accommodate the 40-year Project lifespan, the Wasco County Landfill has confirmed they have options to expand its current footprint that would extend the life of the landfill past 45 years (see Attachment U-2).

3.3.2.5 Housing

Housing is provided to varying degrees in all of the incorporated and unincorporated communities within the analysis area, and within a commutable distance from the Facility (50 miles) outside of the analysis area.

Table U-2 presents housing supply and availability data for counties and communities within a commutable distance. An estimated 4,748 housing units were available in 2017 in communities within a commutable distance. Housing vacancy rates for 2017 ranged from zero percent in Tygh Valley and other communities to 62.5 percent in Shaniko. The 2017 seven-county average vacancy rate of approximately 18.2 percent is higher than the state of Oregon's average of 9.3 percent. Although the available housing units have decreased for a majority of nearby communities, most communities continue to experience vacancy rates greater than 10 percent.

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

Location	Total Housing Units		Average Annual Growth Rate (%) 2010-2017	Estimated Vacancy Rate (%) 2017	Vacant Housing Units Estimated 2017
	2010	Estimated 2017			
OREGON	1,675,562	1,733,041	0.6	9.3	161,410
Wasco County	**11,487**	**11,600**	**0.2**	**12.6**	**1,465**
Antelope	43	40	-1.2	12.5	5
Chenoweth	752	821	1.5	1.8	15
Dufur	263	239	-1.5	10.5	25
Maupin	274	363	5.4	25.3	92
Mosier	250	306	3.7	23.2	71
Pine Grove	103	78	-4.0	20.5	16
Pine Hollow	488	483	-0.2	47.4	229
Rowena	111	87	-3.6	19.5	17
Shaniko	24	8	-11.1	62.5	5
The Dalles	5,903	6,518	1.7	5.2	338
Tygh Valley	110	101	-1.4	0.0	0
Wamic	50	44	-2.0	0.0	0
Sherman County	**918**	**943**	**0.5**	**17.4**	**164**
Biggs Junction	9	12	5.6	0.0	0
Grass Valley	92	82	-1.8	17.1	14
Kent[1/]	-	-	-	-	-
Moro	193	185	-0.7	13.5	25
Rufus	141	116	-3.0	17.2	20
Wasco	208	197	-0.9	7.1	14
Clackamas County	**156,945**	**163,650**	**0.7**	**6.0**	**9,828**
Government Camp	630	781	4.0	94.6	739
Mount Hood Village	3,635	4,122	2.2	47.9	1974
Gilliam County	**1,156**	**1,070**	**-1.2**	**24.8**	**265**
Arlington	315	252	-3.3	11.9	30
Condon	455	409	-1.7	27.1	111
Lonerock	25	21	-2.7	52.4	11
Hood River County	**9,271**	**9,697**	**0.8**	**11.9**	**1,154**
Hood River	3,473	3,540	0.3	9.9	349
Mount Hood	121	61	-8.3	0.0	0

Location	Total Housing Units		Average Annual Growth Rate (%) 2010-2017	Estimated Vacancy Rate (%) 2017	Vacant Housing Units Estimated 2017
	2010	Estimated 2017			
Odell	686	568	-2.9	5.3	30
Parkdale	118	109	-1.3	0.0	0
Jefferson County	**9,815**	**9,951**	**0.2**	**23.3**	**2,323**
Culver	482	529	1.6	6.6	35
Madras	2,569	2,647	0.5	15.2	402
Metolius	297	340	2.4	6.8	23
Warm Springs	747	901	3.4	9.3	84
Wheeler County	**895**	**984**	**1.7**	**31.2**	**307**
Fossil	265	272	0.4	15.1	41
Mitchell	83	80	-0.6	41.3	33

Source: U.S. Census Bureau 2010, 2017.

[1]/ Kent, Oregon does not have population data tracked by the U.S. Census Bureau, but is an unincorporated community with a small cluster of residences, agriculture-related buildings, a church, and a post office.

3.3.2.6 Traffic Safety and Transportation

The provider of transportation services in Wasco County is the Wasco County Road Division 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 Transporter Route

The primary transport route of construction vehicles and some workforce traffic will be via I-84 to US 197 near The Dalles, continuing south through the town of Maupin and then east onto Bakeoven Road to the proposed site boundary. The roads in the primary transportation route include interstate, state, and county roadways. I-84, also known as the Columbia River Highway Number 2, serves as the primary east-west route through Wasco County. I-84 is a four-lane divided highway, with two lanes traveling in each direction and 6-foot paved shoulders. US 197 is a two-lane highway, undivided, that ODOT classifies as a Regional Highway with a Special Transportation Area designation in the City of Maupin (Wasco County 2009). The Special Transportation Area designation allows for more access points and less mobility (i.e. slower speed) through the City of Maupin than would otherwise be permitted on a regional state highway. Bakeoven Road from Maupin, west of the Facility, as well as US 197 are not as suitable for oversize or overweight trucks because of limitations caused by the physical terrain. Such trucks will use the alternate transporter route. County roadways on the primary transporter route include Bakeoven Road, a two-lane highway.

Alternate Transporter Route

An alternate transporter route will be via I-84 to US 97 (Sherman Highway) at Biggs Junction, southbound through the town of Shaniko, and continue west and north on Bakeoven Road to the proposed site boundary. US 97 begins at the I-84 junction, extends through Biggs Junction, and continues south into central Oregon. The portion of US 97 that passes by the Facility is primarily two lanes (one lane in each direction, undivided) with varying paved shoulder widths. ODOT classifies this road as a Statewide Highway, a classified Freight Route, and a Scenic Byway (Wasco County 2009). The posted speed limit is 50 miles per hour, except on various curves and grade changes where the speed limit is reduced to between 30 and 40 miles per hour.

Traffic Volumes

Table U-3 provides updated traffic volumes for the expected transporter routes. State highway volumes were published in the 2013 through 2017 Traffic Volume Tables (ODOT 2017). Table U-3 shows the average daily traffic (ADT) volumes for the most recent 5 years of data available at various milepost locations along the transporter routes.

Table U-3. Transporter Route Average Daily Traffic Volumes

Highway	Location	Milepost	2013	2014	2015	2016	2017	Percent Change 2013-2017
I-84 (No. 9)	0.24 miles west of Brewery Grade Interchange	85.27	22,200	21,500	22,500	23,500	23,600	6
I-84 (No. 9)	0.30 miles east of Brewery Grade Interchange	85.81	21,300	21,500	22,300	23,300	23,400	10
I-84 (No. 9)	0.30 miles east of The Dalles-California Highway (US 197)	87.31	15,500	15,900	16,500	17,400	17,000	10
I-84 (No. 9)	0.30 miles east of The Dalles Dam Interchange	89.13	15,100	15,600	16,100	17,100	16,700	11
US 197 (No. 9)	Washington-Oregon State Line, The Dalles Bridge	0	6,200	6,600	7,100	7,200	7,100	15
US 197 (No. 9)	0.15 miles south of Columbia River Highway Interchange (I-84)	0.79	5,300	6,000	6,300	6,600	6,000	13
US 197 (No. 9)	0.10 miles south of Mosier-The Dalles Highway (US 30)	1.01	5,400	3,200	3,300	3,500	5,900	9

Highway	Location	Milepost	2013	2014	2015	2016	2017	Percent Change 2013-2017
US 197 (No. 9)	0.02 miles south of NE Fremont Street	1.24	3,000	3,700	3,900	4,100	3,700	23
US 197 (No. 9)	Dufur Automatic Traffic Recorder, Sta. 33-005, 0.84 mile south of Boyd Market Road (North Jct.)	10.3	2,400	2,400	2,600	2,800	2,900	21
US 197 (No. 9)	0.05 mile south of Boyd Loop Road	13.27	1,300	1,000	1,100	1,100	1,400	8
US 197 (No. 9)	On Mays Canyon Creek Bridge	16.08	1,300	1,100	1,100	1,200	1,400	8
US 197 (No. 9)	0.02 mile south of Dufur Gap Road	22.87	1,400	1,200	1,300	1,300	1,400	0
US 197 (No. 9)	0.05 mile north of Sherars Bridge Highway (OR 216)	33.84	1,400	1,200	1,300	1,300	1,500	7
US 197 (No. 9)	0.05 mile south of Sherars Bridge Highway (OR 216)	33.94	970	1,000	1,100	1,100	1,100	13
US 197 (No. 9)	0.07 mile north of Wapinitia Highway (OR 216)	42.36	990	1,000	1,000	1,100	1,200	21
US 197 (No. 9)	0.05 mile south of Wapinitia Highway (OR 216)	42.48	980	1,000	1,100	1,100	1,100	12
US 197 (No. 9)	0.30 mile south of Deschutes Avenue, west city limits of Maupin	43.96	1,100	1,000	1,100	1,100	1,200	9
US 197 (No. 9)	On Deschutes River Bridge	45.84	1,100	1,100	710	1,200	1,300	18
US 197 (No. 9)	0.02 miles south of Bakeoven Road	45.98	740	670	460	780	920	24
US 97 (No. 9)	Oregon-Washington State Line, Samuel Hill Memorial Bridge	-0.43	5,100	4,100	5,800	5,300	5,400	6
US 97 (No. 9)	0.07 mile south of Columbia River Highway (I-84)	-0.06	7,800	7,900	8400	7,600	7,800	0

