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Fountain Wind Project

Initial Study

Prepared for:
Pacific Wind Development, LLC
1125 NW Couch St., Suite 700
Portland, OR 97209

Prepared by:
Stantec Consulting Services Inc.

April 6, 2018

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INITIAL STUDY INFORMATION SHEET

1. **Project Title:** Fountain Wind Project

2. **Lead agency name and address:** Shasta County Department of Resource Management, Planning Division. 1855 Placer Street, Suite 103 Redding, CA 96001

3. **Contact person and phone number:** Lio Salazar, AICP, Senior Planner, 530.225.5532

4. **Project location:** The Project would be located west of the existing Hatchet Ridge Wind Farm, approximately 6 miles west of Burney, 35 miles northeast of Redding, and immediately north and south of State Route 299 East.

5. **Project sponsor's name and address:** Kristen Goland, Pacific Wind Development, LLC 1125 NW Couch Street, Suite 700 Portland, OR 97209 **Phone:** 503.478.6360

6. **General Plan designation:** Timber land (T)

7. **Zoning designation:** Timber Production (TP) and Unclassified (U)

8. **Description of Project:** The Fountain Wind Project (Project) will consist of up to 100 wind turbines and associated infrastructure, with a nameplate generating capacity of up to approximately 347 megawatts. The Project will be located on 94 Assessor parcels. In addition to the wind turbines and associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components. See Section 1.0 for a complete description of the proposed Project.

9. **Surrounding Land Uses and Setting:** The Project will be entirely within privately owned lands which are currently and would continue to operate as managed forest timberlands. An approximately 64,000-acre (100 square miles) burn scar from the Fountain Fire, which impacted the area in 1992, coincides with northern portions of the Project area. The Lassen National Forest lies adjacent to the southeast; other surrounding lands are privately owned. Communities in the vicinity of the Project include Burney, Moose Camp, Hillcrest, Wengler, Montgomery Creek, and Round Mountain.

10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):** See Section 1.6 for complete list of local, state, and federal permits/approvals required. See Appendices B and C for agencies consulted or notified.

11. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?** No. No formal consultation request was received in response to a letter sent to the Pit River Tribe on December 8, 2017.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages. The potentially significant impacts and any potential mitigation required will be addressed in the Environmental Impact Report.

☒ Aesthetics	☒ Agriculture/Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Geology/Soils
☒ Greenhouse Gas Emissions	☒ Hazards & Hazardous Materials	☒ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☒ Noise
☐ Population/Housing	☒ Public Services	☐ Recreation
☒ Transportation/Traffic	☒ Tribal Cultural Resources	☐ Utilities/Service Systems
☒ Mandatory Findings of Significance		

DETERMINATION: (TO BE COMPLETED BY THE LEAD AGENCY)

On the basis of this initial evaluation:

☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed Project MAY have a significant effect on the environment, and an environmental impact report is required.

☐ I find that the proposed Project MAY have a "potential impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

_____ _____

Signature Date

_____ _____

Printed Name For

Stantec

1.0 PROJECT DESCRIPTION

The Fountain Wind Project (Project) is a renewable wind energy generation development to be constructed and operated in eastern Shasta County, California, by Pacific Wind Development, LLC (PWD or Applicant), a subsidiary of Avangrid Renewables, LLC. The Project would consist of wind turbines and associated infrastructure, with a nameplate generating capacity of up to approximately 347 megawatts (MW).[1] The Project would be located west of the existing Hatchet Ridge Wind Farm, approximately 6 miles west of Burney, 35 miles northeast of Redding, and immediately north and south of California State Route 299 (SR 299; see Figure 1). It would be constructed within an area of approximately 37,436 acres of private land, distributed over 94 tax assessor parcels, owned by Shasta Cascades Timberlands, LLC.

The lands underlying the Project are zoned as Timber Production (TP) and Unclassified (U) under the Shasta County Zoning Plan. Shasta County Code (SCC) Section 17.08.030(D) pertains to the TP district and allows, with approval of a use permit, the construction of "gas, electrical, water, or communication transmission facility, or other public improvements, in accordance with Government Code Section 51152." Per SCC Section 17.64.040, a wind energy system is allowed with approval of a use permit in the U district as long as it is not otherwise prohibited by law and not inconsistent with any portion of the General Plan[2]. Per SCC Section 17.88.035, a Use Permit is required in all districts for wind energy systems which do not meet the definition of "small wind energy system," defined as being greater than 50 kilowatts in size. Consistency with the General Plan is further discussed in Section 2.10.

The Project would consist of up to 100 turbines, each having a generating capacity of 2 to 4 MW. The Project would also include ancillary facilities such as construction laydown areas, temporary batch plant(s) - if needed, access roads, underground and overhead collector lines, an operations and maintenance (O&M) facility, storage sheds, and substation components. The Project layout presented in Figure 2 represents proposed locations of Project infrastructure. PWD is currently conducting a number of environmental studies to collect additional site condition information (ongoing and anticipated studies are described in Section 3.0). Information gained from these studies will be used to further refine the Project layout, as appropriate, to avoid and minimize environmental impacts and meet project objectives.

[1] The nameplate generating capacity for a wind energy generation project is the sum of the total capacity rating of the turbines and should be considered a project's total potential generation output. A project's capacity factor refers to the percentage of the nameplate capacity actually generated over time.
[2] The Project is consistent with zoning as the U district lands underlying the Project are timberlands outside of the Timber Protection Zone and as such, power generation facilities are an allowed use per General Plan Policy 6.2.4, T-d.

1.1 PROJECT LOCATION AND EXISTING SITE CONDITIONS

PWD has a long-term lease of approximately 37,436 acres with Shasta Cascade Timberlands, LLC for construction and operation of the Project. This leased area is hereafter referred to as the Project area. However, all proposed Project activities would occur within the Project site, a smaller area which is currently being studied. The Project site constitutes survey corridors for the Project within which all ground-disturbing activities, both permanent and temporary, would occur and which would be occupied by permanent Project facilities.

The Project area is located in the southern end of the Cascade Range and is within the Cascades Ecological Region (USEPA 2013), which is a Level III ecoregion primarily covering parts of Oregon and Washington but also including a discontinuous land area near Mt. Shasta in California. This ecoregion is characterized by underlying volcanic rock strata and a physiography defined by recurring periods of glaciation. With high plateaus and valleys that trend east-west, this ecoregion includes steep ridges as well as both active and dormant volcanoes, and is marked by a generally mesic, temperate climate which supports productive coniferous forests. At higher elevations, subalpine meadows may occur that support unique flora and fauna. The Project area is characterized by a number of buttes and peaks separated by small valleys formed by a number of tributaries in the Pit River and Cow Creek Watersheds. Significant waterways within the Project area include the north and south forks of Montgomery Creek and Little Cow Creek. Elevations within the Project area range from approximately 3,000 to 6,600 feet.

Land ownership within the Project area is exclusively private, consisting of managed forest timberlands. An approximately 64,000-acre (100 square miles) burn scar from the 1992 Fountain Fire, which impacted the northern portions of the Project area. The Lassen National Forest lies adjacent to the southeast; other surrounding lands are privately owned. Communities in the vicinity of the Project include Burney, Moose Camp, Hillcrest, Wengler, Montgomery Creek, and Round Mountain. State Route 299 East bisects the Project area with the majority of the Project area (23,791 acres) located south of the highway. The Project area is accessible via several existing named and unnamed private roads extending from SR 299 East (Figure 2).

1.2 PROJECT OVERVIEW

This section provides an overview of each of the Project facilities. These include:

- Up to 100 turbines erected on tubular steel towers set on concrete foundations, with associated turbine pads, laydown areas, and potentially (based on turbine model) pad mounted transformers;
- A 34.5-kilovolt (kV) overhead and underground electrical collector system linking each turbine to the next and to the onsite collector substation;
- An overhead and underground communication system (fiber optic cabling) adjacent to the electrical collector system;

- An onsite collector substation and switching station for connecting the Project to the existing Pacific Gas and Electric Company (PG&E) transmission line;
- Access roads, consisting of existing and new roads;
- A temporary, 10-acre construction and equipment laydown area, construction trailer area, and associated parking area;
- Seventeen temporary, 2-acre laydown areas distributed throughout the Project site;
- An O&M facility including an operations building and outdoor storage area;
- Permanent meteorological (MET) towers and one Sonic Detection and Ranging unit or one Light Detection and Ranging unit;
- Storage sheds; and
- Temporary batch plant(s) - if needed.

Typical dimensions and disturbance areas for each Project component are provided in Table 1-1. The proposed Project layout is shown in Figure 2.

Table 1-1. Project Facilities and Disturbance Areas

Project Component	Quantity	Typical Area of Construction Soil Disturbance (Total)	Typical Area of Permanent Disturbance (Fill/Structures/Grading)[1]
Turbines and pads (incl. construction laydown areas)	Up to 100	5 acres per turbine	2.5 acres per turbine [2]
Underground electrical collector system [3]	Up to 56 miles	50-foot-wide per linear foot	30-foot-wide corridor maintained clear of large vegetation where it deviates from paralleling access roads
Overhead electrical collector line (including roads for construction, pull points, and pole construction) and 2-track road to access during operations [4]	Up to 16 miles	100-foot-wide per linear foot	50-foot-wide right-of-way per linear foot cleared of large vegetation
Onsite collector substation and switching station	1	25 acres	collector substation – 5 acres switching substation – 15 acres
Access roads (includes crane roads)[5]	Up to 21 miles of new roads Current layout shows 87 miles of existing roads that	40.0-foot-wide per linear foot drivable surface and nominally 80.0-foot-wide for construction clear area	20-foot-wide per linear foot with a 1-foot shoulder on both sides and nominally up to an additional 6-feet on either side where required for storm water drainage design

Project Component	Quantity	Typical Area of Construction Soil Disturbance (Total)	Typical Area of Permanent Disturbance (Fill/Structures/Grading)[1]
	may potentially be used		
O&M facility	1	5 acres	5 acres, with 5,460-square foot O&M Building
Operations storage sheds	2	NA (located in temporary laydown areas)	0.5 acres
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0.0 acres
Temporary laydown areas	17	2 acres per laydown area	0.0 acres
Temporary batch plant, if necessary	2	3 to 5 acres	0.0 acres
MET towers	2	1 acre per structure	0.1 acres
Anticipated Total Construction Disturbance 2,167 acres			
Anticipated Total Permanent Disturbance 972 acres			

1. Permanent impact acreages are a subset of total impacts.
2. Includes defensible fire space around each turbine.
3. Portions of the electrical collector system would be within the access road construction buffer; no additional permanent impacts would occur in these areas. Note that acreage includes co-located underground communications system (cabling)
4. For impact calculations assumed a 7-foot-wide corridor centered on the transmission line; actual impacts would be less and limited to pole and pull site locations. Note that acreage includes co-located overhead communications system (cabling)
5. Acreage includes both existing and new road segments.

1.2.1 Wind Turbines

PWD is currently considering a range of turbine models from leading manufacturers, varying in generating capacity and dimensions. Models selected for the project would in combination meet the desired approximately 347 MW nameplate generating capacity of the Project. The final turbine model and specific number of turbines will be selected based on availability at time of construction, conformance with PG&E grid requirements, onsite wind resources, and other Project-specific factors.

The turbines would be three-bladed, horizontal-axis models, meaning that the rotor shaft and nacelle, which houses the electrical generator, are mounted at the top of a tubular tower, and must be pointed into the wind. Turbine towers would be mounted on a concrete pedestal supported by a permanent concrete foundation. Turbine models being considered range in height; however, none will exceed a maximum height at the top of the blade of 591 feet above ground level. Turbine dimensions representative of models under consideration are shown in

Figure 3. Each turbine will require a step-up transformer which would either be housed within the turbine nacelle or approximately 5 feet from the tower foundation on a reinforced concrete box pad, approximately 9 by 9 feet.

A Federal Aviation Administration (FAA) approved lighting plan would be developed for the Project. This plan would specify the installation of flashing red lights on designated turbines and met towers to improve nighttime visibility for aviation.

A temporary construction work area, or turbine pad, would be cleared and graded for each turbine. Work areas vary in size, and would be constructed differently in keeping with each turbine site's topography. A typical turbine pad is shown in Figure 4. Although turbine pad size and configuration would vary depending on terrain, each turbine pad would require an approximately 200-foot by 250-foot area that is cleared and leveled to approximately 2 percent slope or less. The cleared area is necessary for foundation excavation and construction, assembling the turbine, and also to stage the construction crane which would hoist turbine sections into place. Additional area would be needed for rotor assembly depended upon site conditions and installation. The turbine construction area would not be paved. A compacted-soil crane pad would be located within the 200-foot by 250-foot turbine pad area; however, the actual crane pad size and location would be determined by the contractor in the field. The crane pad would provide a soil bearing capacity designed to provide a stable foundation for the crane and would be left in place post construction.

Turbine foundations will likely be spread footing and specifically designed as determined by geotechnical investigations. Spread footings, would be primarily buried underground to a depth of approximately 10 to 15 feet with a pedestal extending approximately 1 foot above ground. The base would be approximately 50 to 80 feet in diameter, depending on the turbine model selected. Prior to finalizing the location of each turbine, soil borings would be collected to verify soil and rock characteristics to an approximately 50-foot depth to ensure sufficient soil strength and bearing capacity to provide a stable foundation for the turbine.

Once construction is completed, a permanent 15-foot gravel ring would be placed around the base of the foundation. The gravel would provide a stable surface area for maintenance vehicles, and would minimize surface erosion and runoff. All temporarily impacted areas would be replanted with non-aggressive resident species that are compatible with wind farm operations, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere. This would be conducted in accordance with the Shasta County Fire Department, per a project-specific Fire Management Plan developed in concert with the Shasta County Fire Department.

1.2.2 Electrical Collector System and Communications System

Power generated by the turbines would be collected by an electrical collector system which would consist of both aboveground and underground 34.5-kV power lines. This system would feed into an onsite collector substation, which would step up the voltage and transmit the

power to the point of interconnect with the PG&E transmission system. The majority of the collector system would be located underground and installed adjacent to the onsite access road bed where possible. Where necessary, portions of the collector system would be above ground to transmit power that would otherwise require multiple underground cables, respond to construction challenges or to avoid environmental impacts. These include:

- Corridors where it is necessary to transmit more than 20 to 25 MW, which exceeds the capability of an underground cable.
- Steep terrain, where the use of backhoes and trenching machines is infeasible or unsafe;
- Stream and wetland crossings, where an aboveground line can avoid or minimize environmental impacts;
- The presence of cultural resources, where an aboveground line can avoid or minimize impacts; and
- The presence of soils with low thermal conductivity (preventing adequate heat dissipation from the conductor) or rocky conditions that significantly increase trenching costs.

For the underground portions of the electrical collector system, cables would be directly buried in trenches and would terminate at individual turbines, at locations where they connect to junction boxes, overhead power lines, or at the onsite substation. Depending on the subsurface conditions, the need for blasting is not expected but may be required to install the trenches. Each trench would contain power cables, a ground wire, a fiber optic communication cable for the Supervisory Control and Data Acquisition (SCADA) system (to transmit data from the turbine controllers to the onsite substation and O&M facility) and a marker tape above the cables to alert anyone digging in the area. Although designs have not been finalized, PWD anticipates that the underground collector cable system would be placed within a 46-inch-deep and at least 12-inch-wide cable trench generally located along the length of the proposed turbine access roads. Typical cable trench details used for construction of the underground electrical system are shown in Figure 5.

Where the underground collector system would be co-located with access roads no additional ground disturbance would occur in association with construction of the underground electrical collection system (i.e., disturbance is accounted for in association with the access roads). In areas where the underground collector system trenches are not able to be co-located with access roads, up to a 50-foot-wide temporary disturbance area would be required. Underground portions of the collector system would have no permanent impacts; however, a 30-foot-wide corridor would be maintained clear of large vegetation where underground collector lines deviate from paralleling access roads.

Above ground portions of the electrical collector system would have a maximum pole height of 90 feet and wire heights ranging from 20 to 30 feet above the ground unless special circumstances warrant different clearances. This will not be known until final construction

drawings are completed. Clearing for installation of the overhead collector line would require a temporary workspace consisting of an approximately 100-foot-wide corridor centered on the overhead line, within which a 50-foot-wide corridor would remain permanently disturbed with low vegetation and two track access for maintenance. However, actual permanent impacts would be considerably less, limited to individual pole locations. PWD would design all aboveground collector lines in accordance with the Avian Protection Plan Guidelines prepared by the U.S. Fish and Wildlife Service (USFWS; USFWS 2005) and the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC 2012). All temporarily impacted areas would be replanted with non-aggressive resident species that are compatible with wind farm operations, such as short, native, slow-growing shrubs. A Habitat Restoration Plan and Vegetation Management Plan will be developed prior to construction. Typical overhead electrical collector pole design is shown in Figure 6.

