

# EXHIBIT U

## PUBLIC SERVICES/SOCIOECONOMIC IMPACTS

OAR 345-022-0010(1)(u)

### TABLE OF CONTENTS

	Page
U.1 ASSUMPTIONS USED TO EVALUATE POTENTIAL IMPACTS .....	U-1
U.1.1 Employment .....	U-1
U.1.1.1 Construction .....	U-1
U.1.1.2 Operations .....	U-2
U.1.2 Population and Housing .....	U-2
U.1.2.1 Construction .....	U-2
U.1.2.2 Operations .....	U-2
U.1.3 Transportation .....	U-2
U.1.3.1 Transportation Routes .....	U-2
U.1.3.2 Truck Traffic .....	U-3
U.1.3.3 Points of Origin .....	U-3
U.1.4 Sewers and Sewage Treatment .....	U-3
U.1.5 Water .....	U-4
U.1.6 Stormwater Drainage .....	U-4
U.1.7 Solid Waste Management .....	U-4
U.1.8 Police and Fire Protection .....	U-4
U.1.9 Health Care .....	U-4
U.1.10 Schools .....	U-4
U.2 PUBLIC AND PRIVATE PROVIDERS IN THE ANALYSIS AREA .....	U-4
U.2.1 Counties, Cities, and Communities .....	U-4
U.2.2 Service Providers .....	U-5
U.2.2.1 Sewers and Sewage Treatment .....	U-5
U.2.2.2 Water .....	U-5
U.2.2.3 Stormwater Drainage .....	U-5
U.2.2.4 Solid Waste Management .....	U-6
U.2.2.5 Housing .....	U-6
U.2.2.6 Transportation .....	U-6
U.2.2.7 Traffic Volumes and Roadways .....	U-7
U.2.2.8 Pavement Conditions .....	U-8
U.2.2.9 Police Protection .....	U-8
U.2.2.10 Fire Protection .....	U-9
U.2.2.11 Health Care .....	U-9
U.2.2.12 Schools .....	U-9
U.3 IMPACTS ON PROVIDERS .....	U-9
U.3.1 Economic and Demographic Impacts .....	U-9
U.3.1.1 Population .....	U-9
U.3.1.2 Economic Activity .....	U-9
U.3.1.3 Tax Revenues .....	U-10
U.3.2 Sewers and Sewage Treatment .....	U-10
U.3.3 Water .....	U-10
U.3.4 Stormwater Drainage .....	U-10
U.3.5 Solid Waste Management .....	U-10
U.3.6 Housing .....	U-11
U.3.7 Transportation .....	U-11
U.3.7.1 Construction Traffic Volumes .....	U-11
U.3.7.2 Construction Traffic and Design Standards .....	U-12
U.3.7.3 Operational Impacts .....	U-12
U.3.8 Police Protection .....	U-13

U.3.9	Fire Protection and Emergency Response .....	U-13
U.3.10	Health Care .....	U-14
U.3.11	Schools .....	U-14
U.4	EVIDENCE THAT ADVERSE IMPACTS IDENTIFIED IN SECTION (C) ARE NOT SIGNIFICANT .....	U-14
U.4.1	Economic and Demographic Impacts .....	U-14
U.4.2	Sewers and Sewage Treatment.....	U-15
U.4.3	Water.....	U-15
U.4.4	Stormwater Drainage .....	U-15
U.4.5	Solid Waste Management.....	U-15
U.4.6	Housing .....	U-16
U.4.7	Transportation .....	U-16
U.4.8	Police Protection .....	U-16
U.4.9	Fire Protection and Emergency Response .....	U-16
U.4.10	Health Care .....	U-17
U.4.11	Schools .....	U-17
U.5	PROPOSED MONITORING PROGRAMS .....	U-17
U.6	SUMMARY.....	U-17
U.7	REFERENCES.....	U-17

## ATTACHMENTS

U-1	Ability of Jefferson County Fire District #1 to Provide Fire Protection Services
U-2	Ability of Jefferson County Sheriff's Office to Provide Police Protection Services

## TABLES

U-1	Historical Population of Counties, Cities, and Communities within the Analysis Area .....	U-5
U-2	Housing Supply in Counties, Cities, and Communities within the Analysis Area .....	U-6
U-3	Oregon State Highway Traffic Volumes and Lane Numbers.....	U-8
U-4	Pavement Conditions on County Roadways Proposed as Transportation Routes .....	U-8
U-5	Anticipated Increase in Traffic Volume from Construction on Transportation Routes.....	U-12
U-6	Anticipated Increase in Traffic Volume from Operation on Transportation Routes .....	U-13

## FIGURES

U-1	Analysis Area for Public Services and Socioeconomic Impacts
U-2	Primary Transportation Routes

**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 OAR 345-022-0110. The applicant shall include:*

**Response:** In accordance with OAR 345-001-0010(57)(b), the analysis area for public services consists of the area within the Madras Solar Energy Facility (Facility) site boundary and 10 miles from the Facility site boundary. Figure U-1 shows the analysis area, which is located wholly within Jefferson County, Oregon. This Exhibit describes the potential adverse impacts of Facility construction and operation on employment, population, housing, transportation, sewers and sewage treatment, water, stormwater drainage, solid waste management, air traffic, police and fire protection, health care, and schools in the analysis area.

OAR 345-022-0110 requires that the site certificate application for the proposed energy facility address important public services:

*“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, stormwater drainage, solid waste management, housing, traffic safety, police and fire protection, health care and schools.”*

OAR 345-022-0110, however, is not a directly applicable approval criterion for solar energy facilities and other selected special criteria facilities [see OAR 345-022-0110(2) and (3), 345-015-0310]. While not directly applicable, the Energy Facility Siting Council (EFSC) may still apply the requirements of OAR 345-022-0110(1) as conditions on the Facility’s site certificate. Therefore, this Exhibit is organized in accordance with the application requirements contained in OAR 345-021-0010(1)(u) and provides evidence to support a finding by EFSC as required by OAR 345-022-0110.

## **U.1 ASSUMPTIONS USED TO EVALUATE POTENTIAL IMPACTS**

**OAR 345-021-0010(1)(u)(A)** *The important assumptions the applicant used to evaluate potential impacts.*

**Response:** The assumptions used to evaluate the potential Facility impacts on employment, population, housing, transportation, sewers and sewage treatment, water, stormwater drainage, solid waste management, air traffic, police and fire protection, health care, and schools in the analysis area are described in the following subsections.

### **U.1.1 Employment**

#### **U.1.1.1 Construction**

Madras PV1, LLC (Applicant) tentatively proposes to begin construction by June 1, 2021, and complete construction by March 1, 2022. During construction, the Facility will employ an average of approximately 100 people. An estimated maximum of 200 people may be employed during peak construction in the summer months.

The majority of the construction workforce will be employees of construction contractors and equipment manufacturing companies, who will be directly contracted by the Applicant or contractors. These workers will include those hired for road and solar array foundation construction, electrical substation construction, solar module installation, and array connection and commissioning. For this analysis, the Applicant conservatively estimates that approximately 10 to 15 percent of the construction workers will be hired locally (from Jefferson County) and the remainder will come from outside of the analysis area (greater than 10 miles from the Facility). However, the estimate of construction workers to be hired locally may be higher is sufficiently skilled labor is readily available.

The percentage of locally hired workers will vary, depending on the availability of specialized laborers with the necessary experience to construct the various Facility components. Additional workers might commute daily from communities outside of the 10-mile analysis area, such as Redmond or Bend, which could lessen the impacts of an influx of new residents on local service

providers. However, an increase in workers commuting from outside the analysis area could increase traffic on the roads within the analysis area. The Applicant will hire locally to the extent possible to minimize these impacts and support the local economy.

### **U.1.1.2 Operations**

The Facility is not anticipated to require full-time operations and maintenance (O&M) staff. The Facility will be monitored remotely, with two to four part-time technicians at a time deployed on an as-needed basis for maintenance and repairs. It is expected that O&M staff will be hired locally (i.e., within a 2-hour radius of the project site), with the exception of positions that may require previous experience at other solar generation facilities. Some specialized third-party contractors also may be required for equipment repairs. Facility operations are anticipated to begin in March of 2022.

## **U.1.2 Population and Housing**

### **U.1.2.1 Construction**

The 10-mile analysis area is fully within Jefferson County, Oregon. It is expected that the population will change very little as a result of Facility construction. Assuming conservatively that only 10 to 15 percent of the construction workers will be local residents (from Jefferson County), an average of about 85 and a maximum of about 180 new workers will be temporary residents (in-migrants) at the Facility. Based on the assumption that the average household size will be 2.0 persons (since it is likely many workers will not be accompanied by families or others), an estimated maximum of about 360 temporary new residents may be associated with Facility construction during the peak construction period. However, it is likely the actual number of temporary residents will be lower due to more local hiring and fewer workers bringing families or others with them. In-migrants associated with construction will likely choose temporary housing options such as hotels, campgrounds, recreational vehicle (RV) parks, rental houses, or other temporary housing located within a commutable distance, defined as approximately 70 miles, to the Facility. The commutable distance was selected based on an assumed travel distance of 1 hour.