Highway	Location	Milepost	2013	2014	2015	2016	2017	Percent Change 2013-2017
US 97 (No. 9)	0.02 mile south of Celilo-Wasco Highway Spur	0.05	3,700	3,200	3,500	3,200	3,300	-11
US 97 (No. 9)	0.30 mile south of Wasco-Heppner Highway (OR 206)	7.8	2,700	2300	2,500	2,600	2,700	0
US 97 (No. 9)	0.40 miles south of Celilo-Wasco Highway (OR 206)	9.22	2,000	1,900	2,100	2,600	2,600	30
US 97 (No. 9)	Wasco Automatic Traffic Recorder, Sta. 28-001, 0.83 mile northwest of 1st Street	17.36	2,700	2,700	2,900	3,000	3,100	15
US 97 (No. 9)	0.02 mile southwest of 1st Street	18.21	2,900	2,700	2,800	2,900	3,000	3
US 97 (No. 9)	0.02 mile south of North Street	27.68	2,800	2,500	2,700	2,600	2,700	-4
US 97 (No. 9)	0.02 miles north of Union Street	27.91	2,500	2,400	2,600	2,600	2,700	8
US 97 (No. 9)	0.02 mile north of Sherars Bridge Highway (OR 216)	28.34	2,000	2,100	2,200	2,300	2,400	20
US 97 (No. 9)	0.02 mile south of South Street, south city limits of Grass Valley	28.45	1,900	2,000	2,200	2,300	2,300	21
US 97 (No. 9)	0.02 mile northeast of Shaniko-Fossil Highway (OR218)	56.51	1,800	1,800	1,900	2,200	2,300	28
US 97 (No. 9)	0.20 mile east of The Dalles-California Highway (US197)	68.46	1,800	1,900	2,100	2,300	2,300	28
Source: ODOT 2013-2017								

Table U-3 shows that from 2013 to 2017, ADT volumes increased by approximately 9 percent on average for I-84, while volumes for the alternate US 97 roadway segments increased by approximately 11 percent on average over the same time period. US 197, which generally carries

much lower volumes than I-84 (38,120 trips per day on US 197 compared to 80,700 trips per day on I-84, as of 2017), saw an increase of 303 trips per day between 2013 and 2017.

Because of the rural nature of the analysis area, recent traffic counts on county roads proposed for use in transporter routes are not available. The counties do not monitor traffic volumes on a yearly basis. The most recent version of the Wasco County Transportation System Plan (Wasco County 2009) indicates that the County only has one year of traffic-count data (2007-2008) for a select group of roadway segments in the County. Traffic data in the Transportation System Plan indicate that, in general, traffic volumes on county roadways are low. Rural major collector roads in the county could be expected to carry approximately 2,000 vehicles per day, while rural minor collector roadways could carry approximately 400 vehicles per day (Wasco County 2009). County roadway volumes are minimal, with some increase during the summer and early fall for harvest of various crops in the area as well as recreational uses along the Deschutes River.

In comments on the NOI, the City of Maupin noted the town is extremely busy during their peak tourist season from mid-June through early September. The Applicant reached out to the City of Maupin for additional information regarding local traffic (Attachment U-3). The City confirmed that for much of the year, traffic is not an issue with only approximately 400 people in town. However, during the summer tourist season, they receive over 100,000 visitors and weekend traffic can be particularly heavy. The City identified peak traffic times as 9 to 11 AM and 2 to 4 PM, where traffic is still moving but slower and heavier. According to the City, the intersection of US 197 and Bakeoven Road is a pinch point (see Section 3.4.7).

Pavement Conditions

Pavement conditions may influence traffic safety issues. Poor pavement with potholes might cause vehicles to swerve, resulting in unsafe vehicle operation. ODOT's 2018 Pavement Condition data were reviewed for state highway transportation routes (ODOT 2019). Table U-4 shows the conditions for state highways expected to be used as part of the primary and alternate transporter routes.

Table U-4. Pavement Condition for State Highway Transportation Routes

Roadway	Approximate Milepost	Pavement Condition
I-84 (No. 9)	MP 76 to 111	Very Good
US 197 (No.9)	MP 0.5 to 18	Good
US 197 (No.9)	MP 18 to 27	Fair
US 197 (No.9)	MP 27 to 46	Good
US 97 (No. 9)	MP 0 to 19	Good
US 97 (No. 9)	MP 19 to 27	Fair
US 97 (No. 9)	MP 27 to 56	Very Good
Source: ODOT 2019		

The majority of the state highway transporter routes are in either very good or good condition. There is one segment of US 197 with a fair rating, from approximately MP 18 to 27 in between the towns of Dufur and Tygh Valley. On the alternate route, one segment from approximately MP 19 to 27 in between Moro and Grass Valley is rated as fair. A fair rating indicates minor or low severity pavement deficiencies that typically lead to treatment such as chip seal or light resurfacing (ODOT 2019); however, fair conditions do not indicate a safety hazard.

A section of US 97 from Shaniko to milepost 58.8, south of the Facility, was rated as poor condition in 2016, and is now listed as under construction for 2018, which is expected to result in improved conditions prior to Facility construction. This portion of US 97 may be used for some workforce traffic but is not part of the primary or alternate transporter routes for larger construction vehicles.

Local county roadways are either paved or graveled, with Bakeoven Road being paved, and Wilson Road and the unnamed existing ranch road being graveled.

3.3.2.7 Police Protection

Local police service is provided by most of the incorporated cities in the Facility analysis area. A letter from the Wasco County Sheriff's Office confirms that they can provide services in the analysis area (see Attachment U-4). Backup law enforcement service is available from the Oregon State Police Central Region, with offices in Madras, The Dalles, Government Camp, and Prineville.

3.3.2.8 Fire Protection

Juniper Flat Rural Fire Protection District provides the closest, fully-equipped fire protection service to the Facility area (see Attachment U-5). The closest fire department in Maupin does not have the equipment or personnel to cover some fire emergencies and is often assisted by the Juniper Flat Rural Fire Protection District. Due to the Facility location just outside of the eastern boundary of the Juniper Flat Rural Fire Protection District, a contractual agreement with a Fire Protection and Prevention Plan (Fire Plan) would need to be in place to provide 24-hour, 7 days a week emergency service. This contract will be completed prior to Facility operation. The Applicant will notify the Juniper Flat Rural Fire Protection District of construction plans and phasing, identify the location of and access to Facility structures, and provide mutual assistance in the case of fire within the Facility. The site will be equipped with fire protection equipment in accordance with the Oregon Fire Code (see Exhibit B).

The Applicant has also met with the newly formed Bakeoven-Shaniko Rangeland Fire Protection Association and will coordinate with the Oregon State Fire Marshall as needed. Services from communities in the region that provide their own fire service, such as Maupin noted above as well as Dufur and The Dalles, will not be required by the Facility.

3.3.2.9 Health Care

Because population in the analysis area is relatively sparse, hospitals and health care services tend to be regional in nature. There are no hospitals within the analysis area. The hospitals nearest to

the Facility are the Mountain View Hospital located in Madras (about 46 miles away by car from the southern portion of the Project) and the Mid-Columbia Medical Center in The Dalles (about 52 miles away by car from the northern portion of the Project). Wasco County provides ambulance service in the analysis area through contracts with private service groups; they operate four ambulances stationed in Maupin, Wasco, and The Dalles. Providers offer basic, intermediate, and advanced life support emergency medical care and transportation.

3.3.2.10 Schools

A total of two school districts and five individual schools (serving 688 students total) provide educational services to the zip codes located in the analysis area. The schools closest to the Facility are operated by the South Wasco County School District #1, which services the entire southern region of Wasco County. South Wasco County has both an elementary school and high school, Maupin Grade School and South Wasco County High School, both located in Maupin, less than 10 miles from the proposed Facility. There are also several public schools located in Madras, Oregon, approximately 35 miles from the proposed Facility's southern site boundary.

3.4 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.

3.4.1 Economic and Demographic Impacts

Together the number of new temporary construction jobs and new operations jobs created from Facility construction and operations will represent less than 1 percent of total employment in Wasco County (a total of 11,051 jobs in Wasco County [U.S. Bureau of Labor Statistics 2017]). Similarly, new temporary and permanent populations will represent a small fraction of total county population. Because the Facility and the jobs will be located in an unincorporated part of the county, they will not directly affect the employment base of a specific city or town. The jobs created by the Facility will result in short-term and long-term benefits to overall county employment.

3.4.1.1 Population and Housing

Limited in-migration for construction-related employment and permanent O&M employment are expected to occur because of the proposed Facility. Temporary construction-related jobs filled from outside of the analysis area are anticipated to last no more than 12 months, but during that time workers likely will stay at area motels, eat at local restaurants, and purchase other amenities such as gas and groceries, all having a beneficial impact on the local economy. An estimated 5 to 10 staff will be employed at the Facility for O&M. Some of the 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 workers will live locally.

In-migrant operational staff and their families will not have a significant impact on local population. Assuming conservatively that 50 percent (three to five) of the O&M positions are filled from outside the analysis area and the average household size is 3 (higher than for temporary employees), approximately 15 new residents could be added to the local population. That number is small in comparison to the populations of Wasco and Sherman counties. Therefore, the Facility is not likely to result in adverse impacts to communities within the analysis area.