1.2.3 Onsite Collector Substation and Switching Station

The onsite collector substation and switching station would increase the voltage of the electricity from the 34.5 kV collection system voltage to 230 kV, the same voltage as the existing PG&E 230-kV line. The switching station would be co-located with the substation and would facilitate the interconnection of the Project's electricity to the PG&E transmission line. Approximately 25 acres would be needed for construction of the substation and switching station. The final permanent footprint of the substation and switching station site would be approximately 5 acres for the collector station and 15 acres for the switching station and consist of a graveled area, fence, and parking area for maintenance vehicles.

1.2.4 Access Roads

Access to the Project site would be provided from SR 299 onto existing logging roads. Internal Project access would be facilitated by the addition of new roads and the use of existing, privately owned logging roads, which would be improved as needed and widened to meet construction and maintenance activity requirements. Existing roads will be used to the extent possible. For the purpose of estimating maximum potential impacts, this discussion assumes the same level of disturbance for all Project access roads.

During construction, select portions of existing roads within the Project site would be widened to, and new access roads would be constructed to, approximately 40-foot drivable surface with 20 feet on each side for cut, fill, and construction, for a nominal 80-foot-wide total disturbance area. The road surface would be a graded and graveled all-weather surface. Based on the preliminary layout shown in Figure 2, PWD anticipates road modifications would be needed for portions of private logging roads off of SR 299, to accommodate turbine component delivery and other large delivery trucks, potentially including cranes and other heavy construction equipment. However, the road layout may be modified as the Project design is refined to maximize use of existing roads.

As required, existing culverts would be replaced with wider or stronger culverts. For both new and existing roads, drainage improvements would be made in accordance with the Project's erosion control plan pursuant to the Project's National Pollution Discharge Elimination System (NPDES) permit. Figures 7a and 7b show typical road designs. For more information on cut and fill, grading, blasting and culvert locations see Section 1.3.

During operation, service vehicles and equipment would continue to use Project access roads for routine maintenance activities. Permanent access road widths would be reduced to 20-feet-wide drivable surface with a 1-foot shoulder on both sides and nominally up to an additional 6-feet on either side where required for stormwater drainage design. However, in areas where significant cuts and fills were required to construct the road, permanent disturbance may be as wide as 60 feet to accommodate stormwater controls and road design. Permanent access roads would be maintained through periodic grading and compacting to minimize naturally occurring erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.

1.2.5 Temporary Construction and Equipment Area, Construction Trailer Area, Associated Parking Area, and O&M Facility

The temporary construction and equipment area, construction trailer area, and associated parking area would consist of an approximately 10-acre compacted gravel pad on a cleared and graded footprint (Figure 2). During construction, this area would be used to store large equipment and materials, to refuel equipment, and to collect and temporarily store construction waste. It would also serve to provide temporary parking, construction office space, and temporary (portable) sanitary facilities. Refueling of construction vehicles would be accomplished by a vendor supplied fuel truck making daily or weekly deliveries to approved storage tanks. It would not be practical to remove construction equipment from the wind farm site for refueling and general maintenance such as changing fluids and lubricating parts; therefore, these activities would take place onsite and some fuel will be stored onsite. Following construction, portions of the construction staging and equipment laydown area not used for permanent O&M facilities would be restored to pre-construction conditions through the removal of gravel and replanted with non-aggressive resident plant species that are compatible with Project operation, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere.

The O&M facility and its associated storage yard and parking area would consist of a permanent 5-acre area which may be located near the SR 299 (Figure 2). Figure 8a, 8b, and 8c include a typical plan and profile of the O&M building. During Project operation, large equipment required for maintenance could be staged in the O&M storage yard.

Water for the O&M facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Any efforts to install a domestic well would be conducted in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division.

Wastewater from the O&M facility would be processed using an on-site septic system. This system would conform to all County design standards and specifications to avoid impacts on ground- or surface waters.

1.2.6 Temporary Laydown Areas

Construction activities would require 17 two-acre laydown (staging) areas, located throughout the Project site to store and stage building materials and equipment. The laydown areas may be graveled depending upon site soil conditions. The temporary laydown areas would be removed upon completion of construction and replanted with non-aggressive resident species that are compatible with wind farm operations, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere. Location of the staging areas will be based on further refinement of the site layout.

1.2.7 Temporary Wind Resource Remote Sensing Devices

Doppler effect instruments would be temporarily placed within the Project site to supplement wind resource data gathered by permanent meteorological towers (see following section). These ground-based instruments record ranges of wind resources using laser-based light detection and ranging (LiDAR) and sound detection and ranging (SODAR). Instruments, which are mounted to trailers and which would be transported to the Project site by pick-up truck, would be removed prior to construction.

1.2.8 Permanent Meteorological Towers

Two permanent MET towers would be constructed in the Project site, and existing temporary MET towers would be removed. These towers support instruments that measure and record weather data to assess performance of turbines and guide Project operation. The MET towers would be up to 316 feet tall (Figure 9). Permanent MET towers are typically at the hub height of the turbine selected. Permanent MET towers 200 feet or taller would comply with FAA lighting regulations. All new permanent meteorological towers would be freestanding structures without guy wires to minimize impacts on avian species.

In addition, trailer-mounted SODAR and LiDAR units may be deployed on the Project site to further study wind speed, direction, and turbidity. Both SODAR and LiDAR units are typically mounted on a small utility trailer and can easily be moved using a standard pickup truck. No ground disturbing activity would occur during SODAR and/or LiDAR deployment or use.

1.3 CONSTRUCTION ACTIVITIES

1.3.1 Grading

Ground-disturbing activities including clearing and grubbing, topsoil stripping, grading, compaction, utility trenching, and placement of aggregate surfacing would occur during the construction of the Project. Grading activities would consist of the removal, storage, and/or

disposal of earth, gravel, vegetation, organic matter, loose rock, and debris. The cut and fill required for the Project would be balanced to the extent possible, to minimize the amount of materials that would need to be brought onto or removed from the site. Estimates of cut and fill cannot be determined until engineering for construction has been undertaken.

A site-specific Storm Water Pollution Prevention Plan (SWPPP) would be prepared for the Project. The SWPPP would identify best management practices (BMPs) that would be used to minimize or eliminate the potential for sediments and pollutants to reach surface waters through storm water runoff. To minimize impacts associated with soil erosion, PWD would prepare a Temporary Erosion and Sediment Control (TESC) Plan that would be implemented by the construction contractor. The TESC Plan would include standard storm water BMPs to reduce the risk of erosion.

To the extent practicable, the Project would maintain the local surface drainage patterns. New Project access roads would be designed to follow natural contours and minimize side hill cuts to the extent possible and would include other BMP such as ditches and culverts to capture and convey storm water runoff. Additionally, with the exception of areas where permanent surface recontouring is required, disturbed areas would be restored to pre-existing grades and all disturbed areas where permanent gravel or aggregate is not required would be revegetated. These measures would reduce the potential for erosion and adverse effects on drainage patterns.

In rocky areas, blasting may be necessary to loosen rock before excavation. If blasting is necessary, a Blasting Plan would be prepared to identify the locations that are anticipated to require blasting. All applicable federal, state, and local regulations for blasting procedures would be identified in the Blasting Plan and would be followed. Explosives would only be used within specified times and at specified distances when the work is located within or nearby sensitive habitat areas.

1.3.2 Transportation of Turbine Components

Turbine components may be transported to the Project area by highway transportation and assembled on site. Each turbine would require multiple deliveries. The specifics of these deliveries would depend upon the final turbine model selected; however, PWD anticipates that each turbine would require up to 15 separate loads, of equipment and materials to its pad, of which eight or nine would be oversized or superloads transporting turbine components. Towers are generally delivered in three, four, or five sections (depending on turbine selected). Each turbine blade, nacelle, rotor, and down-tower components (e.g., controllers, ladders and platforms, pad-mount transformers, pad-mounted transformer vaults, and turbine switchgear) would be delivered separately. Deliveries would be made using transport vehicles that conform to road weight limits; any variances would be incorporated into permits submitted to the California Department of Transportation (Caltrans). A Traffic Assessment Report would be prepared prior to finalization of the Draft Environmental Impact Report.

1.3.3 Construction Schedule and Workforce

The Project construction period is expected to last 18 to 24 months. Construction would be completed during daylight hours, typically from 7am to 5pm but may be earlier or later during the summer months. There may be other circumstances where these hours need to be extended earlier or later, such as during the delivery of superloads, and nighttime construction may occur to avoid traffic, adjust for high winds during daylight hours, and to facilitate schedule. The construction workforce is estimated to include up to 400 construction workers at any given time.

1.3.4 Construction Sequence

During the initial phase of Project construction, access roads would be established. This includes the widening of existing access roads where necessary and construction of new access roads. Temporary staging and laydown areas would also be established to serve as temporary storage for the tower sections, nacelles, blades, and other Project components.

Turbine laydown areas would be cleared including an area of approximately 5 acres (depending on the terrain) at each turbine for the crane pad, construction laydown area, and rotor assembly area. Within the graded turbine laydown area, a gravel pad would be established for supporting a crane to be used to erect the towers and turbines. Prior to construction of the turbine foundations, soil samples would be collected during the pre-construction and construction geotechnical investigation to assist in determine site-specific turbine foundations to be utilized during final engineering.

Once the foundations are constructed, the turbines would be assembled and erected using a combination of forklifts and construction cranes, located on the compacted earthen or gravel crane pad. Construction equipment requiring access to these areas would include both wheeled and tracked vehicles. Cranes used to assemble the turbine components would be delivered to the wind farm site in multiple loads and assembled on site.

While turbines are being installed, construction of the substation, underground and overhead collection system, and O&M building would occur. Once all facilities are constructed, final testing would occur to ensure all systems are working property and according to design. Also, as construction is completed, the temporarily used portions of the construction staging and equipment laydown areas, turbine pad laydown areas, and access roads would be restored to pre-construction conditions through the removal of gravel and replanted with non-aggressive resident plant species that are compatible with Project operation, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere.

Throughout construction, erosion control procedures would be implemented in accordance with the NPDES permit and the associated SWPPP and TESC. A final site cleanup, including removal of all waste materials, would also be conducted.

1.3.5 Use of Hazardous Materials

Hazardous materials are required during construction and operation of wind energy generation projects. Table 1-2 summarizes materials typically used for such projects, with details about their use and typical quantities.

Table 1-2. Hazardous Materials Associated with Typical Wind Energy Generation Projects

Hazardous Material	Uses	Typical Quantities Present
Fuel: diesel fuel [a]	Powers most construction and transportation equipment during construction and decommissioning phases. Powers emergency generator during operational phase.	The Project estimate is over 5,000 gallons to be stored in aboveground tanks during construction. An unknown amount would be used during decommissioning. [b]
Fuel: gasoline [c]	Used for some construction equipment and transportation vehicles	Because of the limited number of construction and transportation vehicles utilizing gasoline, no onsite storage is likely to occur throughout any phase of the Project.
Fuel: propane [d]	Most probable fuel for ambient heating of the control building	Typically, 500 to 1,000 gallons stored in an aboveground propane storage vessel.
Lubricating oils/grease/hydraulic fluids/gear oils	Lubricating oil is present in some wind turbine components and in the diesel engine of the emergency power generator.	Limited quantities stored in portable containers (capacity of 55 gallons or less); maintained onsite during construction and decommissioning.
	Maintenance of fluid levels in construction and transportation equipment.	Limited quantities stored in portable containers (55 gallons or less); stored onsite during operational phase.
	Hydraulic fluid is used in the rotor driveshaft braking system and other controls.	
	Gear oils and/or grease are used in the drivetrain transmission and yaw motor gears.	
Glycol-based antifreeze	Present in some wind turbine components for cooling (e.g., 5 to 10 gallons present in recirculating cooling system for the transmission).	Limited quantities (10 to 20 gallons of concentrate) stored onsite during construction and decommissioning.
	Present in the cooling system of the diesel engine for the emergency power generator.	Limited quantities (1 to 10 gallons of concentrate) stored onsite during operational phase.
Lead-acid storage batteries and electrolyte solution	Present in construction and transportation equipment.	Limited quantities of electrolyte solution (<20 gallons) for maintenance of construction and transportation equipment during construction and decommissioning.

Hazardous Material	Uses	Typical Quantities Present
	Backup power source for control equipment, tower lighting, and signal transmitters.	
Other batteries (e.g., nickel-cadmium batteries)	Present in some control equipment and signal-transmitting equipment.	No maintenance of such batteries is expected to take place onsite.
Cleaning solvents	Organic solvents (most likely petroleum-based but not listed under the Resource Conservation and Recovery Act) used for equipment cleaning and maintenance.	Limited quantities (<55 gallons) onsite during construction and decommissioning to maintain construction and transportation equipment.
	Where feasible, water-based cleaning and degreasing solvents may be used.	Limited quantities (<10 gallons) onsite during operations.
Paints and coatings [e]	Used for corrosion control on all exterior surfaces of turbine towers.	Limited quantities for touch-up painting during construction (<50 gallons) and for maintenance during operations (<20 gallons).
Dielectric fluids [f]	Present in electrical transformers, bushings, and other electric power management devices as an electrical insulator.	Some transformers may contain more than 500 gallons of dielectric fluid. Onsite transformers each contain approximately 10,000 gallons of mineral oil.
Explosives	May be necessary for excavation of tower foundations in bedrock.	Limited quantities equal to only the amount necessary to complete the task.
	May be necessary for construction of access and/or onsite roads or for grade alterations.	Onsite storage expected to occur only for limited periods of time as needed by specific excavation and construction activities.
Herbicides	May be used to control vegetation around facilities for fire safety.	If deemed necessary, herbicides would likely be brought to the site and applied by a licensed applicator.

Adapted from "Typical" windfarm equipment lists

Notes:

[a] It is assumed that commercial vendors would replenish diesel fuel stored onsite as necessary.

[b] This value represents the total onsite storage capacity, not the total amount of fuel consumed (see footnote a, above). Onsite fuel storage during construction and decommissioning phases would likely be in aboveground storage tanks with a capacity of 500 to 1,500 gallons. Tanks may be of double-wall construction or may be placed within temporary, lined earthen berms for spill containment and control. At the end of construction and decommissioning phases, any excess fuel, as well as the storage tanks, would be removed from the site, and any surface contamination resulting from fuel handling operations would be remediated.

[c] Gasoline fuel is expected to be used exclusively by on-road vehicles (primarily automobiles and pickup trucks). These vehicles are expected to be refueled at existing offsite refueling facilities.

[d] Delivered and replenished as necessary by a commercial vendor.

[e] It is presumed that all wind turbine components, nacelles, and support towers would be painted at their respective points of manufacture. Consequently, no wholesale painting would occur onsite; only limited amounts would be used for touch-up purposes during construction and maintenance phases. It is further assumed that the coatings applied by the manufacturer during fabrication would be sufficiently durable to last throughout the equipment's operational period and that no wholesale repainting would occur.

[f] It is assumed that transformers, bushings, and other electrical devices that rely on dielectric fluids would have those fluids added during fabrication. However, very large transformers may be shipped empty and have their dielectric fluids added (by the manufacturer's representative) after installation. It is further assumed that servicing of electrical

Hazardous Material	Uses	Typical Quantities Present
	devices that involves wholesale removal and replacement of dielectric fluids would not likely occur onsite and that equipment requiring such servicing would be removed from the site and replaced. New transformers, bushings, or electrical devices are expected to contain mineral oil-based, or synthetic dielectric fluids that are free of polychlorinated biphenyls. Some equipment may instead contain gaseous dielectric agents (e.g., sulfur hexafluoride) rather than liquid dielectric fluids.	

1.4 OPERATIONS AND MAINTENANCE ACTIVITIES

PWD anticipates employing up to 12 full-time employees upon commencing commercial operation of the Project. Technician staffing is commensurate with site needs which are primarily driven by turbine type. Operation and maintenance activities would generally occur during normal work day hours from Monday to Friday with call outs 7 days a week after normal business hours. Avangrid Renewables National Control Center located in Portland, Oregon would monitor and control the turbines through the SCADA monitoring system 24 hours a day, seven days a week. The system would perform self-diagnostic tests and allow a remote operator to set new operating parameters, perform system checks, and ensure turbines are operating at peak performance. Turbines would automatically shut down if sustained winds or gusts exceed predetermined maximum operating parameters.