### **U.1.2.2 Operations**

Compared to construction, even fewer new permanent residents are expected to result from Facility operations. It is assumed that no permanent, fulltime employees will be hired as part of the Facility operating staff. The Facility will be monitored remotely, with two to four part-time technicians at a time deployed on an as-needed basis for maintenance and repairs. Some of these technicians will likely already be local residents. Assuming conservatively that 50 percent (two) of these employees are in-migrants with an average household size of 3.0 (larger than for temporary employees as a result of the expectation that more employees will be living with families or others), as many as six new permanent residents could be added to the local population. It is assumed that these workers will live locally, with the exception of specialized personnel who may commute from outside the area. The actual number of permanent residents added by the Facility is insignificant in comparison to the population of Jefferson County.

## **U.1.3 Transportation**

A number of transportation routes will be used to access the Facility during construction and operations. These routes will be used to bring Facility components, equipment and materials, water, and workers from outside of the analysis area to the Facility and will include state, county, and private roadways. The primary transportation route is depicted on Figure U-2. The following sections describe the transportation routes, truck traffic, and points of origin.

### **U.1.3.1 Transportation Routes**

The primary transportation route to the site will likely begin in the Portland, Oregon, area and continue eastbound on US 26 toward Jefferson County. The transportation route is assumed to carry construction-related vehicles, including equipment component delivery vehicles, water trucks, and the majority of workforce traffic.

From US 26, the primary transportation route will enter the City of Madras and continue south to the intersection with US 97. The route continues due south on US 97 for approximately 0.95 mile to SW Belmont Lane where it turns west and continues for approximately 5.7 miles to SW Elk

Drive. From SW Belmont Lane, the route then turns north on SW Elk Drive and extends for approximately 2.5 miles to the Facility site.

The plan for access to the Facility from SW Elk Drive and the plan for internal circulation has been reviewed by Mr. Brian Huff, Fire Chief/Fire Marshal with Jefferson County Fire District #1 (see Attachment U-1). Mr. Huff did not have any concerns with access or circulation and did not request any plan revisions. Mr. Huff did not request a perimeter road around the Facility.

The Facility will have three main points of access from SW Elk Drive for construction and operation as shown on the conceptual site plan (see Figures C-2A and C-2B in Exhibit C), which is the plan Mr. Huff reviewed. Two points of access will be 20-foot-wide gravel access road segments into the southern end of the Facility. One of these access points extends into the portion of the Facility west of SW Elk Drive and the other extends into the southern end of the Facility east of SW Elk Drive. The graveled entrance/exit point west of SW Elk Drive ends within the Facility after approximately 120 feet and the graveled entrance/exit point east of SW Elk Drive ends within the Facility after approximately 140 feet. At the end of the access road segments, internal circulation will be via the 16- to 20-foot-wide clear spaces between the rows of solar modules (see Figures C-2A and C-2B in Exhibit C).

The main access road providing access to the construction staging and laydown area, O&M enclosure, Facility substation, point of interconnection, and northern end of the Facility will be a 24-foot-wide graveled road extending east from SW Elk Drive (see Figures C-2A and C-2B in Exhibit C) for approximately 960 feet before ending at the Facility's substation. Again, access to various areas around the Facility will be via the 16- to -20-foot-wide clear spaces between the rows of solar modules.

Based on conversations with Jefferson County about the pavement (see Section U.2.2.8 and Table U-4), it is assumed that the existing portions of SW Elk Drive on either side of the proposed access road segments are of sufficient quality to accommodate anticipated construction traffic.

#### **U.1.3.2 Truck Traffic**

During construction, a number of trucks will be accessing the site on the transportation route described above. Heavy-duty trucks will be carrying gravel and other materials required for site grading and to construct the new site access road segments. Heavy-duty trucks will also carry concrete materials for Facility component foundations and materials for the solar module blocks themselves, if foundations are necessary. Lighter-duty trucks will be utilized to deliver water to the site for dust control during construction and for the temporary concrete batch plant, if one is necessary. Light-duty trucks carrying electrical equipment and materials required for solar panel construction and power transmission also will be necessary.

#### **U.1.3.3 Points of Origin**

Facility construction is anticipated to take approximately 9 months. During construction, an estimated average workforce of 100 people will be employed, with a maximum of 200 people during the peak months of construction. Local workers could originate in Madras, but will most likely originate in other cities within 50 miles of the Facility site boundary such as Redmond (25 miles south), Prineville (28 miles southeast), and Bend (approximately 42 miles south). It is assumed that some workers from outside the local area may temporarily relocate to communities closer to the Facility. Workers needed for specialized construction (e.g., solar panel installation and power transmission) may originate from areas outside Jefferson County.

#### **U.1.4 Sewers and Sewage Treatment**

During construction, sewage treatment and handling will be provided by licensed haulers and disposal facilities. No publicly owned treatment works hookups are within the Facility footprint. As such, the sewage services required by the Facility during construction will be related to the handling of sewage from contract portable toilets.

During operations, restroom facilities associated with the O&M enclosure will be provided in the form of temporary portalets. Water used for sanitary purposes will be treated offsite.

### U.1.5 Water

As described in Exhibit O, it is estimated that approximately 12.8 million gallons of water (including approximately 2.2 million gallons if concrete ballasts are used for solar photovoltaic module posts) will be required for the Facility during construction under worst-case conditions. This includes water for civil and site preparation, concrete mixing, drinking, and sanitation over the planned construction timeframe.

Once the Facility is constructed, water needs will be limited. Water will be used to periodically wash the solar modules (panels) and for employee drinking and sanitation water. Washing of solar modules is conservatively assumed to occur twice a year, which will require approximately 1,650,000 gallons of water per year. A third-party contractor will obtain water for panel cleaning from an offsite source. Employee sanitation during operations will be provided in the form of a hand-washing station and portable toilets. Drinking water will be purchased in bottles.

### U.1.6 Stormwater Drainage

No public stormwater systems will be utilized by the Facility. During construction, erosion and sediment control measures developed pursuant to the Facility's 1200-C Construction Stormwater National Pollutant Discharge Elimination System (NPDES) Permit will be applied. Facility components will be designed to maintain existing stormwater drainage patterns.

### U.1.7 Solid Waste Management

Solid waste generated during construction will include general construction debris, waste concrete, and excavated soil. Excavated soil will be used onsite as fill or transported offsite for disposal. Construction material and office recycling programs will be implemented to the extent practical to reduce the volume of material that will be disposed of as solid waste. During operations, the primary waste generated will be solid waste from maintenance and housekeeping activities.

### U.1.8 Police and Fire Protection

The key assumptions for assessing police and fire protection adequacy in the analysis area are the estimates of additional construction and operational personnel and their families who may migrate to the area as a result of the Facility. These assumptions are included in Sections U.1.1 and U.1.2.

### U.1.9 Health Care

The key assumptions for assessing impacts to health care in the analysis area are the estimates of additional construction and operational personnel and their families who may migrate to the area as a result of the Facility. These assumptions are included in Sections U.1.1 and U.1.2.

### U.1.10 Schools

The key assumptions for assessing impacts to schools in the analysis area are the estimates of additional construction and operational personnel and their families who may migrate to the area as a result of the Facility. These assumptions are included in Sections U.1.1 and U.1.2. Furthermore, it is assumed that construction work for the Facility will be short-term and temporary with peak construction occurring during the summer months.

## U.2 PUBLIC AND PRIVATE PROVIDERS IN THE ANALYSIS AREA

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

**Response:** The public and private providers of services in the analysis area are identified in the following subsections.

### U.2.1 Counties, Cities, and Communities

The Facility is located in Jefferson County. The analysis area, a 10-mile radius of the Facility site boundary, is entirely within Jefferson County (Figure U-1). The cities of Madras, Culver, and Metolius, Oregon, are within the analysis area. Table U-1 presents historical population estimates for Jefferson County, the cities and places within the analysis area, and other cities nearest but

outside the Facility analysis area. In 2015, approximately 0.6 percent of the entire State of Oregon population resided in the Jefferson County.

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

	Population				Average Annual Growth Rate	
	1990	2000	2010	2015	1990-00	2000-10
Jefferson	13,816	18,995	21,720	22,555	3.2%	1.3%
Madras	3,068	5,306	6,046	6,504	5.3%	1.3%
Culver	550	802	1,357	1,421	3.7%	5.1%
Metolius	903	741	710	735	-2.0%	-0.4%
Redmond	7,359	15,288	26,215	28,389	7.0%	5.3%
Bend	24,024	52,017	76,639	86,238	7.4%	3.8%
Prineville	5,617	8,374	9253	9,415	3.9%	1.0%

Source: U.S. Census Bureau, 2019a.

Between 1990 and 2010, communities in the analysis area generally added population at varying rates. Only the City of Metolius experienced a decrease in population. The annual growth rate for all but the City of Culver decreased from 2000 to 2010. Though growth slowed between 2000 to 2010 as compared to the period from 1990 to 2000, Jefferson County gained over 7,900 residents between 1990 and 2010.

Cities outside the analysis area, including Redmond, Bend, and Prineville, all experienced a similar trend in growth, with a higher average annual growth rate occurring during the period between 1990 and 2000 as compared to 2000 to 2010.

## **U.2.2 Service Providers**

Public service providers for the communities in the analysis area that provide the essential governmental services listed in OAR 345-022-0110(1) are described in the subsections below.