Potential impacts on housing could result 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 two to five new households may be required starting at the beginning of operations. It is not known where the new temporary and permanent residents associated with the Facility will settle and what type of housing they will select. No significant adverse impacts to available housing are anticipated (see Section 3.4.6 for additional information).

3.4.1.2 Economic Activity and Tax Revenues

Revenue generated for the local economy will benefit public services, including schools and others services Wasco County provides for its citizens. Surrounding counties would not gain revenue from the site 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 because of the proposed Facility will contribute to the local economy indirectly through local purchases. In addition, the proposed Facility itself will purchase goods and services from local and regional businesses, 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. All of this activity will result in a net inflow of dollars into the local economy that will have a beneficial effect beyond that of the new employment.

Development of the Facility will result in an increase in annual property tax revenue to Wasco County. In addition, Facility development will raise the value of other properties because of the increase in wages and overall economic activity in the analysis area. The additional tax revenue generated by the existence of the Facility will increase the county's ability to provide roadways, police and fire protection, and other services to its citizens. Therefore, the Facility will likely have beneficial economic consequences.

3.4.2 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. Sewage from portable toilets will be pumped regularly and disposed of at a local treatment facility. The Applicant will install kitchen and bathroom facilities in the O&M building. The domestic-strength waste will be treated by the

building's on-site septic system. No other sewage treatment will be needed for Facility operations. The Applicant does not anticipate requiring connection to sewers and 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.

3.4.3 Water

It is estimated that approximately 58 million to 77 million gallons of water will be required for the Facility during construction and 1 million gallons per year required for module washing during operations (see Exhibit O). Most of the water required for construction will be used to control dust and maintain compaction on access roads. Water for construction will be purchased from the City of Maupin pursuant to an existing municipal water right held by the City. The Facility's water demand is not expected to injure the City's existing water right or exceed the amount of waver available to the City (see Exhibit O). Alternatively, water will be provided from an existing or newly constructed well under a limited license to be issued by the Oregon Water Resources Department (OWRD).

Kitchen and bathroom facilities will be installed in the O&M building. The Applicant expects to rely on an exempt well allowed under Oregon Revised Statute 537.545 to provide water to the O&M building. Nominal water amounts of water will be needed for domestic purposes (hand washing, drinking, toilets) and an on-site exempt well will provide less than 5,000 gallons per day for domestic use. Given that the operational needs of the Facility represent an insignificant fraction of the total municipal water use in the analysis area, existing water rights will not be detrimentally affected and sufficient water is available for the intended uses. If water is needed for industrial uses, such as solar panel washing, it will come either from the City of Maupin, from a local landowner with water rights from an existing or newly constructed well operating under a limited license. The Applicant contacted the OWRD (pers. phone comm., December 6, 2018) and received confirmation that the exempt well may continue to be used during the operational phase as long as withdrawals maintain compliance with Oregon Revised Statute 537.545(1)(f) by not exceeding 5,000 gallons per day without securing a withdrawal permit. Therefore, no adverse impacts to water use and supply are anticipated during construction or operations.

3.4.4 Stormwater Drainage

Stormwater drainage impacts could occur during construction of Facility components, including new and improved roads, staging areas, and concrete foundations. Application of the erosion control measures developed pursuant to 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. A copy of the draft permit application is included as Attachment I-1 to Exhibit I. The proposed site boundary is a rural area where existing stormwater infrastructure is limited to minimal facilities associated with public roads. BMPs used for erosion control during construction will not affect the provision of stormwater management services by any public agency. Facility components will be designed to

maintain existing stormwater drainage patterns. The proposed micrositing corridor is not within a designated drainage district or urban area. Most of the area within the micrositing corridor is vegetated, which will serve as a buffer to promote infiltration and minimize erosion. For the above reasons, 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.

An industrial stormwater permit is not required for operations at this Facility because no ground-disturbing activities will take place during operations, no stormwater will be discharged to surface waters of the state, 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.

3.4.5 Solid Waste Management

Potential impacts from the Facility on the ability of communities to provide solid waste management services could result if the solid waste management needs from the Facility (during either construction or operations) cannot be met through existing facilities or if meeting those needs 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 adjacent Wasco County Landfill if necessary. The Wasco County Landfill has adequate capacity to accommodate construction-related debris and is not expected to reach its full capacity for another 45 years (with options to expand the current footprint to accommodate future needs; see Attachment U-2). The Wasco County Landfill expanded its capacity in 2001 and currently has a solid waste disposal permit that is valid until 2024 (ODEQ 2014). As described in Exhibit G, little construction waste will require off-site disposal, and only minimal amounts of solid waste will be generated by the Facility during operations. Solid waste disposal for the Facility during construction and operations will be provided through a private contract with local commercial haulers and is not anticipated to disrupt services already being provided in any incorporated communities or in the larger Wasco County area. 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.

3.4.6 Housing

Potential impacts on housing could result 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 known where the new temporary and permanent residents associated with the Facility will settle and what type of housing they will select.

The size of the skilled local workforce is continually growing as more solar energy projects are built in eastern Oregon. As discussed below, additional workers are likely to commute daily from communities outside the analysis area (e.g., The Dalles, Dufur, Warm Springs, Madras), which would lessen impacts to housing associated with the in-migration of outside workers.

Based on employment and population projections for the Facility, additional temporary housing could be required for up to 280 new households during the peak construction period and about 175 new households on average during the 9 to 12-month construction period. However, this is based on the conservative assumption that 30 percent of construction workers will be hired locally—and thus not require temporary housing—while the remainder would be from outside the 50-mile commuting distance. The actual number of temporary residents may be fewer if more locals are hired. In addition, while the household estimates assume the entire Facility would be constructed in one period, construction of the Facility is proposed to take place over three to four years split into three smaller phases (see Exhibit B). Consequently, any Facility-related housing demand would be less than the maximum estimates provided above.

Motels, hotels, and trailer or RV parking will be the most available housing option for temporary residents. A desktop search identified more than 1,000 hotel and motel rooms in communities within a commutable distance (50 miles) to the Facility (The Dalles Area Chamber of Commerce 2018; Travel Oregon 2018; Tripadvisor.com 2018). Some hotels and lodges are available in Maupin (5 miles away), Shaniko (8 miles away), and Dufur (20 miles away). Maupin and Grass Valley also have multiple campground and RV park options. Most rooms were found in Madras and The Dalles, which are located approximately 40 miles away. Additional rooms may be available in establishments that do not have information available online. Additional temporary housing will be available in overnight facilities located at private RV campgrounds.

If all non-local construction workers sought temporary housing within the 10-mile analysis area, there would not be enough supply to meet that demand, and mitigation, such as onsite temporary housing facilities, would be needed to avoid a significant housing impact in local communities. However, this is not a reasonable assumption. Industry experience indicates that construction workers are unlikely to relocate if commuting to work is an option, and that commuting an hour, or more is common. A 50-mile commute distance is therefore also a conservative estimate based on keeping commute times to an hour or less. That distance includes the cities of Madras and The Dalles that have greater housing availability as noted above, as well as other amenities when compared to options within 10 miles, which would attract workers in need of temporary housing. Although not all housing facilities will have vacancies at any given time, adequate supplies are available within a commutable distance in relation to the number of temporary workers, especially given a phased construction approach (see Exhibit B). Furthermore, experience with energy facility construction, for example during the peak of wind power construction in 2009 and 2010 near the city of Arlington, Oregon, demonstrates that multiple facilities can be built in an area comparable to the analysis area without creating local housing issues. Therefore, no significant adverse housing impacts from Facility construction are anticipated.

Permanent housing for about three to five new households (with up to 3 people per household) may be required starting at the beginning of operations. For the up to 15 new permanent residents anticipated 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 distance from the Facility outside of the analysis area. Given the factors described in

this section and 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.

3.4.7 Transportation: Traffic Safety and Roadway Impacts

3.4.7.1 Construction Impacts

Traffic Volumes

It is estimated that an average of 630 trips per day (315 roundtrips), with a peak of 750 trips (375 roundtrips), will be needed over approximately 250 construction work days (about 12 months). This is based on the estimated average and maximum peak workforce, with a carpool factor of 2 persons per vehicle for survey crews and 1.5 persons per vehicle for all other categories. The majority of these trips, approximately 60 percent, are commuting trips by the workforce. The remaining trips are for material deliveries, with the smallest amount for construction equipment deliveries (Attachment U-1).

Bakeoven Road will see the largest number of trips, as delivery of aggregate, concrete, and water may originate within the length of Bakeoven Road. Over-weight or oversize deliveries, such as the transmission line poles and collector substation transformer, would use the alternate transporter route. As noted earlier, workforce traffic will also be divided among the primary and alternate routes, with some traffic also using US 97 from south of the Facility up to Bakeoven Road. Based on the anticipated distribution of construction-related traffic, peak ADT is estimated to be 364 trips on US 197, 92 trips on US 97 (north, part of alternate route), 46 trips on US 97 (south, workforce-only), and 750 trips on Bakeoven Road. See Attachment U-1 Bakeoven Solar Traffic Report for a detailed breakdown of assumed truck types, material and equipment deliveries, and routes.