On-site equipment during Project operation would include utility vehicles and other equipment that are necessary for operation and maintenance activities. Each turbine would be serviced periodically (e.g., twice a year), or as needed. Typical turbine servicing activities may include temporarily deploying a crane within the construction easement of each turbine, removing the turbine rotor, replacing generators, bearings, and deploying personnel to climb the towers to service parts within the turbine.

The Project would develop and implement a Fire Protection Plan (FPP) prior to construction and operation. The FPP will include emergency response and evacuation procedures that would include immediate reporting notification of local fire agencies. Staff would be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire.

Environmental monitoring would be conducted in accordance with the approved mitigation and monitoring plan. This may include avian monitoring surveys and monitoring to ensure maintenance of erosion control measures.

The anticipated operational life of the Project is 40 years. After that time, PWD would evaluate whether to continue operation of the Project or to decommission it in accordance with the Decommissioning Plan.

1.5 PROJECT DECOMMISSIONING

If, at the end of its anticipated life, the Project is decommissioned, the goal of decommissioning would be to remove the power generation equipment and return the site to a condition as close

to its pre-construction state as possible. A Draft Decommissioning Plan would be prepared prior to operations. It is anticipated that requirements in effect at the time of decommissioning would require that all turbines and ancillary structures be removed from the site. The plan would be revised prior to the termination of the Shasta Cascades Timberlands, LLC land lease and implemented once the Project has ceased operation. The Final Decommissioning Plan would be developed in compliance with the standards and requirements for closing a site at the time decommissioning occurs.

When the facility is decommissioned, the turbine components would be removed from the site and the materials would be reused, recycled, or sold for scrap. Decommissioning activities are anticipated to have similar types of construction-related activities. Therefore, all management plans, BMPs, and stipulations developed for the construction phase of the Project would be applied to the decommissioning phase of the Project. Topsoil from all decommissioning activities would be salvaged and reapplied during final reclamation to the extent possible. Working with the land owner, all disturbed soil will be replanted with trees. The vegetation cover, composition, and diversity would be restored to values commensurate with the area's ecological setting. A Decommissioning Plan will address the following procedures: facility dismantling and removal, site restoration, habitat restoration, monitoring and estimated costs.

1.6 REQUIRED APPROVALS AND PERMITS

The county, state, and federal permits that may be required for the Project are listed in Table 1-3 below.

Table 1-3. Approval and Permits Potentially Required for the Proposed Project.

Jurisdiction	Permit or Approval
County	Shasta County Use Permit
	Shasta County Building Division – building and grading permits
	Department of Resource Management Environmental Health Division – Hazardous Materials Business Plan
	Department of Resource Management Environmental Health Division—septic system permit
	Department of Resource Management Environmental Health Division—well permit
State	California Department of Forestry & Fire Protection—timberland conversion permit
	California Department of Transportation Division of Aeronautics—permit required per PUC Section 21656
	California Department of Fish and Wildlife (CDFW) Incidental Take Permit under California Environmental Species Act (CESA) Section 2081
	CDFW Notification of Lake or Streambed Alteration under Fish and Game Code Section 1602 CDFW Lake or Streambed Alteration Agreement under Fish and Game Code Section 1603

Jurisdiction	Permit or Approval
	Shasta County Air Quality Management District Authority to Construct and Permit to Operate for proposed concrete batch plants
	California Regional Water Quality Control Board—NPDES General Construction Permit, CWA Section 401 Water Quality Certification
Federal	Federal Energy Regulatory Commission—approval to be an Electric Wholesale Generator and to sell electricity at market-based rates
	Federal Aviation Administration—notice of proposed construction, includes Department of Defense screening for military flight path conflict
	USFWS Incidental Take Permit under Section 10 of the Federal Endangered Species Act
	Consultation under Section 106 of the National Historic Preservation Act of 1966 (NHPA) including the preparation of a Cultural Resources Report consistent with Section 106 of the NHPA and Section 15064.5 of California Code of Regulations related to CEQA and Historic Resources.
	US Army Corps of Engineers Nationwide or Individual permit under CWA Section 404

2.0 ENVIRONMENTAL CHECKLIST

Evaluation of Environmental Impacts within the Initial Study

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is a potential impact (to be further discussed in the EIR), less than significant with mitigation (to be further discussed in the EIR), or less than significant. "Potential Impact" is appropriate if there is substantial evidence or sufficient public concern that an effect may be significant. If there are one or more "Potential Impact" entries when the determination is made, an EIR is required.
4) Negative Declaration: "Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potential Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level.
5) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
6) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
7) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
8) The explanation of each issue should identify:
   a) The significance criteria or threshold, if any, used to evaluate each question; and
   b) The mitigation measure identified, if any, to reduce the impact to less than significance.

2.1 AESTHETICS

AESTHETICS Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

a) Have a substantial adverse effect on a scenic vista?

Finding: Potentially Significant Impact

The turbines, with heights of up to 591 feet, would be the primary source of long-term visual impact from the proposed Project. The turbines would be taller than the surrounding vegetation. Given the height of the turbines, their placement on ridgelines, and the rural nature of the Project area, the turbines would be visible from certain viewpoints. Views of the turbines from some viewpoints are expected to not be avoidable because of their size and exposed location. Visibility of the turbines would be blocked or partially obscured by topography in some locations, however, and could be diminished in other locations because of factors such as distance from viewers, the angle of observation, atmospheric conditions, and the presence of vegetation and/or structures. A viewshed analysis will be conducted to identify the areas from which at least a portion of one or more turbines would potentially be visible, based on line-of-sight conditions determined by topography.

In addition to the size, form, and color of the turbines, another source of visual contrast from the operation of the Project would be the introduction of motion into a static landscape. The oscillating motion of turbine blades often draws the eye of potential viewers and creates more contrast than does a static structure of similar size and form. Other Project facilities that would have relatively limited visual impact would be access roads, electrical collection and communication networks, substation and two permanent meteorological towers. These features would be much smaller and would generally create much less visual contrast than the turbines.

At nighttime, the substation and the turbines would be minimally lit in accordance with the FAA. This would create a new light source in the wind farm site. Much like the motion of the blades

during daytime operations, the blinking safety lights can draw the attention of a casual observer.

Although the change in visual character is not anticipated to be significant, preliminary review merits further evaluation. Therefore, this potential impact will be fully analyzed and evaluated in the EIR. A Visual Resources Technical Report, to be incorporated into the EIR, will be prepared in Spring 2018.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Finding: Potentially Significant Impact

There are no roadways in or near the Project area that are designated in federal or state plans as a scenic highway or route worthy of protection for maintaining and enhancing scenic viewsheds. However, SR 89, located approximately 11 miles east of the Project area, and SR 44, located approximately 18 miles south of the Project area, are designated as Eligible State Scenic Highways. Also, Section 6.8, Figure SH-1 of Shasta County's General Plan designates the Hatchet Ridge Summit on SR 299 as a "Gateway or location that marks the entrance to a community of geographic area" (Shasta County 2004). Additionally, SR 299 from Bella Vista east to the Hatchet Ridge Summit gateway and SR 44 from Old Station to Millville is considered a "corridor in which the natural environment is dominant" and SR 299from the Hatchet Ridge Summit gateway to Burney is a "corridor in which natural and manmade environment contrast" (Shasta County 2004).

The proposed Project would likely not be visible from the majority of the Hatchet Ridge Summit due to existing coniferous vegetation limiting views from SR 299; however, the proposed Project may be visible from viewpoints further away along SR 299 to both the east and west. The proposed Project may also be visible from certain viewpoints along SR 89. Further investigation and analysis will need to be conducted to assess the visibility of the proposed Project and to assess the potential impacts to the viewshed. Therefore, this potential impact will be fully analyzed and evaluated in the EIR. A Visual Resources Technical Report, to be incorporated into the EIR, will be prepared in Spring 2018.

c)Substantially degrade the existing visual character or quality of the site and its surroundings?

Finding: Potentially Significant Impact

Given the height of the turbines, their placement on ridgelines, and the rural nature of the Project area, the turbines would be highly visible from certain viewpoints. Views of the turbines could not be avoided because of their size and exposed location. Visibility of the turbines would be blocked or partially obscured by topography in some locations, however, and could be diminished in other locations because of factors such as distance from viewers, the angle of

observation, atmospheric conditions, and the presence of vegetation and/or structures. A viewshed analysis will need to be conducted to identify the areas from which at least a portion of one or more turbines would potentially be visible, based on line-of-sight conditions determined by topography. Therefore, this potential impact will be fully analyzed in the EIR. A Visual Resources Technical Report, to be incorporated into the EIR, will be prepared in Spring 2018.

d)Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Finding: Potentially Significant Impact

Pursuant to 14 CFR 77, temporary or permanent structures higher than 200 feet above mean sea level or exceeding any obstruction standards should generally be marked or lighted. In compliance with FAA regulations, the turbines would be equipped with synchronized red flashing lights to satisfy FAA marking and lighting requirements.

Due to the nature of the proposed Project, views of the turbines and the resulting visual impacts are difficult to mitigate, though a few specific design standards will be implemented to reduce visual impacts to the extent practicable. Turbines and towers will be painted a uniform matte white or off-white as recommended by the FAA; the use of a matte finish would inhibit reflections or glare. No signs, writing, or advertising will be permitted on the turbines. The turbines will not be lighted with the exception of the synchronized red flashing lights to satisfy FAA marking and lighting requirements. Where lighting may be necessary elsewhere on the proposed Project, such as at the substation or O&M facility, lights will be shielded and directed downward and inward toward the facilities to prevent offsite glare.

A viewshed analysis will be conducted to identify whether nighttime views would potentially be affected from the turbines equipped with red flashing aviation lights. Therefore, this potential impact will be fully analyzed in the EIR. A Visual Resources Technical Report, to be incorporated into the EIR, will be prepared in Spring 2018.

2.2 AGRICULTURE AND FORESTRY RESOURCES

AGRICULTURE AND FOREST RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☒	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☒	☐	☐	☐
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☒	☐	☐	☐

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Finding: No Impact

The majority of the Project area is considered Other Land by the Farmland Mapping and Monitoring Program (FMMP). A portion of the Project area near SR 299 East is designated by the FMMP as Grazing Land. The Project site does not contain land currently designated as prime, unique, or important farmland by the FMMP. Therefore, the proposed Project would not convert prime farmland, unique farmland, or farmland of statewide importance to nonagricultural use and there would be no impact which means that this impact will not be evaluated in the EIR.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Finding: No Impact

Construction of an electric generating facility is allowed in the TP district with the issuance of a Use Permit. Based on the review of a 2006/2007 Shasta County Williamson Act map (California Department of Conservation 2017), the Project area is not currently under a Williamson Act Contract nor is it zoned for agricultural use by Shasta County. Consequently, the Project would not conflict with existing zoning for agricultural use or a Williamson Act Contract. Therefore, there would be no impact from the proposed Project and the impact will not be evaluated in the EIR.

c)Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

Finding: Less Than Significant Impact

Portions of the Project area are zoned for timberland production (TP). According to the Shasta County Zoning Ordinance, permitted uses for the TP zoning district generally consist of forest management practices including uses compatible with the growing and harvesting of timber. Construction of an electric generating facility is a conditionally-permitted use. The proposed Project would result in the permanent conversion of 972 acres of timberland to non-timber land use, if approved through the use permit process. Therefore, the proposed Project would not conflict with existing zoning or cause rezoning and would have a less that significant impact on timberlands zoned as Timber Production. As such, this impact will not be analyzed further in the EIR.

d)Result in the loss of forest land or conversion of forest land to non-forest use?

Finding: Potentially Significant Impact

The proposed Project would result in permanent conversion of 972 acres of timberland to non-timberland use in the area where there is a permanent Project disturbance (i.e. the turbine pads, new access roads, O&M facility, and substation). The total leased area for the proposed Project is approximately 37,436 acres. All areas within the Project area boundary beyond the proposed Project's permanent disturbance or maintained vegetation would remain in timber production, and the proposed Project would coordinate with the landowner, Shasta Cascades Timberlands, LLC, to restore temporarily disturbed areas (approximately 2,167 acres) to timber harvesting use after proposed Project construction is complete. The precise location of turbines is not presently known. Upon determination of turbine sites, any trees requiring removal, or any tree(s) scheduled to be harvested during the construction period, would be harvested prior to initiation of construction activities in that location. Construction or operation of the proposed Project is not

anticipated to affect timber harvesting activities outside of the temporary or permanent disturbance areas.

Due to the permanent loss of timberland to non-timberland use, this potential impact warrants further evaluation and will be analyzed in the EIR.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

Finding: Potentially Significant Impact

The proposed Project would result in permanent conversion of 972 acres of timberland to non-timberland use in the area where there is a permanent Project disturbance (i.e. the turbine pads, new access roads, O&M facility, and substation). The total leased area for the proposed Project is approximately 37,436 acres. All areas within the Project area boundary beyond the proposed Project's permanent disturbance or maintained vegetation would remain in timber production, and the Project would coordinate with the landowner, Shasta Cascades Timberlands, LLC, to restore temporarily disturbed areas (approximately 2,167 acres) to timber harvesting use after proposed Project construction is complete. The precise location of turbines is not presently known. Upon determination of turbine sites, any trees requiring removal, or any tree(s) scheduled to be harvested during the construction period, would be harvested prior to initiation of construction activities in that location. Construction or operation of the proposed Project is not anticipated to affect timber harvesting activities outside of the temporary or permanent disturbance areas.

The proposed Project area is partially zoned as a TP district in Chapter 17.08 of the Shasta County Zoning Ordinance. Uses permitted within the TP zoning district generally consist of forest management including the growing and harvesting of timber and uses compatible with the growing and harvesting of timber. Construction of an electric generating facility is allowed in the TP district with the issuance of a Use Permit. However, because this impact involves changes in the existing environment which could result in conversion of forest land to non-forest use, further evaluation will be required. Therefore, this impact will be analyzed in the EIR.

2.3 AIR QUALITY

AIR QUALITY **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☒	☐	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☒	☐	☐	☐

a) Conflict with or obstruct implementation of the applicable air quality plan?

Finding: Potentially Significant Impact

The proposed Project would not be anticipated to conflict with or obstruct implementation of the Northern Sacramento Valley Planning Area 2015 Triennial Air Quality Attainment Plan as adopted by Shasta County, or any other applicable air quality plan. However, proposed Project emissions will need to be modeled to determine if the proposed Project would conflict with an existing air quality plan. Although there is the potential to conflict with the existing plan, previous preliminary evaluation for the Project indicates that any conflict is likely insignificant, however, the need for emissions modeling warrants further evaluation. Therefore, discussion of potential impacts the proposed Project would have on air quality plans will be evaluated in the EIR.

***b)** Violate any air quality standard or contribute substantially to an existing or projected air quality violation? **c)** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)? **d)** Expose sensitive receptors to substantial pollutant concentrations? e)Create objectionable odors affecting a substantial number of people?*

Finding: Potentially Significant Impacts

Construction of the proposed Project would result in the emission of some pollutants as well as the generation of fugitive dust. Heavy equipment (such as trucks, cranes, and earthmovers) would be required in order to construct the proposed Project. The internal combustion of fuels to power this equipment would generate green-house gases and air pollutants. In addition, soil disrupting activities associated with construction of the proposed Project may result in the

generation of fugitive dust. Air pollutant emissions and fugitive dust levels would be highest near the proposed Project's construction sites (where the majority of activities would occur); however, lower levels of emissions and fugitive dust would also occur along travel routes to and from the Project area. Operation of the proposed Project has the potential to impact air quality as some emissions would be produced via the internal combustion of fuels for vehicles used by the Project's employees as well as some heavy equipment, such as cranes that may be required periodically for maintenance or repair of the proposed Project.

Construction and operation of the proposed Project would have a minor effect to air quality because proposed Project related emissions and increased fugitive dust levels would be temporary in nature, would occur at relatively low levels compared to the State and Federal ambient air quality standards, and BMPs would be implemented to minimize the effects of these emissions. The Applicant would implement standard BMPs in order to avoid or minimize impacts to air quality. These include measures to limit fugitive dust generation, limit the risk of wildfires, and requirements to keep all equipment in proper working order.

Preliminary review merits further evaluation and possible mitigation. Therefore, these potential impacts will be fully analyzed and evaluated in the EIR.

2.4 BIOLOGICAL RESOURCES

BIOLOGICAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐

BIOLOGICAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? **b)** Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Finding: Potentially Significant Impacts

Construction of the proposed Project would result in temporary and permanent ground clearing and vegetation removal for installation of proposed Project facilities. Temporary disturbances would occur during construction of the underground and overhead electrical collection system, as well as in temporarily cleared areas around turbine pads, and construction staging and equipment laydown areas. Permanent ground disturbance includes a subset of the construction related disturbance where permanent facilities will be located including the O&M facility and associated parking and storage area, the substation and switching station, the permanently cleared areas around each turbine pad, met towers, and the permanent access roads.