### **U.2.2.1 Sewers and Sewage Treatment**

The Facility site is not in the service area of any current providers of sewers or sewage treatment. The cities of Madras, Culver, Warm Springs, and Metolius have sewer systems and treatment facilities, but no other rural areas in the analysis area have such facilities. Rural residences in the area generally use onsite private septic systems for sewage disposal. Restroom facilities associated with the O&M enclosure will be provided in the form of temporary portalets. Sanitary water will be sent offsite for treatment.

### **U.2.2.2 Water**

The Deschutes Valley Water District is the primary water service provider that serves customers in the Cities of Culver, Metolius, and Madras (Deschutes Valley Water District, 2017). The City of Warm Springs has a public water system that serves their incorporated area, but this system will not be used or affected by the Facility. During construction, water will most likely be purchased from the Deschutes Valley Water District, which has sufficient domestic water capacity to supply to the Facility and has agreed to manage the water sales through its hydrant meter program (Exhibit O). Water associated with the Facility operation will be trucked in from offsite sources (see Exhibit O).

### **U.2.2.3 Stormwater Drainage**

No service providers in the analysis area currently provide stormwater drainage service to the Facility site. During construction, numerous best management practices (BMPs), outlined in the Facility erosion and sediment control plan (ESCP) (Attachment I-1 to Exhibit 1), will be implemented to minimize erosion and sedimentation that could alter the surrounding stormwater drainages. Stormwater will infiltrate into the ground.

#### U.2.2.4 Solid Waste Management

Madras Sanitary Service provides residential and commercial solid waste management services within the City of Madras and Jefferson County. Solid waste disposal for the Facility during construction and operations will be provided by private contract with a local commercial hauler or haulers. The closest public transfer station is the Jefferson County Box Canyon Transfer Station operated by Madras Sanitary Service, located approximately 11 miles by car from the Facility. The closest public landfill is the Crook County Landfill operated by Crook County, located in Prineville approximately 40 miles by car from the Facility.

#### U.2.2.5 Housing

Assuming conservatively that only 10 to 15 percent of the construction workers will be local residents (from Jefferson County), an average of about 85 and a maximum of about 180 new workers will be temporary residents (in-migrants) as a result of construction of the Facility. Therefore, a comparable number of temporary housing units will be needed for the estimated temporary workforce. Motels, hotels, and trailer or RV parking will be the most available housing option for temporary residents. An Internet search identified more than 500 hotel and motel rooms in communities within a commutable distance, or approximately 70 miles, to the Facility (Hotelguides.com, 2019; Bend Bulletin, 2018). Some rooms are available in Madras. Most rooms were found in Redmond or Bend, which are both located outside the analysis area, but within commuting distance. Additional temporary housing will be available in overnight facilities located at Oregon state parks and private RV campgrounds. Lake Simtustus Resort & Marina and Central Oregon RV Park in Madras and Mt. View RV Park in Metolius, for example, have over 200 sites combined that can accommodate RVs (Lake Simtustus Resort, 2019; Jefferson County, 2018; Mt. View RV Park, 2019). Hotel occupancy was measured from January to May 2019 to be approximately 58 percent for Central Oregon (Oregon Tourism Commission, 2019).

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, for the one to two new permanent households anticipated because of Facility operations. An adequate supply of housing is available within a commutable distance from the Facility, including the housing stock in the analysis area, with what is available in nearby communities, and larger cities such as Redmond and Bend.

Table U-2 presents housing supply and availability data for counties and communities within or near the analysis area.

**Table U-2. Housing Supply in Counties, Cities, and Communities within the Analysis Area**

	Housing Units		Average Annual Growth Rate	Vacancy Rate
	2010	2017	2010-2017	2017
Jefferson	9,743	9,951	0.3%	23.3%
Madras	2,843	2,647	-1.0%	15.2%
Culver	436	529	2.8%	6.6%
Metolius	274	340	3.1%	6.8%
Redmond	10,441	11,403	1.3%	4.7%
Bend	35,610	38,970	1.3%	9.4%
Prineville	4,172	4,417	0.8%	5.7%

Source: U.S. Census Bureau, 2019b.

Housing vacancy rates for 2017 estimates, based on the 2019 census, ranged from 4.7 percent in Redmond to 15.2 percent in Madras. The county average vacancy rate of approximately 23.3 percent is higher than the state of Oregon's average of 9.3 percent.

#### U.2.2.6 Transportation

The providers of transportation services in the study area are the City of Madras Public Works Department, Jefferson County Public Works Department and the Oregon Department of Transportation (ODOT) Region 4. The Madras Municipal Airport is a public use airport owned by



the City of Madras located approximately 2 miles east of the Facility and just northwest of the city limits.

Roadways surrounding the Facility, specifically those along the transportation routes, may be temporarily affected by traffic increases as a result of construction vehicles accessing the site. The primary transportation route to the Facility utilizes US 26, a state roadway. Since the state highway system is constructed to design, safety, and load-bearing standards, minimal impacts are anticipated from potential construction and operational traffic on traffic safety or road maintenance. US 26 is capable of accommodating vehicles at the legal load limit, thereby reducing the potential for significant traffic safety and maintenance impacts. Impacts due to vehicle volume increases will be inconsequential, as construction vehicles will constitute just a fraction of the daily traffic typical on US 26 near the City of Madras.

Within the City limits, the transportation route is on US 97, a state roadway. This section of the primary transportation route serves southbound traffic only (part of the SW 5th Street couplet) and provides local access to many businesses and retail establishments. The potential increase in traffic volumes is expected to be inconsequential, as construction vehicles will constitute just a fraction of the daily traffic.

There are currently no permanent restrictions for trucks on US 97 through the City of Madras. One permanent weight restriction is in effect on US 26 north of Madras on the North Unit Canal Bridge at milepost 115. This bridge is restricted to 30 tons on a 5-axle, single-unit truck, 33 tons on a 6-axle, single-unit truck, and 36 tons on a 7-axle, single-unit truck. Vehicles exceeding the weight and axle limits will detour onto county roadways to avoid the bridge. The current signed detour from US 26 directs vehicles eastbound on NW Elm Lane, southbound on N Adams Drive, and westbound on NW Cherry Lane back to US 26.

West of Madras, the transportation route is on SW Belmont Lane, which is classified as a minor collector by Jefferson County. SW Elk Drive is classified as a local road. On SW Belmont Lane, a bridge located approximately 2 miles west of US 97 has a load limit of 80,000 pounds. Vehicles greater than 80,000 pounds may use an alternate route around the bridge from US 97. Instead of turning westbound onto SW Belmont Lane, overweight trucks would continue south on US 97, turn west on SW Dover Lane, north on Santium Drive and SW Snyder Drive to SW Columbia Drive. From SW Columbia Drive, vehicles would turn west and continue on SW Belmont Lane on the original transporter route. There are no load restrictions on SW Elk Drive between SW Belmont Lane and the site entrance (Jefferson County, 2007).

#### **U.2.2.7 Traffic Volumes and Roadways**

Average daily traffic volumes (ADT) on the primary transportation route (US 26 and US 97) were collected from the most recent 5 years of published ODOT traffic data (ODOT, 2013, 2014, 2015, 2016, and 2017).

US 26 begins on the west coast of the state at US 101 and extends east to the Oregon-Idaho state border. It runs through the Portland metropolitan area, the Mt. Hood National Forest, and the Warm Springs Reservation. Between Mt. Hood and Madras, the transportation route on US 26 is named by ODOT as Warm Springs Highway No. 53, and is functionally classified as a principal arterial on the National Highway System.

Outside of Madras city limits, US 26 is generally an undivided, two-lane highway (one lane in each direction) with varying paved shoulder widths. In certain sections, two lanes are provided in one direction of travel for climbing/passing vehicles. It has a posted speed limit of 50 to 55 miles per hour (mph). Within the City of Madras, US 26 transitions to a four-lane divided arterial with turn lanes at intersections and mid-block access points to driveways. The posted speed limit is 45 mph within the city.

Just north of the city limits, traffic volumes on US 26 have roughly doubled in the past 5 years. Within the city, traffic volumes decreased significantly between 2013 and 2014, but have since gradually increased resulting in an overall growth rate of approximately 2 percent overall between 2013 and 2017.

US 97 runs north-south through Oregon from the Washington border (Columbia River at Biggs Junction) to the California border (south of Klamath Falls). On the transportation route within

Madras, US 97 is functionally classified by ODOT as a principal arterial on the National Highway System and is named The Dalles-California Highway No. 4.

The portion of US 97 on the Facility transportation route is a one-way southbound, two-lane travel way with parallel parking and multiple driveways on both sides of the street. A bicycle lane is also provided on the right side of the road. The posted speed limit is 25 mph within the city.

Traffic volumes on US 97 have decreased slightly in the past 5 years. At the northern end of the transportation route, average daily traffic volumes have decreased by nearly 10 percent overall between 2013 and 2017. At the southern end of the route, traffic volumes have decreased by approximately 2 percent since 2013.

Table U-3 presents the ADT volumes for the most recent 5 years of data available at various milepost locations along the transportation routes.