As described in Section 3.3.2.6, in 2017 I-84 carried an ADT volume of approximately 80,700 vehicles between The Dalles and Biggs Junction, Oregon. Based on the above ADT estimates, for the construction period, construction vehicles will cause an increase in traffic of less than 1 percent through I-84. This increase is expected to be inconsequential on the primary and alternate route. On the alternate route along US 97, construction vehicles will increase the ADT by up to approximately 1 to 5 percent, representing a low amount of traffic.

On the primary transporter route, peak construction trips will increase ADT volumes on US 197 by approximately 6 to 40 percent (less near The Dalles and greatest in Maupin). Given the increase in ADT on US 197 through Maupin, short-term delays may occur during construction, more likely when the maximum workforce is commuting to the Facility. The US 197 road segment with the greatest potential impact includes the Deschutes River Bridge and the east side of the Deschutes River where US 197 connects to Bakeoven Road. In this location, an approximately 0.5-mile section of US 197 and Bakeoven Road functions as a connection between the southern and northern portions of the Deschutes River Road (also known as BLM Access Road) that provides access to recreation opportunities in the canyon (see Exhibit T). This intersection was also identified as a

pinch point by the City of Maupin, with additional caution needed for cyclists in the area (Attachment U-3). Several measures listed below were developed with the City of Maupin's input to avoid significant impacts.

Along Bakeoven road, at its peak level, ADT may double with the combined traffic incoming from US 197 and US 97; however, given the lack of specific ADT information for Bakeoven Road (Section 3.3.2.6), the increase could be less. During construction of the 230-kV transmission line adjacent to Bakeoven Road (last 3 miles into the Bonneville Power Administration Maupin Interconnection Substation), short segments of one lane of traffic on Bakeoven Road may need to be temporarily closed over several weeks to a month to accommodate construction crews and equipment.

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 following measures as applicable:

- The temporary increase in the level of traffic should not interfere with harvest time activities such as tractor movement between fields or trucks delivery agricultural products to market. The Applicant will consult with landowners to minimize disruptions to ranching and farming operations due to construction activities such as equipment delivery;
- Providing proper road signage and warnings of "Equipment on Road," "Truck Access," or "Road Crossings;"
- Implementing traffic-diversion equipment (such as advance signage and pilot cars) whenever possible when slow or oversize loads are being hauled;
- Employing flag persons may be necessary to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents. Flag persons may facilitate two-way traffic on one lane by alternately restricting travel directions. This method will not require full lane closures, detours, or reroutes. Flag persons will also monitor through traffic on public roadways as necessary so that they are not in conflict with construction vehicles.
- Maintaining at least one travel lane at all times will be required so that roadways will not be closed to traffic due to construction vehicles entering or exiting public roads.
- The Applicant will avoid peak traffic times identified through consultation with Wasco County and the City of Maupin by adjusting scheduling of workforce shifts or other methods, such as requiring construction workers to check for congestion prior to leaving for the Facility to consider an alternate route. The City of Maupin indicated that traffic issues during peak tourist season, mid-June through early September, are likely avoidable if most construction workers passed through Maupin before 9 AM and after 4 PM (Attachment U-3).
- Conducting awareness training for all construction workforce drivers, including appropriate techniques for sharing roads with recreation users (especially cyclists and during peak tourist season mid-June through early September) and proper navigation of tight curves in and near Maupin.

The proposed measures listed above are intended to ensure that the Facility will avoid or minimize construction impacts to traffic. Additionally, the Applicant will use the detailed traffic count estimates described above and provided in Attachment U-1 to inform a transportation plan for the Facility, as requested by Wasco County in their comments on the Bakeoven Solar Project NOI (Wasco County 2019). Furthermore, while this analysis has conservatively assumed the entire 303-MW Facility would be constructed in one 12-month period, individual transportation plans will be developed for each of the proposed construction phases for the Facility (see Exhibit B). The phased construction schedule divides the total 303 MW over three to four years into approximately 60 MW constructed during 2021, 140 MW during 2022, and 103 MW during 2023-2024. While the actual division of MW will be based on final design for that phase, this approach may reduce the expected Facility-related traffic in any of the 12-month construction phases by as much as 50 percent. The transportation plans will be developed in consultation with the Wasco County Road Master, with input from the City of Maupin, ODOT, and Bureau of Land Management, to be completed prior to Facility construction. Based on this plan, the Applicant will enter into a Road Use Agreement with Wasco County for Facility construction and operation.

Therefore, with the above measures, development of transportation plans following a three to four-year phased construction approach, and a Road Use Agreement with Wasco County, no significant adverse traffic impacts are expected from construction of the proposed Facility.

Traffic and Design Standards

Traffic Standards

State highways are designed and constructed to accommodate 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 Wasco County Road Division and ODOT to determine whether any segments of roadway or bridges are restricted for travel, and to obtain any heavy haul permits required to allow transport of these loads. There are no permanent restrictions on state highways proposed for transporter routes. Because the state highways are built to accommodate overweight vehicles with permits, impacts to safety or roadway pavement conditions are not anticipated. Currently, the primary and alternate transporter routes have very good or good pavement conditions, with two segments of fair conditions (see above Section 3.3.2.6). From milepost 0.28 to 0.52, US 97 between mileposts 0.28 and 0.52 (Biggs Junction) on the alternate transporter route intended for large equipment requires permitting for loads wider than 18 feet, effective January 1, 2019. Vehicles up to 75 feet in length are allowed without special permitting on the primary and alternate transporter routes. The requirements imposed by Wasco County and ODOT effectively prevent significant impacts to traffic safety or maintenance needs along the transportation routes identified in this exhibit.

Design Standards

It is anticipated that county and local roadways will safely accommodate Facility construction traffic. In some cases, however, county and local roadways may require improvement before construction can begin. There are places on the proposed routes that will require improvements to accommodate new access road driveways and construction traffic. 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 Wasco County Road Master to ensure that any unusual damage or wear to state or county roads that is caused by construction of the facility is repaired by the Applicant. All county roads on the primary transportation route will be evaluated before 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 could include use of photographs, videotape, and engineer field notes to document road conditions. During construction of the Facility, the contractor will obtain authorization from Wasco County before proceeding with overweight loads on county-maintained roadways. The Applicant will strictly adhere to travel conditions and transportation equipment requirements set forth by either ODOT or Wasco County. Upon completion of construction, the Applicant will restore county roads to pre-construction condition or better, to the satisfaction of the County Road Division. 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 Wasco County's road system in as good or better quality than prior to the Facility's construction and will adhere to the transportation plan.

3.4.7.2 Operation Impacts

Operational traffic impacts associated with the Facility are not anticipated. Operational trips include employees traveling to work in their personal vehicles, as well as specialized personnel who may travel in light-duty trucks. As noted earlier, 5 to 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.

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.

3.4.8 Police Protection

Potential adverse impacts on the ability of communities to provide police protection could occur if the Facility itself resulted in 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 anticipated to create any significant concerns. During construction, the Applicant will provide on-site security and will establish good communications between onsite security personnel and the Wasco County Sheriff's Office. If needed, backup law enforcement will be available from the Oregon State Police Eastern Region, with offices in Madras, Prineville, and Bend. The estimated maximum 280 new temporary residents and the 3 to 5 new permanent residents are not anticipated to place significant new demands on the providers of police protection in the area and the Wasco County Sheriff has stated that they are able to respond to incidents and complaints at the site as they arise (Attachment U-4). Therefore, the Facility will not have a significant adverse impact on the ability of local communities to provide police protection or law enforcement services.

3.4.9 Fire Protection and Emergency Response

Potential adverse impacts on fire protection services could occur if Facility construction or operation or the increased population associated with either resulted in 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. The battery storage system also introduces an element that could pose a fire hazard. If lithium-ion batteries are selected, they 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 battery storage system will incorporate a fire response system as designed by the battery manufacturer. In addition, the following measures will be implemented for lithium-ion battery systems to minimize fire and safety risks:

- The battery systems will be stored in completely contained, leak-proof modules.
- An emergency response plan will also be developed with response procedures in the event of an emergency, such as a fire.
- Transportation of lithium-ion batteries is subject to 49 Code of Federal Regulations 173.185 – Department of Transportation Pipeline and Hazardous Material Administration. The regulations include requirements for prevention of a dangerous evolution of heat, prevention of short circuits, prevention of damage to the terminals, and require that no battery come in 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.

A statement from the Juniper Flat Rural Fire Protection District indicated that they had no concerns with Facility construction or operations with respect to providing fire protection services (see Attachment U-5). Due to the Facility location just outside of the eastern boundary of the Juniper Flat Rural Fire Protection District, a contractual agreement with a Fire Plan will need to be implemented to provide 24-hour, 7 days a week emergency service. Additional support is available from other

nearby fire protection districts including the newly formed Bakeoven-Shaniko Rangeland Fire Protection Association. Steps that will be taken to prevent fires during construction will include establishing roads before accessing the site to keep vehicles away from grass, using diesel vehicles whenever possible (to prevent potential ignition by catalytic converters), avoiding idling vehicles in grassy areas, keeping cutting torches and similar equipment away from grass, and development of a health and safety plan.

The relatively small number of new temporary residents and new permanent residents are not anticipated 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.