Due to these temporary and permanent disturbances, the proposed Project may have direct or indirect (through habitat modifications) effects on candidate, sensitive, or special status species or on riparian habitat or other sensitive natural community identified in local of regional plans, policies, and regulations or by the California Department of Fish and Wildlife or USFWS. Wind energy projects pose particular potential risk to birds and bats and guidelines for reducing such impacts have been developed (California Energy Commission and California Department of Fish and Game, October 2007). A Site Characterization Study (SCS) will be conducted to assess the presence of habitat for species of concern at the landscape level, assess the potential for

presence of plant and wildlife species of concern on the proposed Project, assess the potential occurrence of areas that may be precluded from development, assess the potential presence of plant communities on the proposed Project that may provide habitat for wildlife species of concern, and assess the potential areas of wildlife concentrations within the proposed Project.

Based on information gathered during the SCS, and through consultation with the landowner biologist and agency representatives, sensitive species surveys for both wildlife and plants may be conducted if sensitive species (or their habitat) is identified within the proposed Project area. A Habitat Restoration Plan and a Vegetation Management Plan will be developed for the Project. Additionally, an Invasive Species Management Plan, as warranted, will be developed for implementation during construction of the proposed Project.

Preliminary review merits further evaluation. Therefore, these potential impacts will be fully analyzed and evaluated in the EIR. Additional studies related to biological resources that are either underway or which are anticipated to be available in time for incorporation into the EIR are: Biological Survey Report, Eagle Use Survey Report, Nest Survey Memo, and Bat Desktop Assessment Report. See Section 3.0 for anticipated timing of these studies.

On March 2, 2018, CDFW provided a response to Shasta County's Informal Consultation Request for the Use Permit for the proposed Project. Comments and recommendations in the letter refer to the forthcoming Project EIR and the studies and data that will inform analysis of baseline conditions and potential impacts. Specific reference was made to the Biological Resources Work Plan, which was developed to identify baseline biological studies to be conducted for the development of the Project, as well as additional special-status species and habitat surveys. Additional comments and recommendations, in general, referred to: additional special-status species and habitat surveys; evaluation of potential impacts to CESA-listed species (or plants or animals listed as endangered or threatened under CESA); avian surveys; rare plant and sensitive natural communities; and additional monitoring and studies related to wildlife and aquatic resources, among other issues. CDFW also requested review of biological studies conducted prior to release of the draft EIR for the Project. The letter is included among those received and attached in Appendix C. A formal response regarding the implications of CDFW's comments and recommendations for the Biological Resources Work Plan and the Project EIR will be prepared and provided to Shasta County.

c)*Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption or other means?*

Finding: Potentially Significant Impact

The Federal Water Pollution and Control Act was initially established by the U.S. Congress in 1948 and revised significantly in 1972 when it became known commonly as the Clean Water Act (CWA). This act is intended to protect the quality of waters in the U.S., including the physical, chemical, and biological properties of these waters (CWA 1972). Waters protected under the

CWA are not limited simply by navigability, as upstream waters, headwaters, and connected wetlands are known to impact the integrity of downstream navigable waters. The CWA thus plays an important role in controlling pollutants or sediments that may enter watersheds through varying means. The CWA is administered by the Environmental Protection Agency and the United States Army Corps of Engineers (USACE).

Due to the temporary and permanent disturbances described above, the proposed Project may have adverse effect on federally protected wetlands as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means. The Applicant will conduct a desktop assessment of the waters, including wetlands, at the proposed Project, in order to inform preliminary design of the Project as well as a future field delineation of jurisdictional waters. The Applicant will communicate with the USACE, if necessary, in an effort to determine the potential occurrence of jurisdictional waters at the proposed Project and will also consult available public information sources such as the National Wetlands Inventory (NWI), which is operated by the USFWS. Additional resources may include examination of aerial imagery or U.S. Geological Survey (USGS) topographic maps. Therefore, discussion of potential impacts the proposed Project would have on federally protected wetlands will be evaluated in the EIR. A Wetlands and Waters Memorandum is anticipated to be completed in the second quarter of 2018.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? **e)** Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Finding: Potentially Significant Impacts

Due to the temporary and permanent disturbances described above, the proposed Project may have adverse effect on wildlife species, migratory wildlife corridors, and other biological resources. The SCS will assess the presence of habitat for species of concern at the landscape level, assess the potential for presence of plant and wildlife species of concern on the proposed Project, assess the potential occurrence of areas that may be precluded from development, assess the potential presence of plant communities on the proposed Project that may provide habitat for wildlife species of concern, and assess the potential areas of wildlife concentrations within the Project.

In addition to the SCS, a number of baseline wildlife studies are planned in accordance with the USFWS Land-Based Wind Energy Guidelines (WEG; USFWS 2012) Tier 3 – Field Studies, to document wildlife and habitat in the Project area and to predict Project impacts. Therefore, a discussion of these potential impacts will be evaluated further in the EIR.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?

Finding: No Impact

There are no currently adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans for the Project area or its vicinity. The proposed Project would not conflict with any habitat conservation plan. Therefore, no impact would occur, and this impact will not be analyzed further in the EIR.

2.5 CULTURAL RESOURCES

CULTURAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐

a) *Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?* ***b)*** *Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?*

Finding: Potentially Significant Impacts

A Cultural Resources Report will be prepared by Stantec Environmental, LLC, consistent with Section 106 of the 1966 National Historic Preservation Act and Section 15064.5 of California Code of Regulations related to the California Environmental Quality Act (CEQA) and Historic Resources, regarding the identification and protection of historic resources and unique archaeological resources (per CEQA's definition). This report is anticipated to be completed during the spring of 2018. The Applicant's cultural resource consultant will conduct a review of existing information, will coordinate with Native Americans (see Section 2.17), and will conduct field surveys of the Project site in accordance with state and county regulations. If any cultural resources are found, they will be evaluated for significance (per CEQA definition) and any effects on these resources by Project facilities or activities will also be evaluated. If historic resources or unique archaeological resources are identified in the Project site and evaluated as

potentially being impacted by the Project, the Applicant will develop and implement measures to mitigate the effects of the Project on these resources. Therefore, these potential impacts will be further analyzed in the EIR.

c)Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

Finding: Potentially Significant Impact

Records searches and map research will be conducted by the Applicant's cultural resources consultant to determine the likelihood of the Project site containing paleontological resources, in accordance with the 2010 Paleontological Resources Preservation Act. Results of these investigations, including an evaluation of effect on any identified paleontological resources, shall be included in the Cultural Resources Report. Therefore, this potential impact will be further analyzed in the EIR.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Finding: Potentially Significant Impact

The Applicant's cultural resource consultant will confirm the presence or lack of presence of known human remains within the Project site. As part of the preparation of the Cultural Resource Report, coordination with Native Americans will be conducted. If human remains are discovered during the review of existing information, coordination with Native Americans, or through field surveys of the Project site, the proposed Project design will avoid these remains to the extent practicable. If human remains are discovered during ground-disturbing activities, the Applicant's construction contractors will be required to stop work until the Shasta County coroner has been informed and determines that no investigation of the cause of death is required; and if the remains are of Native American origin, protocols under California Public Resource Code Section 5097.98 are followed. By following this "stop-work" protocol, impacts to human remains would be minimized. Potential impacts that could occur as a result of the proposed Project will therefore be further analyzed in the EIR.

2.6 GEOLOGY AND SOILS

GEOLOGY AND SOILS **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				

GEOLOGY AND SOILS **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☒	☐	☐	☐
ii) Strong seismic ground shaking?	☒	☐	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
iv) Landslides?	☒	☐	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☒	☐	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☒	☐	☐	☐

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

ii. Strong seismic ground shaking?

iii. Seismic-related ground failure, including liquefaction?

iv. Landslides?

Finding: Potentially Significant Impact

As discussed in the attached geotechnical report (Appendix A) the proposed Project area does not have any active faults (See Figure 10 of the geotechnical report) and the overall hazard potential related to earthquake seismicity would be considered relatively low. However, the potential for seismic related ground failure, including liquefaction, to occur will need to be further evaluated due to the slight-to-high or slight-to-moderate erosion potential of the surrounding soils in the Project area. The steep slopes in the Project area combined with the characteristics of the underlying soils could result in unstable foundations for the turbines and thus, result in a hazard. Additionally, landslides are apparent in this area, which can be seen in Figure 12 of the geotechnical report. The steep slopes in the Project area will require further evaluation and a final geotechnical investigation to determine the best sites for optimum turbine stability. Therefore, this would be considered a potential impact and will be further analyzed in the EIR.

b) Result in substantial soil erosion or the loss of topsoil?

Finding: Potentially Significant Impact

Soil types are mapped in Figure 6 of the desktop geotechnical report (Appendix A). Soils identified within the proposed Project area have slight to high or slight to moderate erosion hazard. A grading permit will be required prior to any grading activities. The grading permit includes requirements for erosion and sediment control, including retention of topsoil. However, given the amount of grading typically required for wind energy projects, there would still be potential for significant impacts related to erosion and sediment control. Therefore, this impact would be considered a potential impact and will be further analyzed in the EIR.

c)Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Finding: Potentially Significant Impact

The proposed Project is located within a seismically active region, although the area of the site is relatively low hazard (Shasta County and City of Anderson 2017). As noted in the attached desktop geotechnical report (Appendix A), seismicity in the Project area is relatively low intensity and is not a controlling factor for turbine foundation design and therefore should not expose the proposed Project's structures to risk of loss due to seismic ground shaking or liquefaction.

The Project area does have some steep slopes exceeding 25% and the likelihood of slope failure/landslides is high in specific portions of the Project area. Further evaluation of slope

stability will need to be conducted and each turbine site will need to be evaluated for stability before finalizing the location of turbines. Therefore, this potential impact will be further analyzed in the EIR.

d)Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Finding: Potentially Significant Impact

A desktop geotechnical analysis was completed in January 2017 indicating that a preliminary field investigation may not be warranted (Appendix A). A final geotechnical investigation will need to be performed prior to final design and construction. Therefore, this potential impact warrants further evaluation and will be analyzed in the EIR.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Finding: Potentially Significant Impact

Prior to obtaining a Shasta County septic permit, further geotechnical investigations will need to be conducted to identify whether the soils are suitable for adequately supporting a septic system. Therefore, this potential impact will be analyzed further in the EIR.

2.7 GREENHOUSE GAS EMISSIONS

GREENHOUSE GAS EMISSIONS **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Finding: Potentially Significant Impact

Impacts associated with greenhouse gas emissions are more appropriately evaluated on a regional level than at a project scale as greenhouse gas impacts on the atmosphere are

generally independent of the point of emission. The internal combustion of fuels to power heavy equipment for construction as well as vehicles trips associated with the proposed Project construction and operation will generate greenhouse gases. However, construction and operation-related emissions would occur at a low enough level that they are expected to have a negligible effect to climate change.

Proposed Project emissions will need to be modeled to determine if the proposed project would generate greenhouse gas emissions, either directly or indirectly that might have a significant impact on the environment. Although there is the potential for greenhouse gas emissions, preliminary evaluation for the project indicates that any conflict is likely insignificant. However, the need for emissions modeling warrants further evaluation. Therefore, the impact potential Impact will be analyzed further in the EIR.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Finding: Potentially Significant Impact

Proposed Project emissions will need to be modeled to determine if the proposed Project would conflict with an existing plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Although there is the potential to conflict with the existing plan, preliminary evaluation for the project indicates that any conflict is likely insignificant, however, the need for emissions modeling warrants further evaluation. Therefore, this potential impact will be analyzed further in the EIR.

2.8 HAZARDS AND HAZARDOUS MATERIALS

HAZARDS AND HAZARDOUS MATERIALS **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

HAZARDS AND HAZARDOUS MATERIALS **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☒	☐	☐	☐

a) *Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?* ***b)*** *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

Finding: Potentially Significant Impacts

Construction of the proposed Project involves the routine transport, use, storage, and disposal of hazardous materials. Construction requires the operation of heavy equipment and construction vehicles. Hazardous materials required for construction equipment include antifreeze, diesel fuel, gasoline, hydraulic oil, lube oil, and grease. It would not be practical to remove construction equipment from the wind farm site for refueling and general maintenance such as changing fluids and lubricating parts; therefore, these activities will take place onsite. Other hazardous or regulated materials that will be used during construction include paints, adhesives, curing

compounds, concrete, bentonite, and fertilizer. Construction equipment used to mix and pour concrete will be washed onsite because it would not be practical to remove this equipment from the site for washing. There will be waste disposal and collection receptacles and sanitary facilities on site during construction.

In accordance with the California Health and Safety Code and California Code of Regulations the Applicant will prepare a Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan (HMBP) that details proper procedures for storing and using hazardous materials and storing and disposing of hazardous waste. The plan will contain sufficient detail to address the purpose of the plan and to readily translate into the actions necessary to comply with relevant regulations. The plan will include information about site activities, site contacts, worker training procedures, and a hazardous materials inventory in accordance with Article 80 of the Uniform Fire Code. Regulatory requirements and standard industry BMPs for managing the routine transport, use, storage, and disposal of hazardous materials, petroleum products, and solid waste will be implemented, and implementation of these measures would ensure impacts are minor.

The amounts of hazardous materials required during O&M will be less than the amounts needed for construction and storage will be limited to designated areas on the wind farm site. The HMBP will be updated with information about hazardous materials pertaining to the O&M phase, BMPs for managing hazardous materials will be implemented, and appropriate control measures such as secondary containment to contain leaks and spills will be provided.

Hazardous materials will be stored in the O&M facility and storage sheds and used at each turbine. Specific hazardous materials inventories, including quantities, will be documented in the HMBP and updated annually or as required by regulation. Nonhazardous batteries will be stored at the substation. Inspections of each of these facilities for leaks and spills will be done at least monthly. Implementing these measures would ensure that impacts would be minor.

All fuels, waste oils, and solvents will be collected and stored in tanks or drums within a secondary containment area consisting of an impervious floor and bermed sidewalls capable of holding the volume of the largest container stored within. The Applicant will ensure that all equipment operating in or near a drainage, or in a basin, is in good working condition, and free of leaks. All vehicles will have drip pans during storage to contain minor spills and drips. No refueling or storage will take place within 100 feet of a drainage channel or structure. Spill containment materials will be on site or readily available for any equipment maintenance or refueling that occurs adjacent to a drainage. In addition, all maintenance crews working with heavy equipment will be trained in spill containment and response. Additionally, although not a hazardous material, towers will be set back 100 feet from non-participating properties.

Therefore, due to the use of hazardous materials during construction and operations, these potential impacts warrant further evaluation and will be analyzed in the EIR.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?

Finding: No Impact

The Project area is not within 0.25 miles of an existing or proposed school. The closest school, Montgomery Creek Elementary School, is 1.5 miles away from the Project boundary. Therefore, no impact would occur, and this impact will not be analyzed further in the EIR.

d)Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Finding: Potentially Significant Impact

Construction of the proposed Project on sites listed as hazardous by government agencies could expose employees and the public to hazardous materials. The Applicant will prepare a Phase I Environmental Site Assessment of the Project site (Phase I ESA) in accordance with either ASTM E1527-13 or E2247-08. The Phase I ESA will identify if the Project site includes any hazardous materials sites as identified by California Department of Toxic Substances Control.

The Project site is undeveloped and much of it is located at higher elevation than surrounding land. This decreases the possibility of migration of toxic substances from surrounding land onto the Project site. However, naturally occurring hazardous materials such as asbestos could be encountered during construction. If hazardous materials are present onsite, the development and implementation of a HMBP would mitigate any impacts. Therefore, this potential impact will be further analyzed in the EIR.

e) *For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area?* ***f)*** *For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?*

Finding: No Impacts

There are three publicly operated airports in Shasta County: Fall River Mills Airport, Redding Municipal Airport, and Benton Field. The Project area is more than approximately 20 miles from the closest airport (Fall River Mills Airport). The Project area is not within an airport protection area which includes the lands laying within the approach zones, transitional zones, and conical zones as they apply to a particular airport. Therefore, no impact would occur, and this issue will not be considered in the EIR.

g) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?

Finding: Less than Significant Impact

There is no currently adopted emergency response plan for the Project area, and the proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan for a neighboring populated area (e.g., Burney, Moose Camp, and Montgomery Creek). Further, construction and operation of the Project would not be in conflict with the goals, objectives, or action items listed in the Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan (Shasta County and City of Anderson 2017), specifically those related to reducing the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and County-owned facilities (Goal 5) from flood, wildfire, earthquake, hazardous materials, or volcano.