**Table U-3. Oregon State Highway Traffic Volumes and Lane Numbers**

Highway	Location	Milepost	Number of Lanes	2013 ADT	2014 ADT	2015 ADT	2016 ADT	2017 ADT
US 26	North of Madras	113.93	2, undivided	7,500	7,600	14,000	14,900	15,000
US 26	Madras	117.69	4, divided	12,400	10,800	11,300	11,900	12,600
US 97	Madras	92.44	2, divided	12,400	10,200	10,800	1,500	11,200
US 97	Madras	93.06	2, divided	10,300	8,700	9,300	9,800	10,100

Sources: ODOT, 2013, 2014, 2015, 2016, and 2017.

### U.2.2.8 Pavement Conditions

Table U-4 summarizes the pavement condition of state and county roadways proposed for use as transportation routes. Most segments of state highway proposed as transportation routes are in varying states. Pavement conditions are reported by ODOT Pavement Services, and are published in various district and regional pavement condition maps. The most recent pavement map covering the Facility vicinity was published in 2018.

Pavement conditions on county roadways proposed as transportation routes were provided by Jefferson County (Jefferson County, 2019).

**Table U-4. Pavement Conditions on County Roadways Proposed as Transportation Routes**

Highway/Roadway	Pavement Condition
US 26 (North of Madras)	Very Good
US 26 (Within Madras)	Poor
US 97 (Within Madras)	Poor
SW Belmont Lane (Between SR 361 and SW Elk Drive)	Good
SW Elk Drive (Between SW Belmont Drive and Pelton Dam Road)	Very Good

Sources: ODOT, 2019. Jefferson County, 2019.

### U.2.2.9 Police Protection

Local police service in the Facility analysis area is provided by the Jefferson County Sheriff's Office in Madras, Oregon. Jefferson County Sheriff's Office has agreed to provide police protection for the Facility (see Attachment U-2). Backup law enforcement service is available from the Oregon State Police Eastern Region, with an office in Madras. The cities of Madras, Metolius, Culver, and Warm Springs also have local police departments that could likely assist in the event of an emergency at the Facility.

### U.2.2.10 Fire Protection

The Facility is located just outside the boundary for Jefferson County Fire District #1. However, Jefferson County Fire District #1 has agreed to provide protection for the Facility once the site is annexed into the fire district (see Attachment U-1). The Applicant will ensure that the Facility site is annexed into the service boundary for Jefferson County Fire District #1, prior to initiating construction of the Facility.

### U.2.2.11 Health Care

The nearest hospital to the Facility is St. Charles Madras (about 9 miles away by car). The St. Charles Health System also has locations in Redmond, Prineville, and Bend (St. Charles Health System, 2019). This provider offers basic, intermediate, and advanced life support emergency medical care and transportation.

Although the Facility will employ an average of approximately 100 people during construction, no significant impacts on health care services are anticipated from this temporary population increase.

### U.2.2.12 Schools

Communities in and near the analysis area are served by the Jefferson County School District and Culver School District. Schools in Madras, part of the Jefferson County School District, include Madras Elementary School, Buff Elementary School, Jefferson County Middle School, Bridges High School, and Madras High School (Jefferson County School District 509-J, 2019). The Culver School District consists of an elementary school, middle school, and high school (Culver School District #4, 2019).

## U.3 IMPACTS ON 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.*

**Response:** The following subsections describe any likely adverse impacts on the ability of the providers identified.

### U.3.1 Economic and Demographic Impacts

#### U.3.1.1 Population

The Facility will result in limited in-migration for construction-related employment and permanent O&M employment. The influx of temporary construction-related jobs filled from outside of the analysis area is anticipated to last no more than 12 months. During that time, a positive impact on the local economy is expected as workers likely will stay at area motels, eat at local restaurants, and purchase amenities such as gas and groceries in the local area.

Of the estimated staff of two to four part-time technicians who will be deployed to the Facility on an as-needed basis for O&M, qualified local applicants, qualified applicants from outside the area, or both will be hired. It is assumed that these workers will live locally. In-migrant operational staff and their families will not have a significant impact on the local population. Assuming conservatively that 50 percent (two) of the O&M positions are filled from outside the analysis area and the average household size is 3.0 (higher than for temporary employees), approximately six new residents could be added to the local population, if all relocate within Jefferson County. That number is small in comparison to the populations of Jefferson and surrounding counties.

#### U.3.1.2 Economic Activity

Revenue generated for the local economy will benefit public services, including schools and others services Jefferson County provides for their citizens. Income earned by in-migrant workers will contribute to the local economy indirectly through local purchases. In addition, the Facility itself will purchase goods and services from local and regional businesses, including Facility maintenance services, office equipment, and contract services. 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 new employment opportunities.

### **U.3.1.3 Tax Revenues**

Development of the Facility will result in an increase in annual property tax revenue to Jefferson 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 residents.

### **U.3.2 Sewers and Sewage Treatment**

No adverse impacts are anticipated from Facility construction as sewage service demands will be minimal and temporary. The only sewage services required by the Facility during construction will be related to the handling of sewage from contract portable toilets.

Restroom facilities associated with the O&M enclosure will be provided in the form of temporary portalets. All sanitary water will be sent offsite for treatment.

### **U.3.3 Water**

It is estimated that approximately 12.8 million gallons (including approximately 2.2 million gallons if concrete ballasts are required for solar photovoltaic module posts) of water will be required for the Facility during construction and 1.65 million gallons per year may be required for module washing during operations. Water for construction and module washing will be purchased from the Deschutes Valley Water District under an existing municipal water right. As demonstrated in Exhibit O, the Deschutes Valley Water District has sufficient domestic water capacity to supply the Facility without impairing supply to existing users.

Employee sanitation during operations will be provided in the form of a hand-washing station and portable toilets. Drinking water will be purchased in bottles. 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. Accordingly, no adverse impacts on water use are anticipated.

### **U.3.4 Stormwater Drainage**

During construction, application of the erosion and sediment control measures developed pursuant to the Facility's 1200-C Construction Stormwater NPDES Permit, as described in Section U.4.4, will prevent adverse impacts related to construction of these facilities. Facility components will be designed to maintain existing stormwater drainage patterns. Exhibit E describes the 1200-C permit in greater detail. A copy of the permit application is located in Attachment I-1 to Exhibit I.

Through proper site design and the other procedures described in Section U.4.4, no adverse impacts on stormwater drainage are anticipated during operations.

### **U.3.5 Solid Waste Management**

Solid waste generated during construction will include general construction debris, waste concrete, and excavated soil. Excavated soil will be used onsite as fill or transported offsite for disposal. Construction material and office recycling programs will be implemented to the extent practical to reduce the volume of material that will be disposed of as solid waste. General construction debris will be collected by a local contractor and transported to a municipal waste transfer station in Jefferson County or municipal waste landfill in Crook County. As described in Exhibit V, minimal construction waste will require offsite disposal. In addition, only minimal amounts of solid waste will be generated by the Facility during operations. The selected landfill for waste disposal has sufficient capacity to handle the needs of the Facility. Crook County landfill is situated on a 1,640-acre site of which 75 acres have been used for disposal and has an estimated life of 50 additional years (Oregon Department of Environmental Quality, 2019).

Because solid waste disposal for the Facility during construction and operations will be provided through a private contract with a local commercial hauler or haulers (Exhibit V), service to the Facility is not anticipated to disrupt services already being provided in the surrounding communities.

### U.3.6 Housing

While it is not known where the new temporary residents associated with the construction of the Facility will settle and what type of housing they will select, motels, hotels, and trailer or RV parking will be the most available housing option for temporary residents. More than 500 hotel and motel rooms in communities within a commutable distance, and additional temporary housing in overnight facilities located at Oregon state parks and private RV campgrounds, were identified within a commutable distance to the Facility. Lodging vacancy rates in Central Oregon were estimated at approximately 58 percent (Oregon Tourism Commission, 2019). Considering similar occupancy rates during the construction phase of the Facility, adequate supplies are available in relation to the number of temporary workers.

Permanent housing for up to two new households may be required when operations begin. Given the limited number of new housing required and the general availability of housing opportunities, ranging from 4.7 percent in Redmond to 15.2 percent in Madras, no significant adverse impacts on the ability of communities to provide housing are anticipated from Facility operations.

### U.3.7 Transportation

It is anticipated that roadways within the analysis area will safely accommodate Facility construction traffic. Public airports within the analysis area are equipped to handle additional air traffic should it be needed to support construction or operation of the Facility. The Madras Municipal Airport is located 3 miles northwest of Madras and includes aircraft parking and hanger leasing and sales (AirNav, 2019).

#### U.3.7.1 Construction Traffic Volumes

Facility construction will temporarily increase the traffic volume on roads within the analysis area, specifically the transportation route. Construction is not expected to cause an increase in the potential of traffic safety impacts on surrounding roadways, because construction traffic will be managed to minimize impacts.

Vehicle size and weight may be of concern where roadway conditions are poor, where permanent restrictions exist, or where roads are designed for less than the legal load limit of 80,000 pounds. The North Unit Canal Bridge at milepost 115 on US 26 has permanent weight restrictions. The bridge on SW Belmont Lane between SW Columbia Drive and SW Bear Drive is also weight restricted. Both locations have alternative routes that trucks can take to avoid the bridges. To mitigate concerns about oversized loads, any oversized components will be transported by oversized transportation trucks, legal loads, and trucks. Additional oversized vehicles will transport large construction operating equipment (e.g., cranes, bulldozers).