3.4.10 Health Care

Potential impacts on 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 routine and emergency health care services that exceeded the capacity of local providers. However, due to the relatively small number of new temporary residents and new permanent residents, significant new demands are not expected from health care facilities that serve the area. Therefore, no significant adverse impact on the ability of communities to provide health care is anticipated as a result of Facility construction or operation.

3.4.11 Schools

Because construction work for the Facility will be short-term and therefore few workers will be bringing their families with them, few if any students are anticipated in association with Facility construction. Therefore, little to no construction-related impacts on schools will result.

Assuming that up to 5 new permanent households result from the Facility, an estimated maximum of 10 new schoolchildren (assuming 2 children per household) could move to the analysis area. A total of 688 students are currently served at the five schools in the analysis area. The schools can accommodate the addition of 10 students or slightly more than a 1 percent increase. Therefore, facility operation is not anticipated to have an adverse impact on schools.

No demand for school facilities is anticipated during Facility construction, and only minimal demand is anticipated from the small increase in local population from new permanent employees during Facility operations. Actual impacts on schools will depend on the housing choices of new residents with children, which is unknown. Given the relatively dispersed area in which new residents are likely to settle, the relatively small number of anticipated new schoolchildren, and the number of schools available, it is unlikely that any one school will receive more new students than could be accommodated. As a result, no significant adverse impacts on the ability of communities to provide school services are anticipated as a result of Facility construction or operation.

3.5 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 3.3 to provide services in the analysis area. Therefore, a monitoring program is not proposed.

4.0 Conclusion

This exhibit provides the required information pursuant to OAR 345-021-0120(1)(u) and approval standard OAR 345-022-0100. 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.

5.0 Submittal Requirements and Approval Standards

5.1 Submittal Requirements

Table U-5. 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 shall include:	–
(A) The important assumptions the applicant used to evaluate potential impacts.	Section 3.2
(B) Identification of the public and private providers in the analysis area that would likely be affected.	Section 3.3
(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 3.4
(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.	Section 3.4
(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 3.5

5.2 Approval Standards

Table U-6. Approval Standard

Requirement	Location
OAR 345-022-0100 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.	–

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Figures

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Bakeoven Solar Project

Figure U-1
Analysis Area

WASCO COUNTY, OREGON

- Proposed Site Boundary
- Proposed Micrositing Corridor
- Analysis Area (10-mile Buffer)

Basemap Features

- City/Town
- US Highway
- State Highway
- Local Road
- County Boundary

Tygh Valley
Maupin
Bakeoven Rd
Kent
Wilson Rd
Bakeoven Rd
Shaniko
Gilliam County
Sherman County
Sherman County
Wasco County
216
97
197
218

1:200,000 WGS 1984 UTM Zone 10N

0 2.5 5 10 15 20 Miles

NOT FOR CONSTRUCTION

TETRA TECH

AVANGRID RENEWABLES

Data Sources	Reference Map
Avangrid-Project Infrastructure; USDA-Aerial Imagery; Census Bureau-Tiger Roads	

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Bakeoven Solar Project

Figure U-2
Primary Construction Transportation Routes

WASCO COUNTY, OREGON

- Proposed Site Boundary
- Proposed Micrositing Corridor
- Primary Transporter Route
- Alternate Transporter Route

Basemap Features

- City/Town
- Interstate Hwy
- US Highway
- State Highway
- Local Road
- County Boundary
- State Boundary

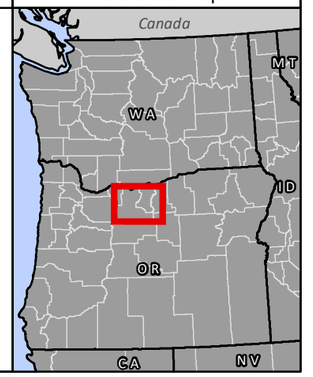
TETRA TECH

AVANGRID RENEWABLES

Data Sources

Avangrid-Project Infrastructure; USDA-Aerial Imagery; Census Bureau-Tiger Roads

Reference Map



Mosier
Wilson Rd
Klickitat County
Wasco County
Washington
Oregon
Sherman County
Gilliam County
Wasco
Moro
Dufur
Grass Valley
Condon
Hood River County
Wasco County
Maupin
Bakeoven Rd
Wilson Rd
Shaniko
Sherman County
Wasco County
Gilliam County
Wheeler County
Fossil
Antelope
282
37
281
35
30
197
216
206
97
19
26
218
293

1:350,000 WGS 1984 UTM Zone 10N

0 2.5 5 10 15 20 Miles

NOT FOR CONSTRUCTION

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Attachment U-1. Bakeoven Solar Traffic Report (Westwood 2019)

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Westwood

TRAFFIC COUNT PLAN

Bakeoven Solar Project

Wasco County, Oregon

March 2019

Prepared For:

Avangrid Renewables, LLC
1125 NW Couch St, Suite 700
Portland, OR 97209

Westwood

Traffic Count Plan

Bakeoven Solar Project

Wasco County, Oregon
Project Number: 00219706.00
Date: 03/29/2019

Prepared for:

AVANGRID RENEWABLES

Prepared by:

Westwood

CONTENTS

EXHIBITS

1.0 INTRODUCTION

The Bakeoven Solar project is proposed as up to a 303MW-AC solar PV array with associated access roads, collection system, transmission system, battery storage system, staging yards, and substation location. The construction of the Bakeoven Solar project will generally require mainly conventional and a few specialized transportation vehicles, including construction worker personal vehicles. The exact number of construction vehicles has not been determined but the majority of the deliveries will not require oversized/overweight delivery vehicles. The only anticipated oversized delivery will be the substation main power transformers (MPTs).

The scope of this report is to determine the total number of trucks entering the project site from public roads and calculate the approximate peak traffic entering the site from public roads. Trips are summarized as one-way trips. Trips for both the delivery and removal of equipment and field offices are shown.

2.0 TRAFFIC PROJECTION

Traffic entering the project site will include construction workers, materials delivery, and equipment delivery. Most traffic will reach the site from Interstate 84/US 30 at the east end of the Dalles, Oregon, using US 197 to Maupin, Oregon, and then Bakeoven Road, east, then southeast to access the arrays, substation, and operations and maintenance facility. A portion of the traffic will use US 97 from Interstate 84/US 30 at Biggs Junction, Oregon to Bakeoven Road, west of Shaniko. Some of the workers may commute from south of the project using US 97 from the Madras and Redmond areas. Bakeoven Road runs north northwest to access the project. The route following US 97 is longer than the route following US 197, but it avoids Maupin where there may be tourist traffic during the summer. Project traffic using US 197 would go through the town of Maupin, and there are several switchbacks in and around Maupin that construction traffic would need to negotiate. These tight curves are on both US 197 and Backoven Road, west of the project. Project traffic using US 97 would be routed through the small towns of Moro, Grass Valley, Kent, and Shaniko, Oregon. These towns are smaller than Maupin and the highway impacts a smaller number of buildings. See Exhibit 1.

The highest existing average daily traffic (ADT) on any of these roads is 3900 vehicles per day, which occurs on US 197 in The Dalles. This section has a calculated volume to capacity ratio of 0.11, based on 350 vehicles in the peak hour. So there is adequate capacity to accommodate construction traffic. In Maupin, US 197 has an ADT of 1100, only one third of the traffic in The Dalles. However, because of the sharp curves, steep grades, low speed, and multiple intersections the capacity in Maupin is less than the capacity in The Dalles. The ADT on US 97 near the project is 2700. No figures for traffic volume were available for Bakeoven Road. Other County Roads in rural areas with characteristics similar to Bakeoven Road have ADTs of less than 300.

With the exception of the substation MPTs, the overhead collection system poles, and the transmission line poles, all vehicles are expected to be standard highway trucks and light-duty

vehicles, such as pickup trucks; in contrast with the wind farm construction that occurred on an adjacent site. US 97 is the preferred route for delivery of the MPTs and the two types of transmission poles since it avoids small radius curves and the town of Maupin, even though it is approximately 17 miles longer than US 197 if the delivery originates west of the project.

After construction of the solar farm, operations and maintenance traffic will be limited to a few passenger vehicles per day.

There are numerous quarries and aggregate pits on US 197, US 97, and Bakeoven Road. These aggregate sources are north and south of the project area. One pit is located at the southeast edge of the project on Bakeoven Road. Aggregate can likely be sourced so that the aggregate haul route does not impact Maupin. The project will likely require an on-site batch plant for concrete. There are several potential sites within the footprint of the project, so no concrete delivery traffic would use public roads other than Bakeoven Road. This traffic projection assumes the Bakeoven Wind batch plant will be the source of concrete for the solar project. All other materials will likely be transported to the site using Interstate 84/US 30 from either the west (Port of Vancouver) or from the east. For any components arriving from the east US 97 is the preferred route.

The project will employ an estimated 500 construction workers. During the short peak period there may be up to 400 workers, with the average number of workers in the range of 250. The estimate was developed using a construction estimate based on time and materials using crew and productivity data from RS Means. The total number of trips was determined by using the number of employees in each of the categories listed above; dividing that number by an estimated vehicle occupancy, (2.0 for survey crews, and 1.5 for all other categories); and multiplying by the number of work days for each employee category. The estimated number of work days for each category are: 200 days for survey; 250 days for construction trades; 250 days for project management staff; and 240 for equipment operators.