Therefore, this would be considered a less than significant impact and will not be analyzed further in the EIR.

h) Would the Project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Finding: Potentially Significant Impact

The Project area is located in a "Very High Fire Hazard Severity Zone" according to Figure FS-1 in the Shasta County General Plan (Shasta County 2004). In August 1992, the Fountain Fire burned 64,000 acres, including portions of the Project area. Much of the Project area has been replanted; however, vegetation is still recovering.

The proposed Project could increase the potential for wildfires associated with the use of vehicles and electrical equipment and increased human presence during construction of the Project. Sparks from vehicles and construction equipment, heated mufflers, spark producing construction activities such as welding, and improper disposal of matches or cigarettes, for example, could start a fire. There will also be increased presence and use of petroleum products, including oils and lubricants onsite, thereby increasing the potential for fires.

The proposed Project will develop and implement a Fire Prevention Plan (FPP) prior to construction and operation. With implementation of the FPP, the impacts to the proposed Project related to wildfires during the O&M phase are anticipated to be very low. The risk of fire will be further minimized by the design features of the turbines. Fire prevention features will be incorporated within the turbines.

The FPP will include emergency response and evacuation procedures that will include immediate notification of local fire agencies. Staff will be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire.

These measures may include, but are not limited to equipping earthmoving and portable equipment with internal combustion engines with spark arrestors, requiring vehicles to carry fire suppression equipment when onsite such as fire extinguishers, flappers, and shovels, and storing fire suppression tools at designated locations within the wind farm. Fuel breaks will also be maintained around the proposed Project facilities including the turbines, substation, and O&M facility in accordance with the Fire Plan (per Public Resource Code 4290).

Due to the high fire severity rating and the potential for the proposed Project to increase the fire risk, this potential impact will be further analyzed in the EIR.

2.9 HYDROLOGY AND WATER QUALITY

HYDROLOGY AND WATER QUALITY **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☒	☐	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☒	☐	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐

HYDROLOGY AND WATER QUALITY **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
f) Otherwise substantially degrade water quality?	☒	☐	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☒	☐

a) *Violate any water quality standards or waste discharge requirements?* ***f)*** *Otherwise substantially degrade water quality?*

Finding: Potentially Significant Impacts

Due to the temporary and permanent disturbances, the proposed Project may have potential for increased erosion and sedimentation from ground disturbing activities primarily associated with construction. Prior to construction, a NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit), will be obtained from the Central Valley Water Board. Coverage under a General Construction Permit requires the preparation of a SWPPP and Notice of Intent (NOI). The SWPPP will include pollution prevention measures (erosion and sediment control measures and measures to control non-storm water discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, a detailed construction timeline, and a BMP monitoring and maintenance schedule. The NOI will include site-specific information and the certification of compliance with the terms of the General Construction Permit. Potential impacts will be analyzed further in the EIR.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Finding: Less Than Significant Impact

Impermeable surfaces created by the proposed Project will be limited to the concrete tower foundations, substation, and O&M facilities. Access roads, laydown areas, and staging areas will be gravel and therefore permeable. The introduction of a limited extent of impermeable surface associated with the proposed Project would not significantly alter the groundwater recharge or available groundwater supplies.

Water for the operations and maintenance facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Any efforts to install a domestic well will be conducted in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. The Applicant anticipates that less than 5,000 gallons of water will be used per day for operations and maintenance. Construction of a domestic well and groundwater use for operation will only occur if the Applicant determines groundwater is available in the Project area and sufficient to support the proposed Project's uses. It is unlikely the proposed Project will substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Therefore, this would be considered a less than significant impact and will not be analyzed further in the EIR.

c)*Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?* ***d)*** *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?* ***e)****Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*

Finding: Potentially Significant Impacts

To the extent practicable, the proposed Project will maintain the local surface drainage patterns. New access roads will be located to follow natural contours and minimize side hill cuts to the extent possible and will include other BMPs such as ditches and culverts to capture and convey storm water runoff. Prior to obtaining a grading permit for the Project, the construction contractor will confirm storm water runoff requirements and, if necessary, incorporate storm water control measures such as seepage pits, drywells, and/or detention basins.

Impermeable surfaces created by the proposed Project will be limited to the concrete tower foundations, the substation, and O&M facilities. Access roads, laydown areas, and staging areas will be gravel and therefore permeable. Permanent storm water control structures will be installed to prevent erosion where access roads, buildings, storage areas, and parking areas are constructed. Upon completion of construction, all disturbed areas where permanent gravel or aggregate is not required will be revegetated. Erosion control measures included in the Temporary Erosion and Sediment Control (TESC) Plan will also prevent water quality degradation from storm water runoff during the operational phase of the proposed Project.

Due to the potential impacts from the proposed Project related to erosion, drainage, and runoff, as well as possible mitigation needed, impacts will be analyzed further in the EIR.

g) *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?* ***h)*** *Place within a 100-year flood hazard area structures which would impede or redirect flood flows?*

Finding: No Impacts

The proposed Project does not include placing housing within 100-year flood hazard area. The Project area is in an area of minimal flood hazards (Zone X). However, the Project area is generally located along mountain ridges and above the floodplain. Therefore, no impact would occur and this impact will not be analyzed further in the EIR.

i)Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Finding: No Impact

The proposed Project will not be located within an area susceptible to flooding as a result of the failure of a levee or dam. Therefore, no impact would occur, and this impact will not be analyzed further in the EIR.

j) Inundation by seiche, tsunami, or mudflow

Finding: Less Than Significant Impact

Lakes near the Project area are lower in elevation than the Project area and therefore do not pose a significant threat of a seiche. The proposed Project will be inland and not at risk of a tsunami. A large portion of the Project area experienced a forest fire in 1992 and may consequently be at greater risk of significant erosion and mudflows than the area was before the fire. Because the proposed Project would not significantly increase runoff from the Project site or significantly alter existing drainage patterns, operation of the Project would not contribute to the risk of mudflows in the Project area. Although construction activities for the proposed Project would involve grading activities that could potentially increase erosion in the area and the potential for mudflows, compliance with CWA requirements and provisions of the County

Grading Ordinance will ensure that this impact is less than significant. Therefore, this would be considered a less than significant impact and will not be analyzed further in the EIR.

2.10 LAND USE AND PLANNING

LAND USE AND PLANNING Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

a) Would the Project physically divide an established community?

Finding: No Impact

Burney is the largest established community near the Project area, located approximately 6 miles east of the Project area. The community of Moose Camp is located closer to the Project area (within 1/5 mile of the closest turbine); however, the proposed Project facilities would not create any access issues to or from this community and would not physically divide it. Therefore, no impact would occur, and this impact will not be further analyzed in the EIR.

b) Would the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Finding: Less Than Significant Impact

The lands underlying the Project are within the TP and U zoning districts. SCC Section 17.08.030(D) pertains to the TP district and conditionally allows the construction of "gas, electrical, water, or communication transmission facility, or other public improvements, in accordance with Government Code Section 51152." Per SCC Section 17.64.040, wind energy systems are conditionally permitted in the U district as long as it is not otherwise prohibited by law and not

inconsistent with any portion of the General Plan. The Project, which will convert 972 acres of an approximately 37,436-acre project area from timberland to non-timberland use (see Section 2.2), is consistent with General Plan as the U district lands underlying the proposed Project are timberlands outside of the Timber Protection Zone and as such, power generation facilities are an allowed use per General Plan Policy 6.2.4, T-d.

Also, per SCC Section 17.88.035, a Use Permit is required in all districts for wind energy systems which do not meet the definition of "small wind energy system" (e.g. wind energy systems greater than 50 kilowatts in size). A Use Permit application has been prepared pursuant to SCC Section 17.92.020m, which are the rules governing Use Permits.

Because the General Plan designation and zoning district underlying the proposed Project conditionally allow electrical power facilities, the proposed Project would be considered consistent with the General Plan designation and zoning. Therefore, this would be considered a less than significant impact and will not be analyzed further in the EIR.

c)Would the Project conflict with any applicable habitat conservation plan or natural communities' conservation plan?

Finding: No Impact

There are no currently adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans for the proposed Project area or its vicinity. Therefore, the proposed Project would not conflict with any such plan and there would be no impact and no further analysis is warranted in the EIR.

2.11 MINERAL RESOURCES

MINERAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

a) Would the Project result in the loss of availability of a known mineral resource classified MRZ-2 by the State Geologist that would be of value to the region and the residents of the state?

Finding: No Impact

The proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. There are no known mineral resources of regional value located on or near the Project area. Therefore, no impacts would occur, and no further analysis is warranted in the EIR.

b) Would the Project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

Finding: No Impact

The proposed Project would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local General Plan, specific plan, or other land use plan. The Project area is not identified in the General Plan Minerals Element as containing a locally-important mineral resource. In addition, the Project area is not designated as a mineral resource zone by the Shasta County Zoning ordinance. Therefore, no impacts would occur, and no further analysis is warranted in the EIR.

2.12 NOISE

NOISE **Would the project result in:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐

NOISE **Would the project result in:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

a) *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies?* ***b)*** *Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?* ***c)****A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?* ***d)****A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?*

Finding: Potentially Significant Impacts

The noise level performance standards for new projects, per the Shasta County General Plan (Shasta County 2004) includes the following limits.

- 50 A-weighted decibels (dBA) at the property line of noise-sensitive uses between the nighttime hours of 10:00 p.m. and 7:00 a.m.
- 55 dBA at the property line of noise-sensitive uses between the evening hours of 7:00 p.m. and 10:00 p.m.

The construction of the proposed Project may cause short-term but unavoidable noise impacts depending on the construction activity being performed and the distance to receiver. Noise will also be emitted by turbines during operation. Noise-sensitive land uses in the vicinity of the Project area comprise residences on Haines Road west of Burney and residences and campsites in the Moose Camp area.

The Applicant will prepare a Noise Technical Report to evaluate construction and operational noise associated with the proposed Project and consistent with Shasta County standards. This report will need to establish a baseline noise level for the Project site, predict Project-based noise

levels at adjacent property lines, assess potential impacts, and outline mitigation scenarios that could be implemented to reduce potential impacts. To characterize the existing noise environment, long-term, 24-hour, unattended noise level measurements will be made at up to 5 locations continuously over a 5-day period. Monitoring equipment will be located at sensitive receptors – which could include occupied buildings, parks, and adjacent property lines – in order to accurately assess the site's existing short-term and long-term noise levels.

Sound levels from the operation of the turbines will be predicted for the nearest property boundary for daytime and nighttime conditions using the "Cadna/A" software program developed by DataKustik, GmbH (Munich). This modeling tool allows the site terrain to be accurately recreated in three dimensions and wind/atmospheric effects on sound propagation to be evaluated as needed. Results will be shown in detailed sound level contour maps and tables will be developed that include the noise level predicted at the property line of the nearby noise receptor locations.

The collected baseline ambient sound level data and the turbine sound level contribution predicted by modeling will need to be used to determine whether there is potential for exposure of persons to noise level in excess of Shasta County noise standards as well as exposure of persons to excessive ground borne vibration or noise levels. The technical report is anticipated to be completed in the spring of 2018.

Therefore, because further analysis will be required, these would be considered potential impacts and will be evaluated in the EIR.

> ***e)*** *For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?* ***f)*** *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?*
>
> **Finding: No Impacts**

The proposed Project is not located within an airport land use plan, within two miles of a public airport, or in the vicinity of a private airstrip. Therefore, there would be no impact and no further analysis is warranted in the EIR.

2.13 POPULATION AND HOUSING

POPULATION AND HOUSING **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?

Finding: No Impact

The proposed Project does not propose any new homes or new public roads and population growth will not occur as a result of the Project. The temporary workforce required for construction is anticipated to consist partially of local labor, with temporary arrangements (hotels within 1 hour of the Project, RV parks, shared rentals, etc.) accommodating workers from outside of the region. As such, no impact would occur, and no further analysis is warranted in the EIR.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Finding: No Impact

The proposed Project will not displace existing housing because the proposed Project will be constructed on private timber lands used for timber production. No impact would result from Project development and no further analysis is warranted in the EIR.

c)Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Finding: No Impact

The proposed Project will not displace people because the proposed Project will be constructed on private timber lands used for timber production. No impact would result from Project development and no further analysis warranted in the EIR.

2.14 PUBLIC SERVICES

PUBLIC SERVICES **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☒	☐	☐	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

a) Fire protection?

Finding: Potentially Significant Impact

The proposed Project area is located in a "Very High Fire Hazard Severity Zone" according to Figure FS-1 in the Shasta County General Plan (Shasta County 2004). The Project could increase the potential for wildfires associated with the use of vehicles and electrical equipment and increased human presence during construction of the proposed Project. Sparks from vehicles and construction equipment, heated mufflers, spark producing construction activities such as welding, and improper disposal of matches or cigarettes, for example, could start a fire. There will also be increased presence and use of petroleum products, including oils and lubricants onsite, thereby increasing the potential for fires.

The proposed Project will develop and implement an FPP prior to construction and operation. The FPP will include emergency response and evacuation procedures that will include

immediate notification of local fire agencies. Staff will be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire. These measures may include, but are not limited to equipping earthmoving and portable equipment with internal combustion engines with spark arrestors, requiring vehicles to carry fire suppression equipment when onsite such as fire extinguishers, flappers, and shovels, and storing fire suppression tools at designated locations within the wind farm. Fire breaks will also be maintained around the proposed Project facilities including the turbines, substation, and O&M facility (per Public Resource Code 4290). With implementation of the FPP, the impacts to the proposed Project related to wildfires during the O&M phase are anticipated to be very low. The risk of fire is further minimized by the design features of the turbines as fire prevention features will be incorporated within the turbines. Additionally, access roads will serve as fire breaks and will provide access for fire suppression activities.

However, due to the high fire risk and the potential for the proposed Project to impact fire risk in the Project area, this potential impact warrants further evaluation and will be discussed further in the EIR.

b) Police protection?

Finding: Less Than Significant Impact

The proposed Project will be located on private timber lands owned by Shasta Cascades Timberlands, LLC and the turbine sites will be accessed existing via private logging roads and proposed access roads accessed via the private logging roads. Public access to the turbine sites will be restricted to avoid potential safety hazards per the proposed Project's approved Access Control Plan. All turbine towers will be locked as well as the O&M facility. The substation will be fenced and locked to prevent unauthorized entry. These precautionary measures will minimize the need for police surveillance and response. During construction, when opportunity for theft is high, security will be on site at all times when active construction is not occurring. Therefore, a less-than-significant impact would occur, and while no further analysis is warranted in the EIR, it will document communication with the Shasta County Sherriff's Office confirming its ability to provide service to the Project.

***c)** Schools? **d)** Parks? **e)** Other public facilities?*

Finding: No Impacts

Population growth will not occur as a result of the proposed Project and demands on local parks districts and school districts are therefore not expected to change in direct correlation to the proposed Project. As such, there would be no impacts related to schools, parks, or other public facilities resulting from implementation of the proposed Project and no further analysis is warranted in the EIR.

2.15 RECREATION

RECREATION Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Finding: No Impact

Population growth will not occur as a result of the proposed Project therefore use of existing local or regional parks or other recreational facilities are not expected to change or increase. No further analysis is warranted in the EIR.

b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Finding: No Impact

The proposed Project does not propose any new or expanded recreational facilities. In addition, the Project area is not located on public land or otherwise designated as open space or recreational land, nor does it have formal public access for recreation. Therefore, no impacts would occur, and no further analysis is warranted in the EIR.

2.16 TRANSPORTATION AND TRAFFIC

TRANSPORTATION/TRAFFIC **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☒	☐	☐	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☒	☐	☐	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☒	☐
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
e) Result in inadequate emergency access?	☒	☐	☐	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

a) *Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?* ***b)*** *Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?*

Finding: Potentially Significant Impacts

Temporary increases in traffic due to proposed Project construction have the potential to degrade the level of service (LOS) on public roadways in the proposed Project's transportation and traffic study area. A Traffic Assessment Report is anticipated to be completed in Spring 2018. The traffic impact analysis will examine existing traffic volumes and LOS on roadways and increases in congestion at intersections within the proposed Project study area. Therefore, these potential impacts will be analyzed further in the EIR.

c)Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Finding: Less Than Significant Impact

There are three publicly operated airports in Shasta County: Fall River Mills Airport, Redding Municipal Airport, and Benton Field. The Project area is more than 20 miles from the closest airport. The Project area will not be located an airport protection area. The proposed Project will not result in changes to air traffic patterns. An FAA determination of no hazard will be requested, and the notice of proposed construction submitted to the FAA will trigger a Department of Defense screening for military flight path conflict, including training routes. Therefore, a less-than-significant impact would occur. While no further analysis is warranted, the EIR will summarize the FAA determination.

d)Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Finding: Potentially Significant Impact

Safety hazards may increase due to construction-generated traffic such as trucks entering and existing SR 299. Potential for increases in safety hazards from construction traffic will need to be examined in the Traffic Assessment Report. In addition, any safety hazards that result from construction related traffic can be mitigated through the development and implementation of a Traffic Control Plan in accordance with County and Caltrans policies. Therefore, this potential impact warrants further analysis and will be evaluated in the EIR.

e) Result in inadequate emergency access?