To estimate the impacts on traffic volumes on the primary transportation route, the Applicant assumed 4 to 6 months of peak construction activity, with 22 days of construction per month. During peak construction, an estimated 45 daily trucks will be put in use each day, for an estimated total of 90 truck trips per day (45 trucks making one inbound trip and one outbound trip). Truck trips will include construction equipment and material deliveries. Approximately 200 workforce personnel will be required during the peak of construction. Assuming the majority of these workers carpool in two- and three-person carpools, roughly 100 workforce vehicles will arrive and depart the site each day. Combining truck trips and workforce trips, up to 145 construction vehicles (or 290 one-way trips) per day will be added to the background traffic patterns along the primary transportation route. This estimate is conservative, as truck trips and workers may not all be on the road at one given time, and the construction workforce will be distributed throughout a commutable distance from the Facility.

Based on data presented in Table U-3, average daily traffic volumes on US 26 in 2017 were 15,000 vehicles per day just outside the City of Madras, and 12,600 vehicles per day within City limits. Assuming construction vehicles originate northwest of the Facility, average daily traffic on US 26 could increase by 290 one-way trips per day (or approximately 1.9 to 2.3 percent) with construction trips. On US 97 within the City of Madras, average daily traffic volumes would increase by approximately 1.3 to 1.4 percent with construction trips.

Daily traffic volumes on SW Belmont Lane and SW Elk Drive are assumed to be significantly lower than volumes on US 26 or US 97, and would therefore see a higher relative increase in daily traffic volumes. However, both of these county roadways appear to be level with few driveways, access

points, or horizontal curves that could affect sight distance so it is unlikely that the safety of the roadways will be impacted. Backups and delays of a temporary nature may occur during the delivery of large components as a result of truck size, weight, and maneuverability. Large delivery trucks will be concentrated over a smaller duration within the overall construction schedule (e.g., approximately 4 to 6 months during peak construction), limiting the time period over which delays would occur. In addition, the arrival of large delivery trucks will likely be spread out over the course of the day, thereby minimizing delays resulting from each truck's transit over surrounding roads.

Table U-5 shows the anticipated increase in traffic volume during construction. Jefferson County does not publish traffic volume data for public or private roads. However, based on the rural nature of the area, existing volumes are assumed to be low (less than 1,000 vehicles per day).

Construction traffic volumes generated by the Facility represent a minimal increase in traffic over State Highway average daily volumes. The increase on SW Belmont Lane and SW Elk Drive could be significant but temporary in duration, and will be mitigated by the measures described here.

**Table U-5. Anticipated Increase in Traffic Volume from Construction on Transportation Routes**

Highway	Location	Milepost	Number of Lanes	2017 Average Daily Traffic	Estimated Average Daily Traffic Including Construction <sup>b</sup>	Percentage Increase
<b>Primary Transportation Route<sup>a</sup></b>						
US 26	North of Madras	113.93	2, undivided	15,000	15,290	1.9%
US 26	Madras	117.69	4, divided	12,600	12,890	2.3%
US 97	Madras	92.44	2, divided	11,200	11,345	1.3%
US 97	Madras	93.06	2, divided	10,100	10,245	1.4%

<sup>a</sup> Oregon Department of Transportation, 2014-2018 Traffic Volume Tables.

<sup>b</sup> Average daily traffic assuming all construction vehicles originate northwest of the Facility (Portland metropolitan area).

Air traffic is not expected to be impacted by construction or operation of the Facility. The majority of construction and operations personnel will use vehicular transportation to access the Facility and will not utilize air traffic. Components will be delivered by truck and not by air.

### U.3.7.2 Construction Traffic and Design Standards

US 26 and US 97 comprise the portions of the primary transportation route under state jurisdiction. Both highways are designed and constructed to accommodate legal loads of 80,000 pounds without requiring a permit. Some trucks carrying large loads may exceed the legal load limit of 80,000 pounds gross vehicle weight. In cases where transportation vehicles exceed the legal load limit, the transportation contractor will seek authorization from ODOT. ODOT currently lists one bridge restriction along the primary transportation route at the North Unit Canal Bridge, at milepost 115 on US 26. A signed detour route onto county roadways is in place. Nevertheless, the Applicant's third-party contractor will consult with ODOT before construction to identify roadway segments or bridges that should be restricted for construction traffic, if any, and to obtain any heavy haul permits required to allow transport of oversized loads.

There are no transport restrictions published by Jefferson County on SW Elk Drive. SW Belmont Lane has a weight-restricted bridge between SW Columbia Drive and SW Bear Drive. This bridge is restricted to 80,000 pounds. An alternate route that avoids this bridge uses SW Dover Lane, Santium Drive, SW Snyder Drive, and SW Columbia Drive. the Applicant will consult with Jefferson County before construction to identify roadway segments or bridges that should be restricted for construction traffic.

### U.3.7.3 Operational Impacts

Traffic impacts during Facility operation are not anticipated. Operational trips would occur on an as-needed basis, and would include O&M staff traveling to work in their personal vehicles, and

specialized personnel who may travel in light-duty trucks. Delivery trucks may also access the site on occasion, but are not anticipated to occur daily. Once completed, the Facility will require far fewer trips and personnel than during construction. Assuming a maximum of four workers during operations, each with two round-trips into and out of the Facility per day, a worst-case increase in daily traffic from the Facility would include an additional 16 trips (8 inbound and 8 outbound) to traffic volumes. Table U-6 presents the anticipated worst-case increase in traffic trips as a result of Facility operation, assuming O&M staff traffic originates from the northwest of the Facility along US 26. Workforce personnel will likely originate from a combination of areas, and therefore traffic increases on US 26 or US 97 will be even lower than those stated in Table U-6. The additional volume of traffic on the transportation routes due to Facility operations will be negligible due to sufficient capacity on US 26 and US 97, and normal fluctuations in daily traffic. Therefore, adverse impacts on the transportation network are not anticipated during Facility operation.

**Table U-6. Anticipated Increase in Traffic Volume from Operation on Transportation Routes**

Primary Transportation Route <sup>a</sup>	Location	Milepost	Number of Lanes	2017 Average Daily Traffic	Estimated Average Daily Traffic Including Construction <sup>b</sup>	Percentage Increase
US 26	North of Madras	113.93	2, undivided	1,5000	15,016	0.11%
US 26	Madras	117.69	4, divided	12,600	12,616	0.13%
US 97	Madras	92.44	2, divided	11,200	11,216	0.14%
US 97	Madras	93.06	2, divided	10,100	10,116	0.16%

<sup>a</sup> Oregon Department of Transportation, 2014-2018 Traffic Volume Tables.

<sup>b</sup> Average daily traffic assuming all construction vehicles originate northwest of the Facility (Portland metropolitan area).

No air traffic is expected during the normal operation of the Facility. Operational workers will most likely access the Facility by vehicle. Should specialized workforce members need to fly to the site, these personnel would be minimal and would not affect operations at Madras Municipal Airport. These specialized workers would use public flights (not private jets) based on availability (i.e., tickets).

### U.3.8 Police Protection

The additional temporary and permanent workforce is not anticipated to create any significant concerns. Correspondence from the Jefferson County Sheriff's Office confirms that they will provide services for the Facility (see Attachment U-2). If needed, backup law enforcement will be available from the Oregon State Police. The relatively small number of new temporary and permanent residents is not anticipated to place significant new demands on the providers of police protection in the analysis area. Therefore, the Facility will not have a significant adverse impact on the ability of local communities to provide police protection or law enforcement services.

### U.3.9 Fire Protection and Emergency Response

During Facility construction, there could be some risk of accidental grass fires on the site. Therefore, measures taken to prevent fires during construction will include construction vehicles using established roads to keep vehicles away from dry grassland areas, using diesel vehicles whenever possible (to prevent potential ignition by catalytic converters), avoiding idling vehicles in grassy areas, and keeping cutting torches and similar equipment away from grass. Potential fire hazards from operation of the Facility include the possibility of electrical fire, in which case the fire will be monitored to ensure it does spread, but it will not be extinguished. The primary service fire protection and emergency response personnel will likely provide is providing first responders to injured or sick workers and transport to local hospitals.

Correspondence from the Jefferson County Fire District #1 confirms that they will provide services for the Facility once it is annexed into their service district boundary (see Attachment U-1). The

Applicant will ensure that the Facility site is annexed into the service boundary for Jefferson County Fire District #1, prior to initiating construction of the Facility. Following annexation and prior to initiating construction, the Applicant will notify the Fire 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 or around the Facility site boundary. The site will be equipped with fire protection equipment in accordance with the Oregon Fire Code. The plan for access to the Facility from SW Elk Drive and the plan for internal circulation has been reviewed by Mr. Brian Huff, Fire Chief/Fire Marshal with the Jefferson County Fire District #1 (see Attachment U-1). Mr. Huff did not have any concerns with access or circulation and did not request any plan revisions. Therefore, the Facility will not have a significant impact on the ability of local fire departments to provide fire protection services.

The relatively small number of new temporary and permanent residents is 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 during construction or operations.