General summaries of the construction work tasks and related delivery and construction vehicles are listed below.

3.0 WORK TASKS

Work Tasks are generally listed in chronological order, but extensive overlap can be expected depending on the contractor scheduling.

- Survey project site and set construction stakes
- Install and maintain erosion and sediment control
- Grade Field Office location and place aggregate
- Deliver and Install Field Office trailers
- Grade Staging Areas and place aggregate surface
- Improve Public Roads
- Construct internal access roads – grade and place aggregate

- Erect security fencing – enclosing arrays and facilities
- Place foundation piles
- Assemble solar array racking
- Mount PV modules
- Connect DC wiring
- Grade Equipment Pad Areas
- Construct foundations for equipment pads/skids
- Place and connect inverter/transformer, electrical components and SCADA system
- Trench Collector System (MVAC)
- Construct O&M Facility
- Install overhead collection line
- Install transmission line
- Grade substation area
- Construct substation equipment and main power transformer foundations
- Install substation equipment
- Place substation aggregate
- Connect substation to transmission line
- Grade Battery Storage System Area
- Construct Battery Storage System Foundation
- Install Battery Storage System Equipment
- Connect Battery Storage System to Substation
- Place Battery Storage System Aggregate
- Test and commission equipment
- Remove field offices, security fencing, and aggregate
- Remove staging area security fences and aggregate
- Restore, revegetate and remove temporary erosion and sediment control

4.0 CONSTRUCTION EQUIPMENT

Examples of the types of equipment generally used in solar farm construction:

- Survey – one pick-up truck for each 2 person crew
- Erosion and sediment control – Silt fence trenchers
- Grading (field office location, staging areas, access roads, O&M facility, substation, and battery storage system area) – medium bull dozers, compaction rollers, and water trucks
- Public road improvements – Road grader, compaction rollers, water trucks
- O&M facility – back hoe, small crane
- Materials handling equipment – rough terrain fork lift, small flat-bed trailers pulled by pick-up trucks, mobile cranes
- Security fencing – skid-steer with auger attachment, and hydraulic post driver attachment, and hand tools for each crew
- Foundation piles – tracked pile driver
- Array racking – hand tools
- PV modules – hand tools

- DC wiring – hand tools
- MVAC underground collector trenching – specialized trenching equipment, cable plows, and back hoes, cable reel trailers
- MVAC overhead collection line – backhoe with auger attachment, specialized pole setting equipment (boom trucks), bucket trucks, cable reel trailers
- Transmission Line – backhoe with auger attachment, specialized pole setting equipment (boom trucks), bucket trucks, cable reel trailers
- O&M and Equipment foundations – back hoe
- Inverter/transformers and electrical skids – truck mounted or mobile hydraulic crane
- Substation construction – bull dozer, backhoe, compaction roller, water trucks, mobile hydraulic crane, large crane (MPT)
- Battery Storage System construction – bull dozer, backhoe, compaction roller, water trucks, mobile hydraulic crane
- Substation to interconnect transmission line – foundation auger mounted on back hoe, mobile hydraulic crane
- O&M Building – mobile hydraulic crane
- Removal of temporary aggregate (field office location and staging areas) – Front end loader
- Revegetation and removal of erosion and sediment control – chisel plow (decompaction), small tractor and tilling equipment, skid steer loader, hydro seeding/hydro-mulching equipment

5.0 MATERIALS

Examples materials used in the construction of solar farms:

- Silt fence, bio log, and other erosion and sediment control materials
- Aggregate (public road improvement, access roads, staging areas, operations and maintenance facility, substation, battery storage system)
- Security fencing (field office location, staging areas, solar arrays, substation, battery storage system)
- Field Offices and storage trailers
- Foundation Piles (solar array)
- Solar Array Racking (tracker system)
- PV modules
- Collection system wiring (dc and ac – underground and overhead)
- Concrete for solar piles, equipment foundations (one for each 2 MW ac)
- Formwork for foundations (Equipment pads, O&M, substation transformers and equipment, battery storage system
- Rebar for above concrete foundations
- Concrete for O&M facility foundation
- Concrete for substation foundations (Main Power Transformer (MPT), electrical equipment, and control building)
- Concrete for battery storage system foundations
- O&M Building materials

- Electrical equipment (Inverter/transformers, switch gear, circuit breakers, junction boxes, conduit, SCADA)
- Structural steel for substation racking
- Structural steel poles for overhead collection line and transmission line
- Main power transformer
- Transmission line cables
- Battery Storage System
- Water for aggregate/backfill compaction and dust control
- Miscellaneous consumables
- Seed and mulch

6.0 MATERIAL DELIVERY VEHICLES

Types of vehicles used for material deliveries:

- Single Unit Flatbed Trucks - Erosion and sediment control materials, seed and mulch, miscellaneous consumables
- Gravel Semi-Trailer Dump Trucks with a 16 cubic yard load capacity (loose volume) with an approximate gross vehicle weight of 80,000 pounds and a load weight of approximately 40,000 pounds.
- Field office trailers
- Concrete Trucks- with a 10 CY capacity, weighing approximately 69,000 pounds
- Semi-Trailer Flat Bed – Steel foundation piles, solar array racking, security fence, concrete forms, rebar, O&M building components, inverter/transformers, electrical equipment for inverter equipment pads, structural steel for substation, electrical equipment for substation, - Non-permit load size 8'-6" x 8'-6" x 48'-0", gross vehicle weight 80,000 pounds, up to 45,000 pound load
- Forty Foot Container Trucks – PV modules – Semi-trailer, 572 PV modules (according to Jinko Solar specification sheet)
- Forty Foot Container Trucks – Storage Batteries – Semi-trailer, 5 MWh per container
- Cable trailers – low voltage dc, MVAC underground, MVAC overhead, overhead transmission
- Distribution and Transmission Line Pole trailers
- Water trucks – 4000 gallon capacity, single unit tank trucks, weighing approximately 59,000 pounds
- Lowboy Multi-Axel Trailer - Main power transformer, substation control building
- Workers' trucks (Pick-up trucks –average 1.5 occupants)

7.0 EQUIPMENT DELIVERY VEHICLES

Types of vehicles used for the delivery of construction equipment:

- Lowboy semi-trailer – Bull dozers, compaction rollers, back hoes, mobile cranes, skid steer loaders, tracked pile drivers, cable trenchers, cable plows, agricultural plows
- Single unit flatbed truck – Hydro much/hydro-seed equipment
- Small flatbed trailers towed behind pick-up trucks for small equipment and tools

8.0 CONSTRUCTION

Construction of solar farms requires that a few tasks be repeated across the project site. Some sequencing of tasks is required, but many tasks may overlap across the site for efficient scheduling. The exceptions are construction of the operations and maintenance facility, substation, battery storage system, and the transmission line which are not constrained by precedent activities.

9.0 SCHEDULE

For the purpose of determining the daily volume of traffic, construction time is assumed to be nine to twelve months. Solar farm sites are large and allow many crews to work simultaneously without interfering with one another. The size of the project may not impact the construction time significantly because only a few of the required tasks must be performed sequentially, and the labor and equipment can scale for large projects.

10.0 SUMMARY:

Exhibit 2 shows types and number of vehicles expected for the construction of the Bakeoven Solar Project. The design of the project is preliminary, so material quantities are based on; scaling kmz files in Google Earth, scaling preliminary design pdf files, and using ratios of: foundation piles; array racking; PV modules; and wire and cable, per megawatt (MW) calculated from previous solar project designs. The specific assumptions for each line item are shown in the Notes/Assumptions column.

Based on a time and materials analysis we project that the project will employ approximately 500 individuals at some time during the project, and the project will generate approximately 78,700 trips each way. Since not all of the work tasks occur at the same time the peak work force should be approximately 400, with this peak being relatively short based on preliminary schedule. The average work force will be approximately 250 workers. Approximately 45,000 of the total trips are commuting trips by the construction workers and project management staff. Aggregate deliveries are responsible for the largest portion of the material trips, and these trips may be limited to within the project area. Construction equipment deliveries account for a small number of the trips.

Bakeoven Road will see the largest number of trips as delivery of aggregate, concrete, and water may originate within the length of Bakeoven Road. US 197 will likely carry vehicles that are not over-weight or oversized. Such vehicles may be restricted to US 97 as a delivery route. Construction workers may find housing in several of the small towns on both US 197 and US 97. Maupin, Tygh Valley, Dufur, and the larger town of The Dalles are located on US 197. Grass Valley, Moro, Wasco, and Shaniko are located on US 97 north of the project. Madras and Redmond are located on US 97 south of the project. Based on the relative sizes of these towns this traffic estimate uses 70 percent of the construction worker traffic using US 197, 20 percent using US 97 to the north of the project, and 10 percent using US 97 to the south of the project.

Based on a project duration of approximately 250 work days, peak vehicle counts will be approximately 375 trips each way per day, with the highest hourly volume of approximately 266 vehicles per hour during the morning and afternoon peaks. The 266 trips in the peak hour are confined to Bakeoven Road. US 197 and US 97 will have lower volumes of traffic.