Finding: Potentially Significant Impact

Emergency access to the Project area could be affected by proposed Project construction—specifically, road closures, detours, and construction-related traffic could delay or obstruct the movement of emergency vehicles. This impact is considered potentially significant, but implementation of a Traffic Control Plan will reduce this impact. The construction of new access roads will also provide more access for emergency vehicles to access the Project site. Therefore, this potential impact warrants further evaluation and will be discussed further in the EIR.

f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Finding: No Impact

The proposed Project will not result in any conflicts with adopted policies, plans, or programs supporting alternative transportation. Therefore, no impact would occur, and no further analysis is warranted in the EIR.

2.17 TRIBAL CULTURAL RESOURCES

V. TRIBAL RESOURCES **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size, or object with cultural value to the California Native American tribe and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).	☒	☐	☐	☐

V. TRIBAL RESOURCES **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
b) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size, or object with cultural value to the California Native American tribe and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐	☐	☐

(a) *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size, or object with cultural value to the California Native American tribe and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).* ***(b)*** *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size, or object with cultural value to the California Native American tribe and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.*

Finding: Potentially Significant Impacts

The identification of tribal cultural resources is a continuing process between the appropriate tribes or tribal representatives and the CEQA lead agency. The appropriate tribes or tribal representative are the authority on identifying tribal cultural resources. The archival records search performed as part of the cultural resources analysis resulted in the identification of known tribal cultural resources within or near the study area. Furthermore, initial field review of the Project area did not identify any signs of previously unidentified subsurface tribal cultural resources within or adjacent to the Project area. However, further coordination with Tribes during the CEQA process will be needed to identify highly sensitive areas and resources.

Pursuant to Assembly Bill 52, Shasta County is required to contact the Native American tribes that are culturally or traditionally affiliated with the geographic area in which a proposed project is located within 14 days of a public agency's decision to undertake a project (or a determination that the project application is complete). Notified tribes have 30 days to request consultation with the lead agency to discuss potential impacts on tribal cultural resources and measures for addressing those impacts. Shasta County sent a letter to the Pit River Tribe regarding the project on December 8, 2017. No formal consultation was requested; however, the Pit River Tribe has responded to Shasta County and requested additional environmental information related to the Project (see Appendix C).

The Applicant's cultural resource consultant will conduct a review of existing information, will coordinate with Native Americans, and will conduct field surveys of the Project site in accordance with state and county regulations. If any cultural resources are found, they would be evaluated for significance (per CEQA definition) and any effects on these resources by Project facilities or activities would also be evaluated. If historic resources or unique archaeological resources are identified in the Project site and evaluated as potentially being impacted by the Project, the Applicant will develop and implement measures to mitigate the effects of the Project on these resources. Therefore, these potential impacts will be further analyzed in the EIR.

2.18 UTILITIES AND SERVICES SYSTEMS

UTILITIES AND SERVICE SYSTEMS **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐

UTILITIES AND SERVICE SYSTEMS **Would the project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Finding: No Impact

Construction of the proposed Project will generate a minor amount of wastewater from portable toilets, which will be provided and serviced on a contracted basis. The construction contractor will dispose of sanitary wastewater pursuant to applicable regulations. Wastewater from the O&M building during operation of the proposed Project will be processed using an on-site septic system. This system will conform to all County design standards and specifications to avoid impacts on ground- or surface waters. Therefore, no impact would result from Project implementation and no further analysis is warranted in the EIR.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Finding: No Impact

Construction of the proposed Project will require water for dust control, equipment wash down, wetting of concrete, emergency fire suppression, and other activities. During construction, the contractor will arrange for delivery of water to the site by water trucks from a source with an existing water right. Water for the operations and maintenance facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Wastewater from the O&M facility will be processed using an on-site septic system. Because the proposed Project will not connect to any water or wastewater treatment facilities, there would be no impact on the capacity of an existing water

or wastewater treatment facilities and therefore, this impact will not be analyzed further in the EIR.

c)Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Finding: Less Than Significant Impact

Prior to obtaining a grading permit for the proposed Project, the construction contractor will confirm storm water runoff requirements and, if necessary, incorporate storm water control measures such as seepage pits, drywells, and/or detention basins. Permanent storm water control structures will be installed to prevent erosion where access roads, buildings, storage areas, and parking areas are constructed.

Impermeable surfaces created by the proposed Project will be limited to the concrete tower foundations, substation, and O&M facilities. Access roads, laydown areas, and staging areas will be gravel and therefore permeable. The proposed Project would not be anticipated to significantly increase the amount of storm water runoff and would not alter existing drainage patterns. Therefore, environmental impacts from construction of new storm water drainage facilities would be less than significant and will not be analyzed further in the EIR.

d)Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Finding: Less Than Significant Impact

Construction of the entire Project will require water for dust control, equipment wash down, batching concrete, emergency fire suppression, and other activities. During construction, water will either be provided from an onsite water well or the contractor will arrange for delivery of water to the site by water trucks from a source with an existing water right.

Water for the operations and maintenance facility may be supplied by the installation of a domestic well, or by a water storage tank installed at the building with water periodically transported to the tank. Any efforts to install a domestic well will be conducted in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. The Applicant anticipates that less than 5,000 gallons of water will be used per day for operations and maintenance. Construction of a domestic well and groundwater use for operation will only occur if the Applicant determines groundwater is available in the Project area and sufficient to support the proposed Project's uses. It is unlikely the proposed Project will substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

The proposed Project will not require the acquisition or expansion of entitlements and there will be no need to develop infrastructure to connect to an existing water supply distribution facility.

Therefore, the proposed Project would have a less than significant impact and will not be analyzed further in the EIR.

e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?

Finding: No Impact

Wastewater from the O&M facility will be processed using an on-site septic system. Because the proposed Project will not connect to any wastewater treatment facilities, there will be no impact on the capacity of an existing wastewater treatment facility and therefore, this impact will not be analyzed further in the EIR.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Finding: Less Than Significant Impact

Construction debris (e.g. scrap lumber and metal) and operational debris (e.g. office waste and some paper waste) will be collected by either the construction contractor or Burney Disposal Inc. and disposed of at the Burney Transfer Station and ultimately the Anderson Landfill or recycled with applicable and feasible. A low volume of waste associated with the proposed Project will be anticipated and there will be no need to increase the Anderson Landfill capacity. Therefore, there would be a less than significant impact to landfills and no further analysis is warranted in the EIR.

g) Comply with federal, state and local statutes and regulations related to solid waste?

Finding: No Impact

The proposed Project will comply with Federal, State, and local statues and regulations related to solid waste. Construction debris (e.g. scrap lumber and metal) and operational debris (e.g. office waste and some paper waste) will be collected by either the construction contractor or Burney Disposal Inc. and disposed of at the Burney Transfer Station and ultimately the Anderson Landfill or recycled with applicable and feasible. A low volume of waste associated with the proposed Project will be anticipated and there will be no need to increase the Anderson Landfill capacity. Therefore, there would be no impact and no further analysis is warranted in the EIR.

2.19 MANDATORY FINDINGS OF SIGNIFICANCE

MANDATORY FINDINGS OF SIGNIFICANCE:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Finding: Potentially Significant Impact

The proposed Project will consist of up to 100 wind turbines and associated infrastructure, located on 94 assessor parcels. In addition to the wind turbines and associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components. These activities will require temporary and permanent clearing of ground cover and vegetation, including grading, and therefore have potential to degrade the quality of the environment and affect habitat. Such effects will be evaluated in the EIR.

b) Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Finding: Potentially Significant Impact

The proposed Project will be located in the immediate vicinity of the Hatchet Ridge Wind Project. Cumulative effects related to the existing wind project, as well as to other currently proposed actions in the Project vicinity, will be fully evaluated in the EIR.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Finding: No Impact

The proposed Project will be constructed on private timber lands used for timber production. No displacement of residents will result from development of the Project. As such, no direct or indirect substantial adverse effects on human beings would result from Project development and no further analysis is warranted in the EIR.

3.0 DESCRIPTION OF TECHNICAL STUDIES/SURVEYS TO BE CONDUCTED

PWD, with support from its environmental consultants, will develop the following to support the Project's environmental review.

3.1 TRAFFIC ASSESSMENT REPORT

A Traffic Assessment Report will be prepared using traffic and transportation evaluation methodology consistent with the Shasta County Circulation Element of the General Plan, as well as Caltrans guidelines. Existing traffic and transportation conditions of the Project area, including the traffic volumes along SR 299 East will be examined. This includes a review of current daily, peak hour and truck traffic volumes to the east and west of the access roads along SR 299. PWD will assess the operation and performance of the existing roadways using the procedures from the Highway Capacity Manual (HCM2010 or HCM 6, as required). This analysis will provide LOS based on vehicular delay and calculate percent time-spent-following slower vehicles. Other existing conditions that will be analyzed include roadway hazards, non-motorized transportation, transit service, rail service and air traffic operations.

Construction trip generation and distribution will be based on the workforce projected for the site and their respective locations of residence or lodging. Construction delivery routes will also

be assessed. Likewise, trip generation and distribution will be evaluated during normal operation once the construction phase is complete and the wind project is placed online.

For construction and operations-related traffic, PWD will detail impacts and propose mitigation measures, including:

- Increases in traffic volumes and degradation in levels of service;
- Increases in safety hazards;
- Interference with emergency access and circulation; and,
- Inadequate parking supply to meet the parking demand.

A construction traffic control plan will be developed and implemented to deal with these issues.

3.2 VIEWSHED ANALYSIS, VISUAL SIMULATIONS, AND ASSESSMENT OF POTENTIAL EFFECTS TO VISUAL RESOURCES

A viewshed analysis will be completed to identify locations within the analysis area from which the Project would potentially be visible. The viewshed analysis for the Project will use the preliminary Project layout and a U.S. Geological Survey digital elevation model dataset. The analysis results will identify all points on the terrain surface with a direct line of sight to the tip elevation of one or more Project turbines. Because the turbines are the tallest structures of the proposed Project and are typically sited along ridges to maximize the wind resource, the turbines are generally the most prominent Project facilities and the most likely to be visible. However, it should be noted that the viewshed analysis results will be a conservative representation of potential Project visibility. The analysis represents line-of-sight conditions based only on topography; it does not account for factors that might obscure or block visibility from a specific location or at certain times, such as weather conditions, existing structures, or vegetation.

The viewshed analysis will, along with desktop review of aerial photographs, land use and resource plans, land use data, and the public scoping comments for the Project, serve as a basis for identification of preliminary viewpoints for eventual use in the production of visual simulations. Preliminary viewpoints will be field verified to ensure site visibility and representation with regard to sensitive viewers in the project vicinity, which include residents, recreationists using trails and other facilities within the project viewshed, and roadway travelers. Analysis of simulated views from up to seven viewpoints in the evaluation of potential effects to visual resources is anticipated. Such viewpoints typically afford direct line-of-site to proposed project facilities and as such are often in locations where views are no more than partially obstructed by topography or intervening vegetation.

3.3 BIOLOGICAL SURVEYS

The principal objectives of biological resource studies are to: 1) conduct a review of existing data on biological resources present or that may occur at the Project in order to provide a

preliminary evaluation of the site; 2) evaluate avian use of the Project area including small birds, large birds, and eagles specifically; 3) locate and describe raptor nests in the Project and surrounding area that may be subject to disturbance and/or displacement effects from facility construction and/or operation; 4) estimate seasonal bat use of the Project area; 5) examine potential occurrence of California sensitive species within the Project area; and 6) produce a desktop assessment of wetlands and waters within the Project area. Additional information regarding species that are present or may occur in the vicinity of the Project will be gathered through appropriate agency correspondence and from reports developed for other local or regional projects. This information will be used in final impact analyses where applicable. An initial meeting to discuss biological resource studies with the USFWS, CA Department of Fish and Wildlife, Shasta County, and the Applicant occurred in June 2017.

3.3.1 Site Characterization Study

Recommendations in the WEG (USFWS 2012) call for tiered wind energy project development that includes: Tier 1 – Preliminary Site Evaluation, Tier 2 – Site Characterization, and Tier 3 – Field Studies to Document Site Wildlife and Habitat and Predict Project Impacts. Part of addressing Tiers 1 and 2 includes analysis of existing data sources to determine potential species occurrence at a project. These species may include both wildlife and plants. Special focus is given to species which are state or federally listed as threatened or endangered, or to species that are otherwise considered sensitive by regulatory agencies or non-governmental organizations. Additional site characterization work under the WEG includes identifying and evaluating habitat within project boundaries such as land cover types. The SCS will include a preliminary evaluation of the Project site area that addresses the following key objectives:

- Presence of habitat for species of concern at the landscape level;
- Potential for presence of plant and wildlife species of concern on the Project;
- Potential occurrence of areas that may be precluded from development;
- Potential presence of plant communities on the Project that may provide habitat for wildlife species of concern; and
- Potential areas of wildlife concentration within the Project.

The SCS report will be based primarily on a desktop evaluation of the Project area using accessible resources including both publicly available data (e.g., California Native Plant Society data, California Natural Diversity Database [CNDDB] data), as well as privately held data that may be available from past surveys conducted by the landowner and/or lessee. The Applicant's survey contractor will conduct a reconnaissance-level site visit to evaluate current site conditions at the Project relative to that derived from desktop review. Any state or federally listed, or sensitive plants or wildlife observed during the site visit will be documented and locations will be recorded for later inclusion in the SCS report.

3.3.2 Baseline Wildlife Studies

Baseline wildlife studies at the Project will address use by eagles (bald eagles [*Haliaeetus leucocephalus*] and golden eagles [*Aquila chrysaetos*]), non-eagle raptors (e.g., *Buteo* hawks) and other large birds (e.g., waterfowl), small birds (e.g., passerines) and bats. This work will rely on data gathered during surveys at the Project. However, an initial desktop assessment of bat species that have the potential to occur at the Project area will also be conducted and will help inform follow-up field studies. Following this initial assessment, bat use of the Project will be evaluated through acoustic surveys in 2017. Finally, should the need arise based on information gathered during the initial site visit, and through consultation with the landowner biologist and agency representatives, sensitive species surveys for both wildlife and plants may be conducted.

A draft Biological Survey Report will be completed within two months of survey effort completion. However, a preliminary results memo can be provided to Shasta County by the end of 2017. The draft Biological Survey Report will include a discussion of the methods, results, and potential Project impacts based on the results of avian point-count surveys, raptor nest surveys, and bat acoustic surveys.

3.3.2.1 Sensitive Species Surveys

Sensitive Species Surveys may be conducted to examine occurrence of California sensitive plant and animal species within the Project area, pending consultation with agency representatives and landowner biologists. Should sensitive species surveys be deemed necessary, data collected from these efforts will be included in the Biological Survey Report. In addition, if sensitive species surveys are conducted, a Sensitive Species Memo will be prepared after completion of surveys and will be provided to Shasta County within one month.

3.3.2.2 Eagle Use Surveys

Eagle use (including Bald eagles [*Haliaeetus leucocephalus*] and golden eagles [*Aquila chrysaetos*]) in the study area will be determined through direct observation. Following guidelines in the USFWS Eagle Conservation Plan Guidance (ECPG; USFWS 2013, USFWS 2016), as well as recommendations in the WEG, the Applicant's biological survey contractor will initiate a two-year study of eagle use in the Project beginning in April 2017. Surveys will be conducted weekly at half the survey stations, such that each station is surveyed twice per month.

3.3.2.3 Baseline Avian Point-Count Surveys

In addition to the eagle use surveys described above, surveys aimed at evaluating small bird use of the Project area will also be conducted. The ECPG recommends conducting studies of this sort separately from eagle or large bird use surveys to increase detection probability. Assessment of small bird use of the Project area is important as it may allow identification of any previously unknown occurrence of sensitive species, identification of high use periods (e.g., migration

windows, breeding seasons), or areas within the larger Project area that may be particularly important to small birds (e.g., reproductive habitats, stopover sites).