### **U.3.10 Health Care**

The small number of new temporary and permanent residents is not expected to place significant new demands on routine health care services. Furthermore, impacts on local health care services will be minimized by careful management of site health and safety risks. To reduce the potential for health and safety risks, the Applicant will require that onsite construction contractors prepare site health and safety plans before they begin construction activities. Each plan will inform employees and others what to do in case of emergencies. Plans will include locations of fire extinguishers, important telephone numbers, and first aid techniques. Nearby hospital names, addresses, and contact information will be listed. The plans will be maintained during construction and operations.

Additional preventive measures could be included, such as briefings with local hospitals and emergency service providers, identification of an emergency helicopter or aircraft landing area, and coordination with local fire officials. Furthermore, the small number of new temporary and permanent residents is not expected to place significant new demands on the health care facilities that serve the area.

### **U.3.11 Schools**

Construction work for the Facility will be short-term and temporary. Therefore, a negligible number of new students are anticipated in association with Facility construction. During operations, up to two new permanent households may result from the Facility, an estimated maximum of four new schoolchildren (assuming two children per household) could move to the analysis area. Actual impacts on schools will depend on the housing choices of new residents with children, which is unknown. Given that new residents may settle in a dispersed area, 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.

## **U.4 EVIDENCE THAT ADVERSE IMPACTS IDENTIFIED IN SECTION (C) ARE NOT SIGNIFICANT**

**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.*

### **Response:**

### **U.4.1 Economic and Demographic Impacts**

Jobs created by the Facility, both new temporary construction jobs and new operations jobs created, will represent less than three percent of total employment in Jefferson County included in the analysis area (a total of 6,535 jobs [U.S. Bureau of Labor Statistics, 2018]). Similarly, new temporary and permanent populations will represent a small fraction of total population of Jefferson County. Because the Facility will be located in an unincorporated part of the county, the Facility and related jobs 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 employment in the analysis area.

#### **U.4.2 Sewers and Sewage Treatment**

As discussed in Section U.3.2, the Facility will have no significant adverse impact on the ability of any community in the area to provide sewers or sewage treatment and no mitigation measures are proposed.

#### **U.4.3 Water**

As discussed in Section U.3.3, the Deschutes Valley Water District will supply adequate water for the Facility without impairing supply to existing users. Therefore, no significant adverse impacts were identified and no mitigation measures are proposed.

#### **U.4.4 Stormwater Drainage**

New roads constructed as part of the Facility will be designed to maintain existing drainage patterns. Construction of roads, Facility foundations, and other related or supporting facilities will be regulated by an ESCP and 1200-C Construction Stormwater NPDES Permit that will require BMPs to minimize erosion and control sedimentation (see Exhibit I).

Erosion and sediment control BMPs will be implemented during all aspects of construction. BMPs will be selected to minimize and eliminate erosion, rather than controlling sedimentation after erosion has already occurred. Exhibit I contains the ESCP that will be implemented during construction of the Facility. Key BMPs presented in the ESCP are as follows:

- Preserve natural vegetation to the extent feasible.
- Establish vegetative buffer strips between the areas affected by construction activities and any receiving waters. Use vegetative buffers in conjunction with silt fence installation.
- Install sediment fence or straw wattles downgradient from land-disturbing activities.
- Stabilize disturbed areas mulching.
- Install check dams and sediment traps in drainages and roadside conveyances to capture sediment and minimize stormwater velocity.
- Use surface roughening techniques in conjunction with mulching disturbed areas.
- Reseed disturbed areas as final stabilization.
- Implement good housekeeping practices, such as using dedicated construction/equipment staging areas, and proper stockpile management, such as covering stockpiles with much or plastic sheeting.
- Perform concrete washout in dedicated areas.

Proper implementation and updating of the ESCP with updated BMPs, as needed, will minimize erosion and the potential for sediment transport. The Facility will not alter existing drainage patterns, in the surrounding areas directly adjacent to where the Facility is located.

During operations, the majority of the BMPs outlined above are not applicable because an industrial stormwater permit is not required for operations at this Facility and because construction activities requiring erosion and sediment control will be complete. However, adherence to site design and implementation of several good housekeeping BMPs during site operation will minimize erosion and mobilization of sediment. These practices include restoring the site in accordance with the Revegetation Plan (see Attachment P-6 to Exhibit P) required as part of the site certificate. No adverse impacts on the ability of any community to provide stormwater drainage are anticipated from Facility operations.

#### **U.4.5 Solid Waste Management**

As discussed in Section U.3.5, the Facility will generate minimal waste and use private contractors to haul waste. Services already being provided in the surrounding communities will not be disrupted by the Facility. Therefore, no significant adverse impacts were identified and no mitigation measures are proposed.

#### U.4.6 Housing

As discussed in Section U.3.6, no significant adverse impacts on the ability of communities to provide housing are anticipated. Therefore, no significant adverse impacts were identified and no mitigation measures are proposed.

#### U.4.7 Transportation

Traffic volumes will increase on roadways surrounding the Facility during construction. However, taking into account the mitigation measures described here, significant adverse impacts on traffic safety and transportation are not anticipated. Numerous practices will be implemented to ensure that roadway safety will not be negatively affected. As a result of relatively low traffic volumes on roads near the Facility in Jefferson County, and temporary increases in traffic volumes of approximately 2 percent or less, travel times and levels of service are not anticipated to worsen with Facility construction or because of operations staff. Although there may be short delays experienced during construction (as a result of slow-moving delivery trucks or trucks entering and exiting the Facility), the delays are likely to be temporary and limited to SW Elk Drive and will be mitigated with the following practices:

- Install and maintain temporary road signage and warnings such as “Equipment on Road,” “Truck Access,” or “Road Crossings” at locations where trucks are expected to slow down or enter/exit a public roadway, in accordance with Chapter 3, Section 3.3 of the ODOT *Traffic Control Plans Design Manual* (ODOT, 2019).
- Implement advance signage, where possible, in accordance with Chapter 3, Section 3.3 of the ODOT *Traffic Control Plans Design Manual* (ODOT, 2016c).
- Use pilot cars for slow or oversize loads per Oregon Administrative Rule 734-082-0035.
- Encourage and promote carpooling of the construction workforce, and potentially provide high-occupancy vans or buses to transport workers to the site.
- Use flag personnel to minimize the potential for accidents during large deliveries, in accordance with Chapter 3, Section 3.3.12 through 3.3.14 of the ODOT *Traffic Control Plans Design Manual* (ODOT, 2019).
- Restrict or limit large trucks through the US 97/SW 5<sup>th</sup> Street corridor during the morning or evening peak of commuter traffic.
- At all times during construction, maintain at least one travel lane at entrance and exit points onto public roads.

Traffic impacts during Facility operation are not anticipated. Operational trips including employees traveling to work in their personal vehicles, and specialized personnel who may travel in light-duty trucks, will be largely limited to SW Belmont Lane and SW Elk Drive. Delivery trucks may also access the site on occasion, but are not anticipated to occur daily. In addition, no increase in air traffic is anticipated as a result of Facility construction or operation. Therefore, the Applicant anticipates no significant adverse impacts on the transportation network during Facility operation.

#### U.4.8 Police Protection

As described in Section U.3.8, the small number of new temporary and permanent residents is not anticipated to place significant new demands on law enforcement agencies in the area or result in any adverse impacts. Therefore, no mitigation measures are proposed.

#### U.4.9 Fire Protection and Emergency Response

As described in Exhibit B and Section U.3.9 of this Exhibit, Facility fire protection and prevention measures will minimize the risk of potential grass fires. In his letter included as Attachment U-1, Mr. Brian Huff, states that the, “project will have a positive impact on the area, helping to reduce the hazard from wildfire.” Therefore, the Facility will not have an adverse impact on the ability of local communities to provide fire protection and emergency response services.

#### U.4.10 Health Care

As described in Section U.3.10, no significant impacts on health care services are anticipated. Therefore, no mitigation measures are proposed.

#### U.4.11 Schools

As described in Section U.3.11, no significant adverse impacts on the ability of communities to provide school services are anticipated as a result of Facility construction or operation.

### U.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.*

**Response:** The Applicant is not proposing a monitoring program related to any of its impacts because the impacts will not be significant.

### U.6 SUMMARY

The evidence provided in this Exhibit demonstrates that the Facility will not result in a significant adverse impact on the ability of the communities in the analysis area to provide the following services: sewers and sewage treatment, water, stormwater drainage, solid waste management, housing, transportation and traffic safety, police protection, fire protection and emergency response, health care, and schools.

### U.7 REFERENCES

AirNav. 2019. S33 Madras Municipal Airport, Madras, Oregon, USA. Accessed July 29, 2019. <https://www.airnav.com/airport/S33>.

Bend Bulletin. 2018. "Hotel developers plan 600 new rooms for Bend, Redmond." Accessed July 24, 2019. <https://www.bendbulletin.com/business/6906218-151/hotel-developers-plan-600-new-rooms-for-bend>.

Culver School District #4. 2019. Accessed July 23, 2019. <http://www.culver.k12.or.us/schools>.

Deschutes Valley Water District. 2017. Accessed July 23, 2019. <http://www.dvwd.org/servicearea.html>.

HotelGuides.com, Inc. 2019. Accessed July 24, 2019. <https://hotelguides.com/oregon/warm-springs-or-hotels.html>.

Jefferson County, Oregon. 2007. Jefferson County Transportation System Plan. Accessed August 1, 2019. <https://www.jeffco.net/cd/page/transportation-system-plan>.