US 197 is projected to have approximately 166 trips in the peak hour. Despite the steep grades in and around Maupin construction traffic is not likely to create traffic delays.

US 97 (north) of the project is projected to have approximately 46 trips in the peak hour.

US 97 (south) of the project is projected to have approximately 23 trips in the peak hour.

Exhibit 2 - Bakeoven Solar Project - Estimated Vehicle Trips

Vehicles	Number of Trucks	Estimated Gross Vehicle Weight (Pounds)	Load Weight (Pounds)	Notes/ Assumptions
Pick-Up Trucks				
Survey	1,000	7,000	500	
Construction Trades	31,875	7,000	500	Average number of crews (85)
Project Management Staff	5,000	7,000	500	Includes inspectors
Equipment Operators	7,040	7,000	500	
Small Equipment on Flatbed Trailer	50	12,000	5,000	
Total Pick-up Truck Trips	44,965	35,972	8,993	Assume 70% US 197, 20% US 97 (north), & 10% US 97 (south)
Peak Number of Pick-up Truck Trips/Day	229	161	46	Assume 70% US 197, 20% US 97 (north), & 10% US 97 (south)
			23	Assume 70% US 197, 20% US 97 (north), & 10% US 97 (south)
Mobile Home (Field Office)	22	60,000	40,000	1 Field Office Trailer (Civil) - 40' x 12'
				3 Field Office Trailers for Subs - 12- x 36' Triple Wide
				1 Field Office Trailer (Tracker) - 40' x 12'
				6 Storage Trailers
Flatbed Semi Tractor Trailer				
Equipment				
Bulldozer	6	50,000		Cat D6
Drum Compactor	6	41,000		Cat CS41B
Rough Terrain Fork Lift/Telehandler	3	37,000		Manitou MHT 10120: 26,000 pound capacity
Skid Steer Loader	9	4,000		Cat 272D2
Tracked Pile Driver	9	12,000		Vermeer PD10
Trenching Equipment/Cable Plows	5	52,000		Wolfe 7000
Backhoe Loader	3	24,000		Cat 415F2
Mobile Hydraulic Crane/Truck Mounted Crane	3	28,600		Shuttle Lift 15 ton crane
Equipment Operators	44			
Materials				
Erosion and Sediment Control Materials	2	45,000	10,000	Based on 50,000 feet of perimeter control
Public Road Aggregate	145	80,000	40,200	Based on 4832 feet of public road improvements, 6" depth
Access Road Aggregate	4,224	80,000	40,200	Based on 25 miles of new access roads
Staging Area Aggregate	2,884	80,000	40,200	Based on three staging areas totaling 33 acres
Substation Aggregate	229	80,000	40,200	Based on a 3.5 acre substation
O&M/Field Office Aggregate	229	80,000	40,200	Based on a 3.5 acre O&M/Field Office Area
Battery Storage System Aggegate	721	80,000	40,200	Based on an 11 acre battery storage system
Total Aggregate for Compaction Deliveries	8,433	171,359	Tons	Assume all trips on Bakeoven Road only

Exhibit 2 - Bakeoven Solar Project - Estimated Vehicle Trips

Substation Rock	229	80,000	40,200		Based on a 3.5 acre substation
Field Office/O&M Rock	229	80,000	40,200		Based on a 3.5 acre O&M/Field Office Area
Battery Storage System Rock	721	80,000	40,200		Based on an 11 acre battery storage system
Concrete Aggregate	2,814	80,000	40,200		Based on Aggregate equal to 76% of weight
Total Aggregate Deliveries	12,427	267,955	Tons		Assume all trips on Bakeoven Road only
Foundation Piles	526	80,000	45,000		Based on pile spacing of about 21 feet, 8/per rack
Array Racking	705	80,000	45,000		Based on ten pound per foot for 951,900 modules
PV Panels	1,664	63,371	28,371		Based on Jinko 380 watt panels
Wire and Cable - Collection System	32	80,000	45,000		Based on 4000 pounds per MW
Wire and Cable - Overhead Collection System	3	80,000	45,000		Based on 3 conductors, 2.1 pounds
Wire and Cable - Transmission Line	12	80,000	45,000		Based on 3 conductors, 2.6 lbs/Ft, 2 Guard Wires, 1 lbs/Ft
Overhead Collection Line Poles	23	30,000	15,000		Assume 250' wire span, 4 - 2000 pound Poles per trailer
Transmission Line Poles	77	27,000	12,000		Assume 750' wire span, 1 - 8000 pound Pole per trailer
Equipment Skids	151	80,000	45,000		Based on 2 MW inverters with 2 blocks per skid
Formwork	4	80,000	45,000		
Reinforcing Steel (Rebar)	7	80,000	45,000		Based on 100 lbs/CuYd of concrete except pile foundations
Total Array Related Deliveries	3,204				Assume all deliveries on US 197
Concrete for Piles	6,769	49,000	20,000		Based on 0.20 CuYds/pile - Load controlled by discharge time
Concrete for Inverter Skids	151	69,000	40,000		Based on Foundation 8'-6" x 24'-0" x 1'-4"
Concrete for Substation Foundations	41	69,000	40,000		Based on 2 MPT - Foundation 8'-6" x 24'-0" x 1'-4"
Concrete for Battery Storage System Foundations	100	69,000	40,000		Based on 40' container each with 6 foundation pies
Concrete for Overhead Collection System Pole Foundations	12	69,000	6,090		Assume 1 concrete foundations (terminations & angles)
Concrete for Transmission Line Pole Foundations	11	69,000	28,420		Assume 11 concrete foundations (terminations & angles)
Concrete for O&M Building	12	69,000	40,000		Based on foundation wall 100' x 50' 1' thick x 5' deep plus 4" floor s
Total Concrete Deliveries	7,096	37,065	CuYds		Assume all trips on Bakeoven Road only
Cement for Concrete Batch Plant	602	80,000	40,000		Based on Aggregate equal to 16% of weight
Building Materials	20	80,000	45,000		Based on 5000 square foot prefabricated metal building
Structural Steel - Substation	4	80,000	45,000		Based on 200,000 Pounds of Structural Steel
Elecrical Equipment - Substation	10	80,000	45,000		Includes Control Building, switch gear, capacitors, etc.
Battery Storage System	100	80,000	54,000		Based on 100MW/300MWh - 40' container each
Chain Link Fence	50	80,000	45,000		Based on 212,000 linear feet of fence at 10.65 pounds/ ft
Micellaneous Consumables	26	60,000	20,000		
Seed and Mulch	965	52,600	12,800		Based on 2.5 tons/acre of array
Total Miscellaneous Deliveries	1,778				Assume all trips on US 197

Exhibit 2 - Bakeoven Solar Project - Estimated Vehicle Trips

Water (Compaction)		857	59,000	33,400	Based on 20 gallons/ton of aggregate (Roads, staging
Water (Dust Control)		1,632	59,000	33,400	Based on 300 gallons/acre/day of Road, staging, and field office are
Water (Vegetation establishment)		6,178	59,000	33,400	Based on 10,000 gallons/acre of array
Water (Concrete Batching)		360	59,000	33,400	Based on Aggregate equal to 8% of weight
	Total Water	9,026	36,108,032	Gallons	Assume all trips on Bakeoven Road only
Sanitation		52	50,000	10,000	Based on weekly maintenance visits
Total Material Deliverty Trucks		33,607			
Average Material Deliverty Trucks/Day		146		230	Assumed Days of Deliveries
Lowboy Delivery Vehicle (Additional Axles)					
Equipment		Number (Delivery and Removal)			
Bulldozer		12	90,000	50,000	
Drum Compactor		12	80,000	41,000	
Rough Terrain Fork Lift/Telehandler		6	72,000	37,000	
Skid Steer Loader		18	19,000	4,000	
Tracked Pile Driver		18	32,000	12,000	
Trenching Equipment/Cable Plows		10	90,000	52,000	
Back Hoe Loader		6	49,000	24,000	
Mobile Hydraulic/Truck Mounted Cranes		6	63,600	28,600	
Fuel Deliveries		50	26,000	7,000	Based on 1000 Gallons/week ea. of diesel on-road & off road
	Total Number of Equipment Delivery Trips	138			Trips concentrated at beginning and end
Oversize/Over Weight Materials					
Main Power Transformer		2	200,000	125,000	13 Axle Vehicle - 2 - 160 MVA Transformers
Total Number of Project Trips (each way)		78,734			

Exhibit 2 - Bakeoven Solar Project - Estimated Vehicle Trips

Approximate peak number of daily trips (each way)	375	
Approximate peak number of daily trips on US 197 (each way)	182	Trips are also on Bakeoven Road
Approximate peak number of daily trips on US 97 (each way-N)	46	Trips are also on Bakeoven Road
Approximate peak number of daily trips on US 97 (each way-S)	23	Trips are also on Bakeoven Road
Approximate peak number of daily trips on Bakeoven Rd	375	
Approximate Average Daily Traffic (ADT)	750	
Approximate peak number of daily trips on US 197	364	Trips are also on Bakeoven Road
Approximate peak number of daily trips on US 97 (north)	92	Trips are also on Bakeoven Road
Approximate peak number of daily trips on US 97 (south)	46	Trips are also on Bakeoven Road
Approximate peak number of daily trips on Bakeoven Rd	750	
Approximate Peak Hour Volume (AM and PM)	266	
Approximate Peak Hour Volume (AM and PM) on US 197	166	Trips are also on Bakeoven Road
Approximate Peak Hour Volume (AM and PM) on US 97 (north)	46	Trips are also on Bakeoven Road
Approximate Peak Hour Volume (AM and PM) on US 97 (south)	23	Trips are also on Bakeoven Road
Approximate Peak Hour Volume (AM and PM) on Bakeoven Rd	243	