Avian point-count surveys will occur from approximately mid-April through June during the spring, and from September through November during the fall. Two years of surveys, conducted during vernal and autumnal migration windows, will begin in April 2017. Completion of this effort will result in data for inclusion in a draft Biological Survey Report.

3.3.2.4 Raptor Nest Surveys

The tiered development approach defined in the WEG includes numerous recommendations for Tier 3 studies, as mentioned previously. The WEG and ECPG not only recommend utilizing surveys for eagles and raptors, as outlined in the previous section, but also suggests that project developers engage in raptor nest surveys if there is potential for the Project to impact breeding raptors, which is the case throughout western North America (USFWS 2012, 2013). The Applicant's survey contractor will conduct aerial raptor nest surveys within and in areas surrounding the Project for two breeding seasons (2017 and 2018). Breeding season varies by species and geographic location, but generally includes February through July in northern California. In addition to the Project area, a 2-mile buffer surrounding the Project will be surveyed for raptor nests, and a 10-mile buffer will be surveyed for eagle nests.

A draft Nest Survey Memo will be provided to Shasta County after completion of the final nest survey each year. Data from the raptor nest surveys will also be included in the aforementioned Biological Survey Report.

3.3.2.5 Bat Desktop Assessment

An assessment of bat use, or potential use, of the Project area will be conducted through a desktop analysis of existing resources to determine the possible species of bat which may occur within the Project area. This desktop assessment will draw upon publicly available resources such as the CNDDB, and Bat Conservation International Species Profiles, which are sortable by state and include known range information. Additional consultation with the landowner biologist or agency representatives may be used to inform this assessment, where applicable. This effort will include a description of habitats for particular bat species at the Project and will result in the production of a list of species that may occur at the Project and the possible timing of occurrence for these species. Because many bat species are migratory, it is possible that some species may only be present during brief migratory windows, or may use habitat within the Project area as maternity sites or hibernacula. Particular focus will be given to the potential for occurrence of state or federally listed, candidate, or sensitive species.

The result of this desktop assessment will be a draft Bat Desktop Assessment Report.

3.3.2.6 Bat Acoustic Surveys

As part of Tier 3 baseline biological studies, passive bat acoustic monitoring will be conducted. The WEG suggest utilizing passive acoustic monitoring to assess bat use as it is a practical method of determining whether or not threatened, endangered or otherwise sensitive species are utilizing a Project area (USFWS 2012). Bat acoustic monitoring devices will be deployed at the Project area. Data from these surveys will be included in the Biological Survey Report. This report will include a description of the methods, results, and a discussion of potential Project impacts on bats determined to be using the Project area. In addition, data on detector locations will included in the Biological Survey Report.

3.3.2.7 Nocturnal Bird Migration Surveys

A review was conducted of local, regional, and nation-wide radar studies at sites proposed for wind energy development, including the adjacent Hatchet Ridge wind energy facility (Tetra Tech 2013). Results indicated that the majority of spring and fall nocturnal migrants fly at heights well above the rotor swept zone of commercial wind turbines. Additionally, radar has not been demonstrated to be a reliable predictor of collision risk at proposed wind energy sites. Based on an analysis of 15 seasonal nocturnal migration studies conducted at wind energy sites between 1999 and 2009, no correlation was found between pre-construction passage rates and flight heights, and post-construction fatality estimates (Tidhar et al. 2010a). Because radar has been demonstrated to provide limited data relating to risk assessments and operational results from the adjacent operating wind project indicating limited impacts to nocturnal migrants, a nocturnal avian migration survey will not be conducted at the Project.

3.3.3 Project Area Desktop Assessment of Wetlands and Waters

Waters protected under the CWA are considered jurisdictional, and must be defined through a formal delineation process. The Applicant's survey contractor will conduct a desktop assessment of the waters, including wetlands, at the Project, in order to inform a future field delineation of jurisdictional waters. The Applicant's survey contractor will communicate with the USACE, if necessary, in an effort to determine the potential occurrence of jurisdictional waters at the Project and will also consult available public information sources such as the NWI, which is operated by the USFWS. Additional resources may include examination of aerial imagery or USGS topographic maps.

The desktop assessment will result in a Wetlands and Waters Memo. GIS files developed for the Wetlands and Waters memo will also be provided.

3.3.4 Additional Studies

The following studies are also being considered and will be prepared by the Applicant as warranted by environmental review and/or agency coordination:

- Noise Technical Report. Evaluation of potential construction noise associated with the Project consistent with Shasta County standards, if warranted by environmental review. No noise monitoring during construction is anticipated. If blasting is required during construction, noise monitoring protocols will be established and implemented.

- Phase 1 Cultural Resources Report. Will be prepared in a manner consistent with Section 106 of the 1966 National Historic Preservation Act regarding the identification and protection of significant cultural resources, as well as state and county guidelines, and will include relevant information from consultation with Native American tribes.

- Economic Impact Analysis. Conducted in accordance with Shasta County standards.

3.3.5 Anticipated Timing of Studies

Table 3-1 lists the studies described above and provides estimated timing for the completion of each.

Table 3-1. Summary of Studies and Estimated Timing

Study		Prepared by (if known)	Estimated Timing
Traffic Assessment Report		Stantec	Spring 2018
Visual Resources Technical Report		Stantec	Spring 2018
Biological Surveys and Related Studies			
	Site Characterization Study	West	Fall 2017 (Draft)
	Biological Survey Report	West	Preliminary Results – 1Q 2017 Draft – 3Q 2018
	Eagle Use Survey Report	West	Draft – 4Q 2018
	Nest Survey Memo	West	Results provided – 4Q 2017 and 3Q 2018
	Bat Desktop Assessment Report	West	Draft – Spring 2018
Wetlands and Waters Memorandum		Stantec	2Q 2018
Noise Technical Report		Stantec	Spring 2018
Phase 1 Cultural Resources Report		Stantec	Spring 2018
Economic Impact Analysis		Stantec	Spring 2018

4.0 REFERENCES

APLIC (Avian Powerline Interaction Committee) 2012. Reducing Avian Collisions with Power Lines - The State of The Art in 2012. Edison Electrical Institute. http://www.eei.org/resourcesandmedia/products/Pages/ProductDetails.aspx?prod=F20558BF-A097-4289-A8BA-1674B6096523&type=P

California Department of Conservation. 2017. Shasta County Williamson Act FY 2006/2007. Sheet 2 of 2. ftp://ftp.consrv.ca.gov/pub/dlrp/wa/Shasta_e_06_07_WA.pdf

California Energy Commission and California Department of Fish and Game. 2007. California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development. Available online: http://www.energy.ca.gov/2007publications/CEC-700-2007-008/CEC-700-2007-008-CMF.PDF

Johnson, G. D., and S. E. Stephens. 2011. Wind Power and Bio Fuels: A Green Dilemma for Wildlife Conservation. Chapter 8. Pp. 131-155. In: D. E. Naugle, ed. Energy Development and Wildlife Conservation in Western North America. Island Press, Washington, D.C.

Shasta County. 2004. Shasta County General Plan as Amended Through September 2004. September. Available online: https://www.co.shasta.ca.us/index/drm_index/planning_index/plng_general_plan.aspx

Shasta County and City of Anderson. 2017. Multi-Jurisdictional Hazard Mitigation Plan. Available online: https://www.co.shasta.ca.us/docs/libraries/public-works-docs/hmp-documents/shasta-county-hazard-mitigation-plan-november-2017.pdf

Tetra Tech, Inc. 2013. Hatchet Ridge Wind Farm Post-Construction Mortality Monitoring Year Two Annual Report. Prepared for: Hatchet Ridge Wind, LLC, Portland, Oregon. Available online at: http://wintuaudubon.org/Documents/HatchetRidgeYear2FinalReport3-13.pdf

Tidhar, D., C. Nations, and D.P. Young. 2010. What Have We Learned from Pre-Construction Radar Studies? Presented at the National Wind Coordinating Collaborative (NWCC) Wildlife and Wind Research Meeting VIII, October 19-21, 2010, Lakewood, Colorado

USEPA (U.S. Environmental Protection Agency). 2013. Level III ecoregions of the continental United States. Corvallis, Oregon, U.S. EPA – National Health and Environmental Effects Research Laboratory. Available online at: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states

USFWS (U.S. Fish and Wildlife Service). 2012. Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. Available online: http://www.fws.gov/cno/pdf/Energy/2012_Wind_Energy_Guidelines_final.pdf

USFWS. 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. US Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013. Executive Summary and front matter + 103 pp.

USFWS. 2016. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests; Final Rule. 50 CFR 13 and 22. United States Fish and Wildlife Service, Department of the Interior. 81 Federal Register (Fr) 242: 91494-91554. December 16, 2016.

Woodbridge, B., and C. D. Hargis. 2006. Northern Goshawk Inventory and Monitoring Technical Guide. General Technical Report WO-71. U.S. Department of Agriculture (USDA), Forest Service, Washington, D.C. 80 pp. July 2006.

4.1 SOURCES OF DOCUMENTATION FOR INITIAL STUDY CHECKLIST

In addition to the above, the following are sources of documentation for Initial Study Checklists in Shasta County. All headings of this source document correspond to the headings of the initial study checklist. In addition to the resources listed below, initial study analysis may also be based on field observations by the staff person responsible for completing the initial study. Most resource materials are on file in the office of the Shasta County Department of Resource Management, Planning Division, 1855 Placer Street, Suite 103, Redding, CA 96001, Phone: (530) 225-5532.

4.1.1 GENERAL PLAN AND ZONING

1. Shasta County General Plan and land use designation maps.
2. Applicable community plans, airport plans and specific plans.
3. Shasta County Zoning Ordinance (Shasta County Code Title 17) and zone district maps.

4.1.2 ENVIRONMENTAL IMPACTS

4.1.2.1 AESTHETICS

1. Shasta County General Plan, Section 6.8 Scenic Highways, and Section 7.6 Design Review.
2. Zoning Standards per Shasta County Code, Title 17.

4.1.2.2 AGRICULTURAL AND FORESTRY RESOURCES

1. Shasta County General Plan, Section 6.1 Agricultural Lands.
2. Shasta County General Plan, Section 6.2 Timber Lands.

3. Soil Survey of Shasta County Area, California, published by U.S. Department of Agriculture, Soil Conservation Service and Forest Service, August 1974.

4.1.2.3 AIR QUALITY

1. Shasta County General Plan Section, 6.5 Air Quality.

2. Northern Sacramento Valley Air Basin, 2006 Air Quality Attainment Plan.

3. Records of, or consultation with, the Shasta County Department of Resource Management, Air Quality Management District.

4.1.2.4 BIOLOGICAL RESOURCES

1. Shasta County General Plan, Section 6.2 Timberlands, and Section 6.7 Fish and Wildlife Habitat.

2. Designated Endangered, Threatened, or Rare Plants and Candidates with Official Listing Dates, published by the California Department of Fish and Wildlife.

3. Natural Diversity Data Base Records of the California Department of Fish and Wildlife.

4. Federal Listing of Rare and Endangered Species.

5. Shasta County General Plan, Section 6.7 Fish and Wildlife Habitat.

6. State and Federal List of Endangered and Threatened Animals of California, published by the California Department of Fish and Wildlife.

7. Natural Diversity Data Base Records of the California Department of Fish and Wildlife.

4.1.2.5 CULTURAL RESOURCES

1. Shasta County General Plan, Section 6.10 Heritage Resources.

2. Records of, or consultation with, the following:

   a. The Northeast Information Center of the California Historical Resources Information System, Department of Anthropology, California State University, Chico.

   b. State Office of Historic Preservation.

   c. Local Native American representatives.

   d. Shasta Historical Society.

4.1.2.6 GEOLOGY AND SOILS

1. Shasta County General Plan, Section 5.1 Seismic and Geologic Hazards, Section 6.1 Agricultural Lands, and Section 6.3 Minerals.

2. County of Shasta, Erosion and Sediment Control Standards, Design Manual

3. Soil Survey of Shasta County Area, California, published by U.S. Department of Agriculture, Soil Conservation Service and Forest Service, August 1974.

4. Alquist - Priolo, Earthquake Fault Zoning Maps.

4.1.2.7 GREENHOUSE GAS EMISSIONS

1. Shasta Regional Climate Action Plan

2. California Air Pollution Control Officers Association (White Paper) CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act

4.1.2.8 HAZARDS AND HAZARDOUS MATERIALS

1. Shasta County General Plan, Section 5.4 Fire Safety and Sheriff Protection, and Section 5.6 Hazardous Materials.

2. County of Shasta Multi-Hazard Functional Plan

3. Records of, or consultation with, the following:

    a. Shasta County Department of Resource Management, Environmental Health Division.

    b. Shasta County Fire Prevention Officer.

    c. Shasta County Sheriff's Department, Office of Emergency Services.

    d. Shasta County Department of Public Works.

    e. California Environmental Protection Agency, California Regional Water Quality Control Board, Central Valley Region.

4.1.2.9 HYDROLOGY AND WATER QUALITY

1. Shasta County General Plan, Section 5.2 Flood Protection, Section 5.3 Dam Failure Inundation, and Section 6.6 Water Resources and Water Quality.

2. Flood Boundary and Floodway Maps and Flood Insurance Rate Maps for Shasta County prepared by the Federal Emergency Management Agency, as revised to date.

3. Records of, or consultation with, the Shasta County Department of Public Works acting as the Flood Control Agency and Community Water Systems manager.

4.1.2.10 LAND USE AND PLANNING

1. Shasta County General Plan land use designation maps and zone district maps.

2. Shasta County Assessor's Office land use data.

4.1.2.11 MINERAL RESOURCES

1. Shasta County General Plan Section 6.3 Minerals.

4.1.2.12 NOISE

1. Shasta County General Plan, Section 5.5 Noise and Technical Appendix B.

4.1.2.13 POPULATION AND HOUSING

1. Shasta County General Plan, Section 7.1 Community Organization and Development Patterns.

2. Census data from U.S. Department of Commerce, Bureau of the Census.

3. Census data from the California Department of Finance.

4. Shasta County General Plan, Section 7.3 Housing Element.

5. Shasta County Department of Housing and Community Action Programs.

4.1.2.14 PUBLIC SERVICES

1. Shasta County General Plan, Section 7.5 Public Facilities.

2. Records of, or consultation with, the following:

    a. Shasta County Fire Prevention Officer.

    b. Shasta County Sheriff's Department.

    c. Shasta County Office of Education.

    d. Shasta County Department of Public Works.

4.1.2.15 RECREATION

1. Shasta County General Plan, Section 6.9 Open Space and Recreation.

4.1.2.16 TRANSPORTATION/TRAFFIC

1. Shasta County General Plan, Section 7.4 Circulation.
2. Records of, or consultation with, the following:
    a. Shasta County Department of Public Works.
    b. Shasta County Regional Transportation Planning Agency.
    c. Shasta County Congestion Management Plan/Transit Development Plan.
3. Institute of Transportation Engineers, Trip Generation Rates.