Jefferson County, Oregon. 2018. Accessed July 24, 2019. <https://www.jeffco.net/bg/page/central-oregon-rv-park-jefferson-county-madras>.

Jefferson County, Oregon. 2019. Personal correspondence with Matt Powlison, Public Works Director. August 6.

Jefferson County School District 509-J. 2019. Accessed July 23, 2019. <https://www.jcsd.k12.or.us/schools>.

Lake Simtustus Resort. 2019. *Resort, RV Park, Tiny Homes, Marina*. Accessed July 24, 2019. <http://www.lakesimtustusresort.com/>.

Mt. View RV Park. 2019. *Home-Rates*. Accessed July 24, 2019. <https://sites.google.com/site/mtviewrvpark/home>.

Oregon Department of Environmental Quality. 2019. *DEQ Requests Comments on Crook County Landfill's Proposed Solid Waste Disposal Permit Renewal*. Accessed July 24, 2019. <https://www.oregon.gov/deq/get-involved/documents/081219crook.pdf>.

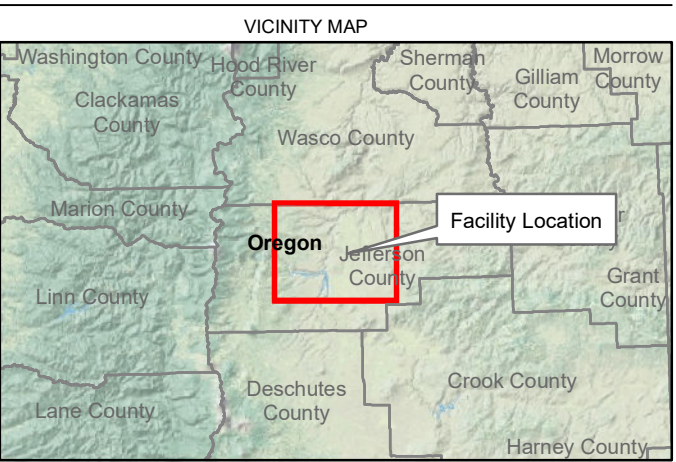
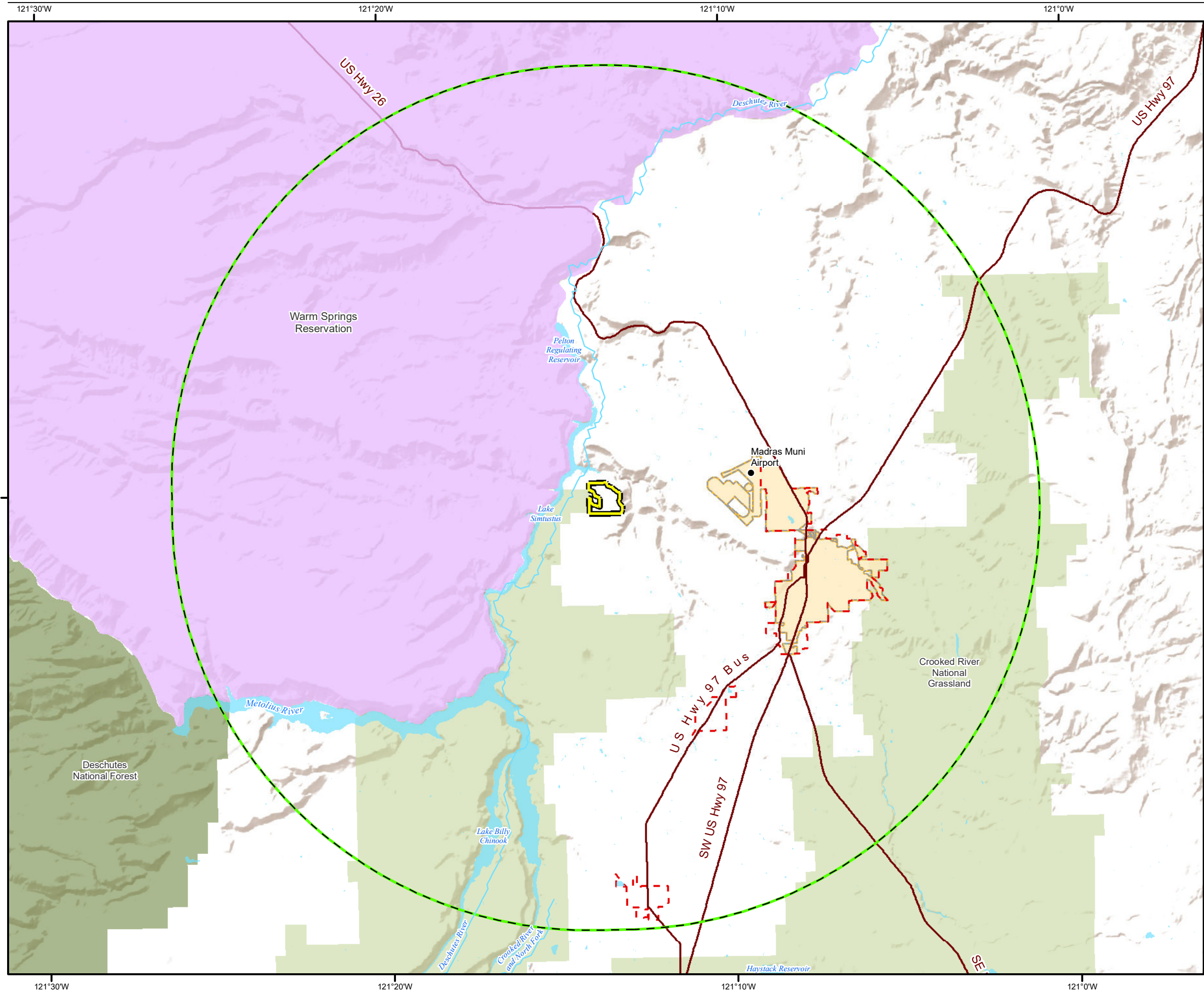
Oregon Department of Transportation (ODOT). 2014. *2013 Transportation Volume Tables*. Published by Transportation Data Section, Transportation Systems Monitoring. Accessed August 1, 2019. [https://www.oregon.gov/ODOT/Data/Documents/TVT\\_Complete\\_2013.pdf](https://www.oregon.gov/ODOT/Data/Documents/TVT_Complete_2013.pdf).

- Oregon Department of Transportation (ODOT). 2015. *2014 Transportation Volume Tables*. Published by Transportation Data Section, Transportation Systems Monitoring. Accessed August 1, 2019. [https://www.oregon.gov/ODOT/Data/Documents/TVT\\_Complete\\_2014.pdf](https://www.oregon.gov/ODOT/Data/Documents/TVT_Complete_2014.pdf).
- Oregon Department of Transportation (ODOT). 2016. *2015 Transportation Volume Tables*. Published by Transportation Data Section, Transportation Systems Monitoring. Accessed August 1, 2019. [https://www.oregon.gov/ODOT/Data/Documents/TVT\\_Complete\\_2015.pdf](https://www.oregon.gov/ODOT/Data/Documents/TVT_Complete_2015.pdf).
- Oregon Department of Transportation (ODOT). 2017. *2016 Transportation Volume Tables*. Published by Transportation Data Section, Transportation Systems Monitoring. Accessed August 1, 2019. [https://www.oregon.gov/ODOT/Data/Documents/TVT\\_Complete\\_2016.pdf](https://www.oregon.gov/ODOT/Data/Documents/TVT_Complete_2016.pdf).
- Oregon Department of Transportation (ODOT). 2018. *2017 Transportation Volume Tables*. Published by Transportation Data Section, Transportation Systems Monitoring. Accessed August 1, 2019. [https://www.oregon.gov/ODOT/Data/Documents/TVT\\_Complete\\_2017.pdf](https://www.oregon.gov/ODOT/Data/Documents/TVT_Complete_2017.pdf).
- Oregon Department of Transportation (ODOT). 2019. 2018 Pavement Condition Report. Accessed August 1, 2019. [https://www.oregon.gov/ODOT/Construction/Documents/Pavement/2018\\_condition\\_report\\_maps.pdf](https://www.oregon.gov/ODOT/Construction/Documents/Pavement/2018_condition_report_maps.pdf).
- Oregon Department of Transportation (ODOT). 2019. Road Restrictions. Accessed August 1, 2019. <https://www.oregontruckingonline.com/cf/MCAD/pubMetaEntry/restrictionsList/>.
- Oregon Department of Transportation (ODOT). 2019. *Traffic Control Plans Design Manual 14<sup>th</sup> Edition. January 1, 2019*. Accessed August 1, 2019. [https://www.oregon.gov/ODOT/Engineering/Docs\\_TrafficEng/TCP-Design-Manual.pdf](https://www.oregon.gov/ODOT/Engineering/Docs_TrafficEng/TCP-Design-Manual.pdf).
- St. Charles Health System. 2019. Accessed July 23, 2019. <https://www.stcharleshealthcare.org/Our-Locations>.
- U.S. Bureau of Labor Statistics. 2018. County Employment and Wages in Oregon – Fourth Quarter 2017. Accessed July 24, 2019. [https://www.bls.gov/regions/west/news-release/2018/countyemploymentandwages\\_oregon\\_20180726.htm](https://www.bls.gov/regions/west/news-release/2018/countyemploymentandwages_oregon_20180726.htm).
- U.S. Census Bureau. 2019a. City and Town Population Totals: 2010-2018. Accessed July 23, 2019. <https://www.census.gov/data/datasets/time-series/demo/popest/2010s-total-cities-and-towns.html#ds>.
- U.S. Census Bureau. 2019b. General Housing Characteristics. Accessed July 24, 2019. <http://factfinder.census.gov/>.