Attachment U-2. Record of Correspondence with the Wasco County Landfill

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From: Jocelyn Jones
To: Gulick, Kristen
Subject: Re: RESPONSE NEEDED - Wasco County Landfill"s Agreement with Bakeoven Solar Project
Date: Wednesday, December 19, 2018 8:20:30 AM

Good morning Kristen,
Wasco has options to expand its current footprint that would extend the life of the landfill past 45 years. So a quick answer would be yes we can accommodate material for 50 years

Jocelyn

On Dec 19, 2018, at 8:08 AM, Gulick, Kristen <Kristen.Gulick@tetratech.com> wrote:

> Hi Jocelyn,
> Thanks again for your quick reply. I have a follow up question about the ability of Wasco County Landfill to accommodate the project's waste needed. The project could last as long as 50 years, that is including retirement and decommission. You say that 45 years is projected for the landfill's current footprint. With the landfill have the ability to accommodate those remaining 5 years? Any feedback would be greatly appreciated.
>
> Thank you!
>
> **Kristen Gulick** | **Environmental Planner**
> Kristen.Gulick@tetratech.com
>
> **CHRISTMAS SCHEDULE – OUT 12/21 through 1/1/19!**
> **Part-time Schedule: Monday – Thursday, Fri AM if needed**
>
> **Tetra Tech | Portland**
> 1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
> Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316
>
>
>
> 
> **Think Green - Not every email needs to be printed.**
>
> ---
>
> **From:** Jocelyn Jones <Jocelyn.Jones@WasteConnections.com>
> **Sent:** Tuesday, December 11, 2018 11:39 AM
> **To:** Gulick, Kristen <Kristen.Gulick@tetratech.com>
> **Subject:** RE: RESPONSE NEEDED - Wasco County Landfill's Agreement with Bakeoven Solar Project
>
> Good Morning Kristen,
>
> Wasco County landfill has the ability to receive this waste referenced. Wasco's is projecting 45 years left in its current footprint at the landfill.

Jocelyn Jones | Landfill Sales
Wasco County and Finley Buttes
Western Region – Waste Connections
501 SE Columbia Shores Blvd. Ste 350 Vancouver, WA 98661
Mobile: 360.936.0386|jocelynr@wcnx.org

<image001.jpg> <image002.jpg>

From: Gulick, Kristen [mailto:Kristen.Gulick@tetratech.com]
Sent: Monday, December 10, 2018 2:30 PM
To: CUSTOMERSERVICE2042
Cc: SpecialWaste2042
Subject: RE: RESPONSE NEEDED - Wasco County Landfill's Agreement with Bakeoven Solar Project

Something to add,

To perhaps give more background, Tetra Tech is under contract to Bakeoven Solar, LLC (Bakeoven) 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 support for the construction of the facility. At this point in the process, Bakeoven is not required to have entered into a contract with the Wasco County Landfill, we just need to demonstrate to ODOE that we have been in consultation with the Wasco County Landfill and that yes, you are able to provide waste support to Bakeoven, as well as any constraints you may have. Any letter from you to me on this subject does not constitute a contract and you are under no obligation to provide waste support for the facility.

Thank you again for your time!

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

CHRISTMAS SCHEDULE – OUT 12/21 through 1/1/19!
Part-time Schedule: Monday – Thursday, Fri AM if needed

Tetra Tech | **Portland**
1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316

From: Gulick, Kristen
Sent: Friday, December 7, 2018 4:29 PM
To: 'customerservice2042@wcnx.org' <customerservice2042@wcnx.org>
Cc: 'specialwaste2042@wasteconnections.com' <specialwaste2042@wasteconnections.com>
Subject: RESPONSE NEEDED - Wasco County Landfill's Agreement with Bakeoven Solar Project

Hello,
I am contacting you on behalf of the Bakeoven Solar Project, which you may have already heard about from the developer of the project, Brian Walsh.

The Applicant proposes to construct and operate a photovoltaic solar energy generation facility and related or supporting facilities in Wasco County, Oregon. The proposed Bakeoven Solar Project will consist of up to 303 megawatts of solar generation and include a battery storage system capable of storing up to 100 MW of energy. The Facility will generate electricity using PV solar panels wired in series and in parallel to form arrays and connected to electrical infrastructure.

Based on the location of the Bakeoven Solar Project in Wasco County (see attached for proposed location) we request a formal confirmation that the Wasco County Landfill will have the adequate capacity to handle a rough estimate of 40cy per week of construction waste generated by the facility over the course of 9 to 12 months construction time. General construction materials, no hazmat waste. We are aware that the Wasco County Landfill expanded its capacity in 2001 and currently has a solid waste disposal permit that is valid until 2024.

This agreement can be in the form of 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.

If you could please confirm that the above agreement is accurate as soon as you can, that would be greatly appreciated. This is a very quick project turn-around.

Thanks so much,

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri AM if needed

Tetra Tech | **Portland**
1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316

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Attachment U-3. Record of Correspondence with City of Maupin, Mayor's Office

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Bakeoven Solar Project
City of Maupin – Traffic Considerations
Phone Call

March 13, 2019

Attendees

- **City of Maupin, Mayor** – Lynn Ewing
- **Tetra Tech** – Anneke Solsby

Call Purpose and Summary:

The purpose of the call was to gather preliminary, high-level, traffic and transportation related information for the City of Maupin in consideration of Project development. Mayor Ewing provided a general overview of the key traffic characteristics for the City of Maupin.

Key Highlights:

- Traffic is nonexistent most of the year, but summers are busier.
- There are only 430ish people in town, but in the summer over 100,000 visitors.
- Traffic is heavier on the weekend during the summer.
- Traffic is heaviest from 9-11 and 2-4pm. During these times, traffic is still moving just slower and busier.
- The intersection of US197 and Bakeoven is the pinchpoint.
- There are cyclists in the area including on Bakeoven Road and on roads with river access.
- There are cycling events on Bakeoven Road and in the area 2/3 times a year.
- If most construction workers passed through before 9am and after 4pm, the times of highest traffic volume would be avoidable.
- Tourists mannerisms such as tourists do silly things (e.g. walking in the middle of the road) should be considered.
- Later in the summer, there may be large farm vehicles such as combines in the area.
- There are occasional cattle drives on Bakeoven Road.
- The Dalles may be where most construction workers come from. Mr. Ewing suggested carpools may help to reduce the amount of construction worker vehicles passing through.

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Attachment U-4. Record of Correspondence with the Wasco County Sherriff's Office

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SHERIFF'S OFFICE

511 Washington St., Ste.102 • The Dalles, OR 97058
p: [541] 506-2580 • f: [541] 506-2581 • www.co.wasco.or.us

Pioneering pathways to prosperity.

To: Kristen Gulick
Tetra Tech
1750 SW Harbor Way, Suite 400
Portland, OR 97201

December 11th 2018

Re: Bakeoven Solar Project

To whom it may concern:

The Wasco County Sheriff's Office has been made aware of the Bakeoven Solar Project. Based on the location of the site the Wasco County Sheriff's Office will have the ability to respond to incidents and complaints at the site as they arise. It should be noted the aforementioned site will receive services based on constraints of call loads and other priority incidents throughout the county. Emergency calls for service at the site will be prioritized with other related calls.

This letter of response does not commit/obligate the Wasco County Sheriff's Office to provide on-site security, and only provides for the investigation(s) of criminal activity (e.g. theft, trespassing, criminal mischief, etc.) related to the site.

Sincerely,

Lane Magill
Wasco County Sheriff

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Attachment U-5. Record of Correspondence with the Juniper Flat Rural Fire Protection District

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JUNIPER FLAT
RURAL FIRE PROTECTION DISTRICT

80501 Hwy 216, Maupin, Oregon 97037
541-328-6388

Kristen Gulick | Environmental Planner
Tetra Tech
1750 SW Harbor Way, Suite 400
Portland, OR 97201
Direct: 503.721.7216 x 2241
Cell: 541.740.3316
Kristen.Gulick@tetratech.com

RE: Bakeoven Solar Project

Kristen Gulick representing Tetra Tech of Portland has consulted Chief, Eugene Walters of Juniper Flat Rural Fire Protection District (JF RFPD) regarding the Bakenoven Solar Project. JF RFPD does have the ability and equipment to respond to fire and other emergencies incidents at the project site. However due to the Bakeoven Solar Project is outside of the eastern boundary of the JF RFPD District, a contractual agreement with an emergency plan would need to be in place to provide 24 hours 7 days a week emergency services.

~ Eugene H. Walters

Eugene H. Walters ~ Fire Chief
Juniper Flat Rural Fire Protection District
80501 Hwy 216
Maupin, Oregon 97037
Office 541-328-6388
Cell 541-980-8241
Eugene@JuniperFlatRFPD.com

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