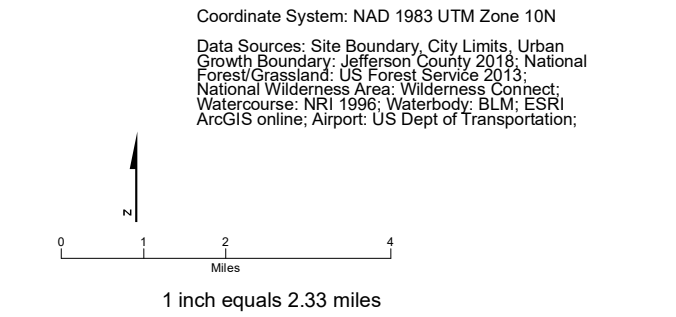
## Figures





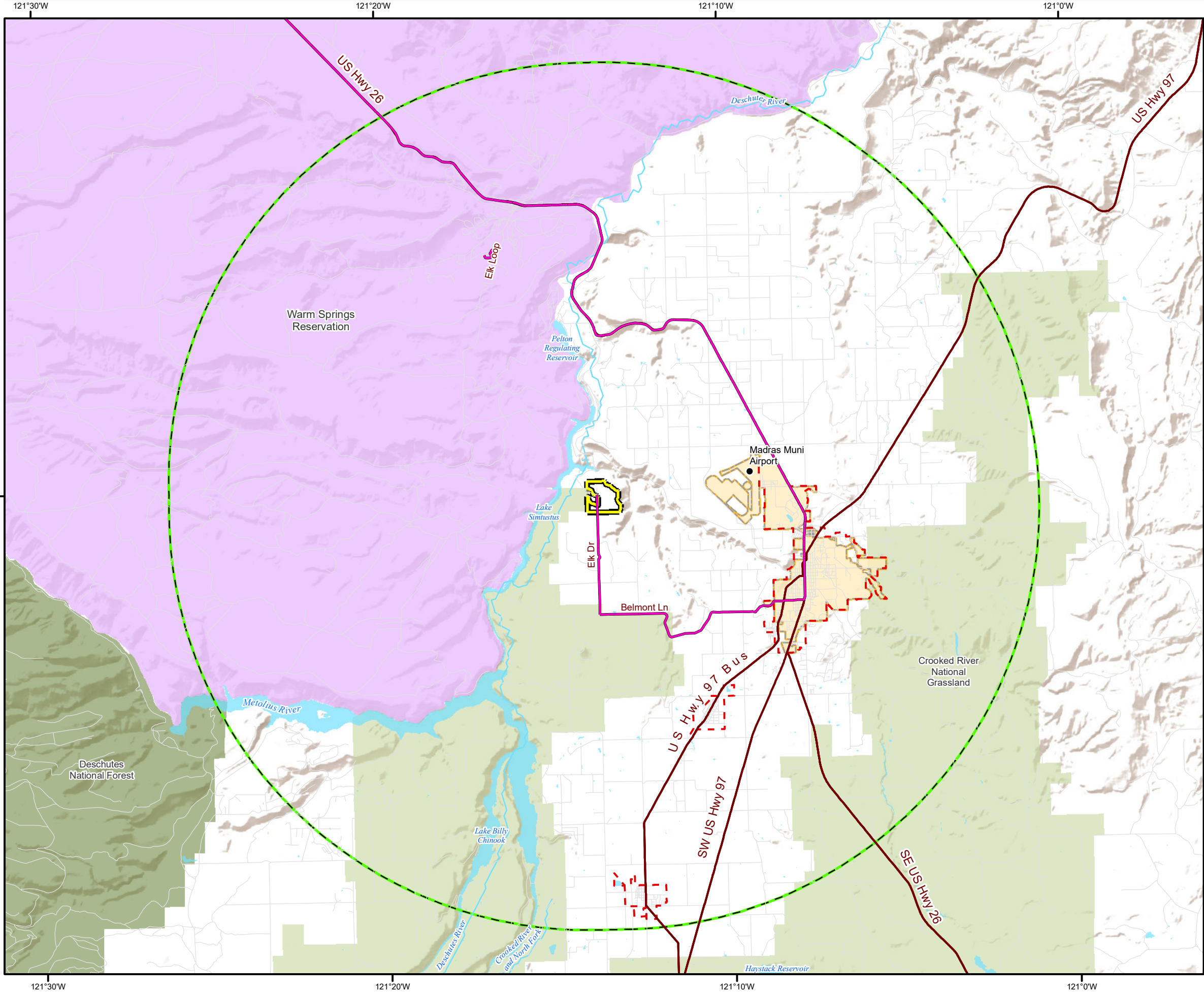


- LEGEND**
- Madras Solar Energy Facility Site Boundary
  - Public Services and Socioeconomic Impact Analysis Area (10 miles)
  - City of Madras City Limits
  - Urban Growth Boundary
  - Major Highway
  - Existing Road
  - Watercourse
  - Waterbody
  - Airport/Heliport
  - National Forest
  - National Grassland
  - Native American Land



**Figure U-1**  
Analysis Area for Public Services and Socioeconomic Impacts  
Application for Site Certificate  
Madras Solar Energy Facility  
Jefferson County, OR





- LEGEND**
- Madras Solar Energy Facility Site Boundary
  - Public Services and Socioeconomic Impact Analysis Area (10 miles)
  - City of Madras City Limits
  - Urban Growth Boundary
  - Primary Transportation Route
  - Major Highway
  - Existing Road
  - Watercourse
  - Waterbody
  - Airport/Heliport
  - National Forest
  - National Grassland
  - Native American Land

Coordinate System: NAD 1983 UTM Zone 10N  
Data Sources: Site Boundary, City Limits, Urban Growth Boundary: Jefferson County 2018; National Forest/Grassland: US Forest Service 2013; National Wilderness Area: Wilderness Connect; Watercourse: NRI 1996; Waterbody: BLM; ESRI ArcGIS online; Airport: US Dept of Transportation;

0 1 2 4  
Miles

1 inch equals 2.33 miles

**Figure U-2**  
Primary Transportation Routes  
Application for Site Certificate  
Madras Solar Energy Facility  
Jefferson County, OR



**Attachment U-1**  
**Ability of Jefferson County Fire District #1**  
**to Provide Fire Protection Services**





*"Protection of Life and Property"*

**Jefferson County Fire District #1**

765 S 5<sup>th</sup> Street – PO Box 30

Madras OR 97741

Phone: 541.475.7274

Fax: 541.475.7411

[www.jcfd-1.org](http://www.jcfd-1.org)

To: Mr. Jon Bortle

Re: Madras Solar Energy Project on Elk Dr.

Date: October 24, 2019

Mr. Bortle.

The Jefferson County Fire District #1 provides fire and emergency response services with a main fire station in Madras and a substation in Culver. The Madras Solar Energy Facility is located just outside our service district boundary. If you apply to annex the project site into our service district, we will provide fire and emergency service to the Facility. I believe this project will have a positive impact on the area, helping to reduce the hazard from wildfire.

Let me know if you have any additional questions on the annexation process.

I reviewed the proposed site plans for the project today, October 24<sup>th</sup>, 2019. As was mentioned during our meeting, it would be highly appreciated by the fire district and local residents to have a new fire hydrant which meets fire flow ratings installed by the project on Elk or at the intersection of Elk and Belmont. This will greatly improve the firefighting water supply for the area. If battery storage systems are included, we would need to conduct a site plan review of the project for compliance with fire code requirements. This may also require additional fire apparatus access and firefighting water supply for the systems.

Again, if you have any questions, concerns or need assistance with anything, please let me know.

Sincerely,

Brian Huff

Fire Chief/Fire Marshal

JCFD #1



**Attachment U-2**  
**Ability of Jefferson County Sheriff's Office**  
**to Provide Police Protection Services**





# JEFFERSON COUNTY SHERIFF'S OFFICE

**JIM ADKINS, SHERIFF**

675 NW CHERRY LANE, MADRAS, OREGON 97741

PHONE: (541) 475-6520 • FAX: (541) 475-3847

[www.co.jefferson.or.us/sheriff](http://www.co.jefferson.or.us/sheriff)

---

**To:** Paul Seilo  
Project Manager  
Jacobs  
2020 SW 4<sup>th</sup> Ave, Ste 300  
Portland, OR 97201

**From:** Jim Adkins, Sheriff

**Date:** July 19, 2019

**Re:** Proposed Madras Solar Energy Project in Jefferson County

To whom it may concern,

The Madras Solar Energy Project (Project) is located within the service area of the Jefferson County Sheriff's Office (Sheriff).

In the event of an emergency, the Sheriff's Office can provide police protection services to the Project area, located off NW Elk Drive and NW Pelton Dam Road, just south of Willow Creek Canyon.

Regards,

A blue ink signature of Jim Adkins, consisting of stylized, overlapping loops and a long horizontal stroke.

Jim Adkins, Sheriff