4.1.2.17 TRIBAL CULTURAL RESOURCES

1. Tribal Consultation in accordance with Public Resources Code section 21080.3.1

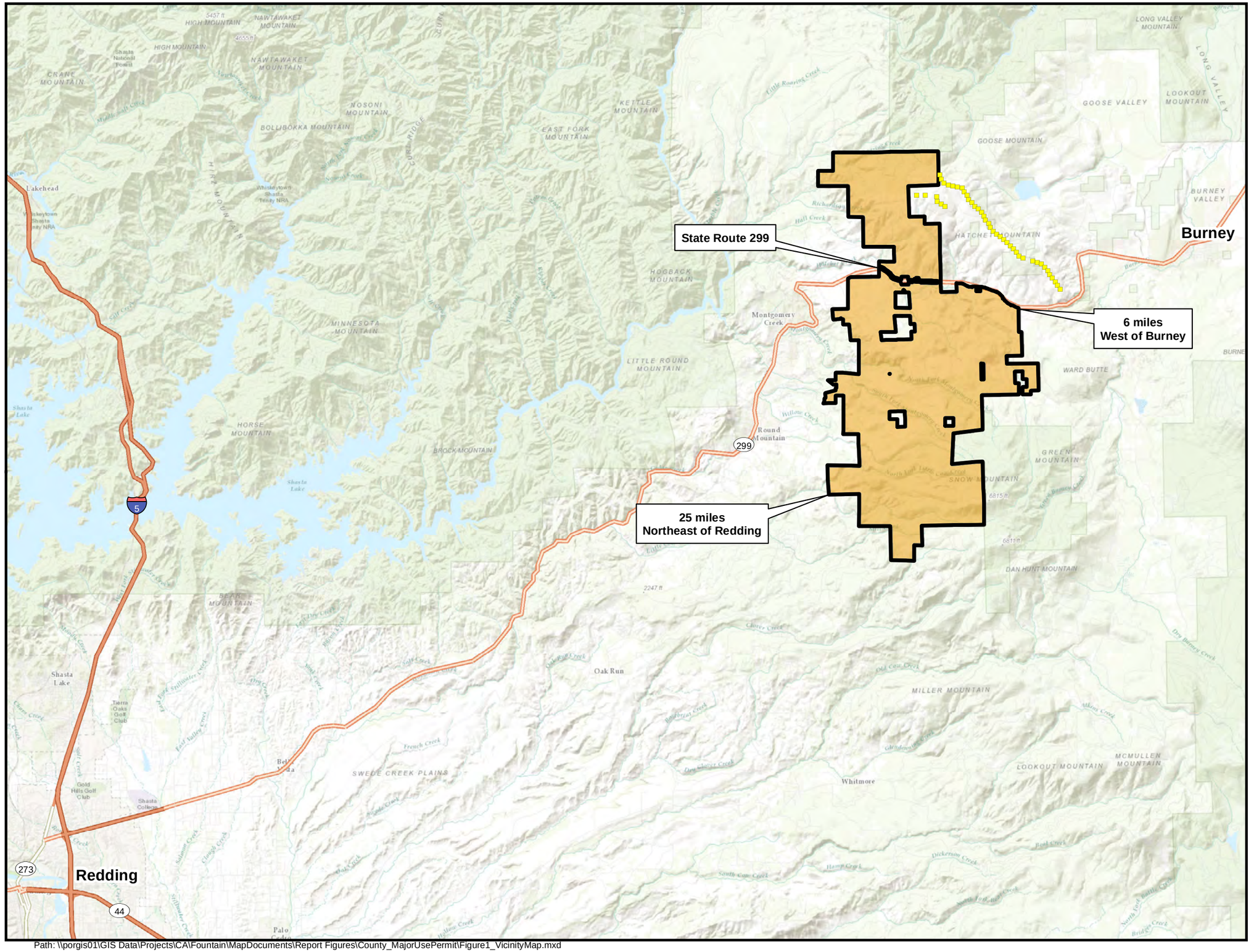
4.1.2.18 UTILITIES AND SERVICE SYSTEMS

1. Records of, or consultation with, the following:
    a. Pacific Gas and Electric Company.
    b. Pacific Power and Light Company.
    c. Pacific Bell Telephone Company.
    d. Citizens Utilities Company.
    e. T.C.I.
    f. Marks Cablevision.
    g. Shasta County Department of Resource Management, Environmental Health Division.
    h. Shasta County Department of Public Works.

5.0 FIGURES

Figure 1
Vicinity Map

Fountain Wind Project



Legend

- Existing Hatchet Ridge Wind Farm Turbine
- Project Boundary

N
W E
S

0 3 6
Miles

AVANGRID RENEWABLES

Path: \\porgis01\GIS Data\Projects\CA\Fountain\MapDocuments\Report Figures\County_MajorUsePermit\Figure1_VicinityMap.mxd

Modified Date: 10/18/2017

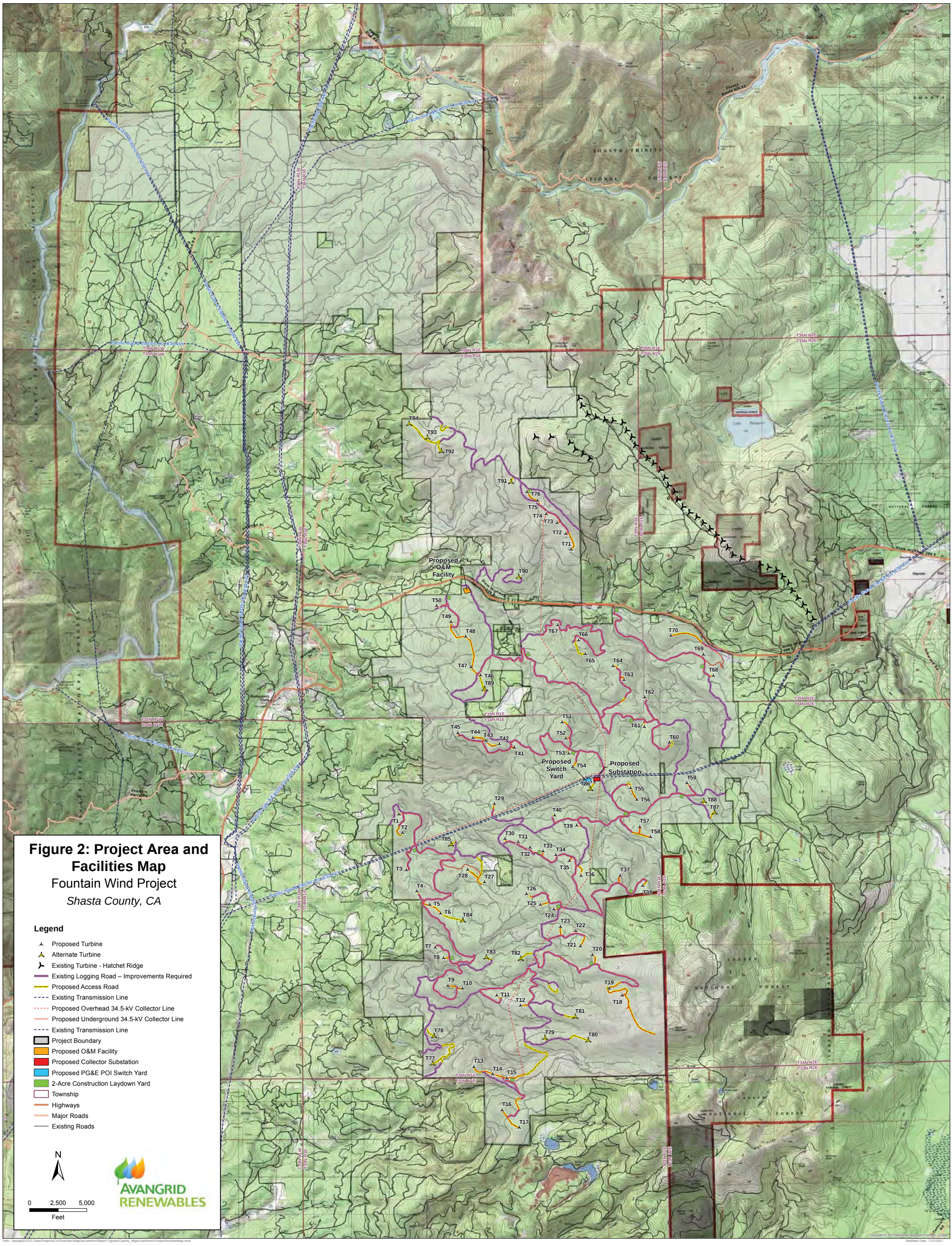


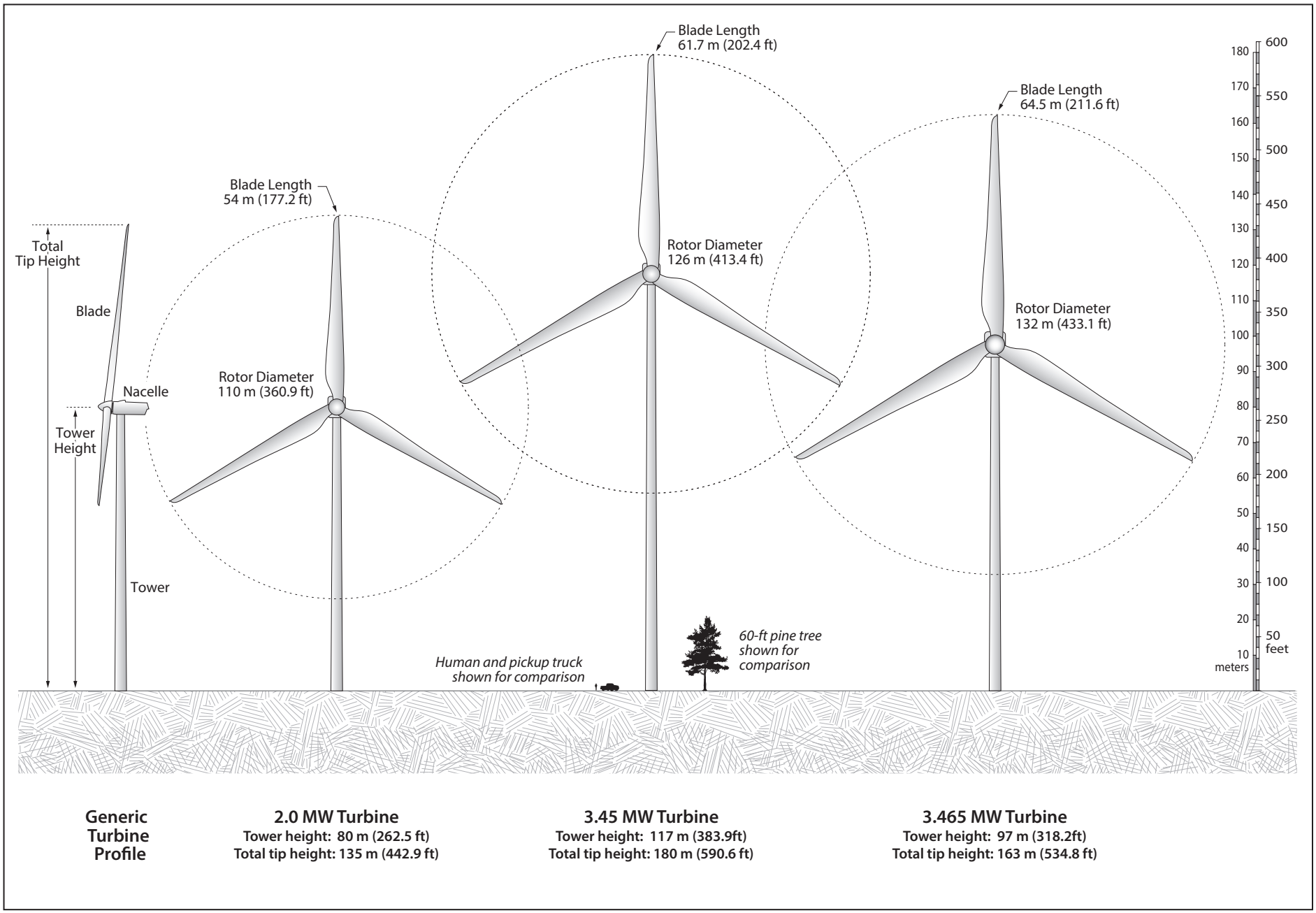
Figure 2: Project Area and Facilities Map

Fountain Wind Project

Shasta County, CA

Path: \\porgs01\GIS Data\Projects\CA\Fountain\MapDocuments\Report Figures\County_MajorUsePermit\ProjectFacilitiesMap.mxd

Modified Date: 7/12/2017



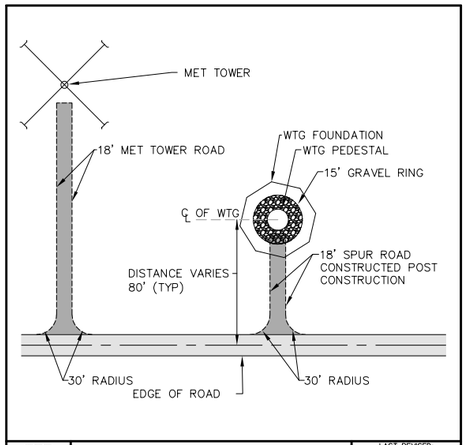
Generic Turbine Profile

2.0 MW Turbine
Tower height: 80 m (262.5 ft)
Total tip height: 135 m (442.9 ft)

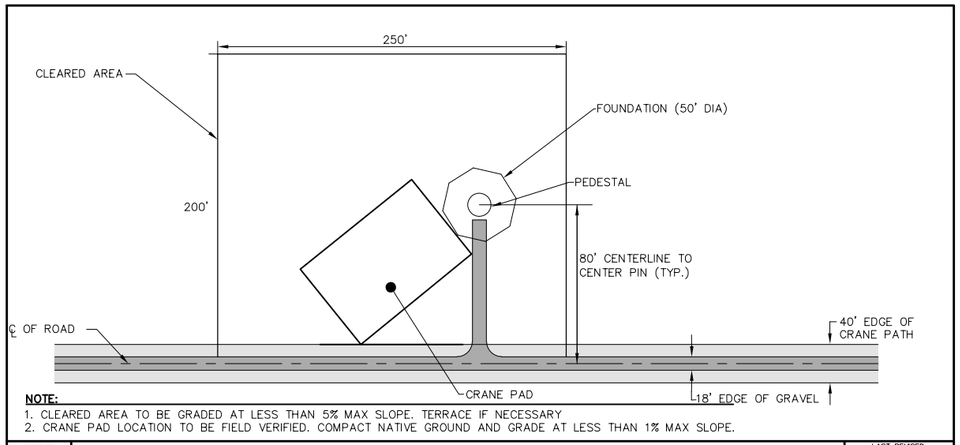
3.45 MW Turbine
Tower height: 117 m (383.9ft)
Total tip height: 180 m (590.6 ft)

3.465 MW Turbine
Tower height: 97 m (318.2ft)
Total tip height: 163 m (534.8 ft)

Figure 3: Typical Wind Turbine Profile

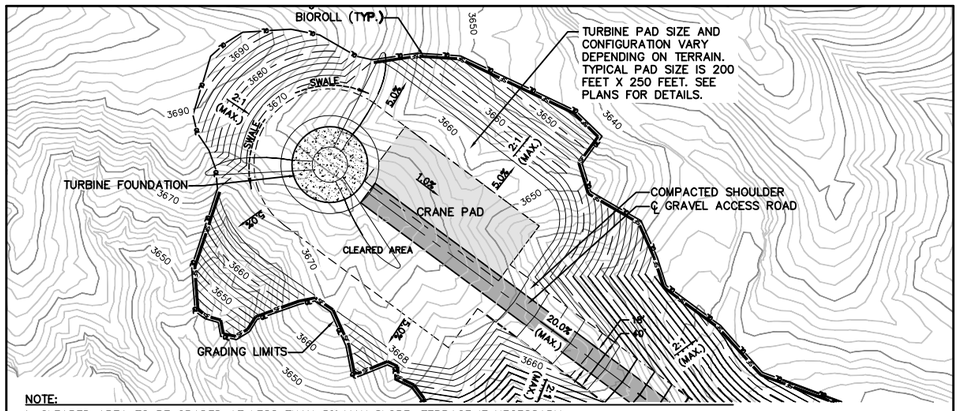


PERMANENT SPUR AND MET TOWER ROAD (TYPICAL) | LAST REVISED: 1/11/16 | TS02



NOTE:
1. CLEARED AREA TO BE GRADED AT LESS THAN 5% MAX SLOPE. TERRACE IF NECESSARY
2. CRANE PAD LOCATION TO BE FIELD VERIFIED. COMPACT NATIVE GROUND AND GRADE AT LESS THAN 1% MAX SLOPE.

TYPICAL FLATLAND WTG SITE – PLAN VIEW | LAST REVISED: 05/07/13 | TS04-A



NOTE:
1. CLEARED AREA TO BE GRADED AT LESS THAN 5% MAX SLOPE. TERRACE IF NECESSARY
2. CRANE PAD LOCATION TO BE FIELD VERIFIED. COMPACT NATIVE GROUND AND GRADE AT LESS THAN 1% MAX SLOPE.

TYPICAL HILLTOP WTG GRADING PLAN – PLAN VIEW | LAST REVISED: 05/07/13 | TS04-B

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Fountain Wind Project

Shasta County, California

Turbine Site Details

Figure 4: Typical Turbine Site

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Date: 6/19/17
Sheet: 1 OF 1

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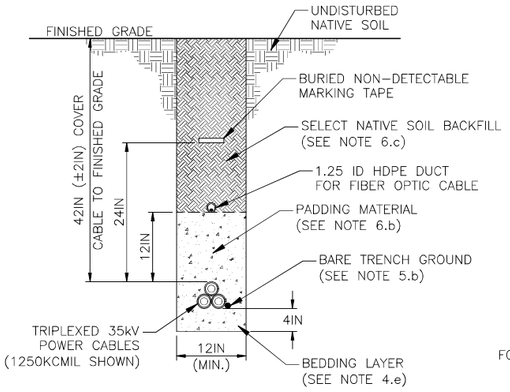
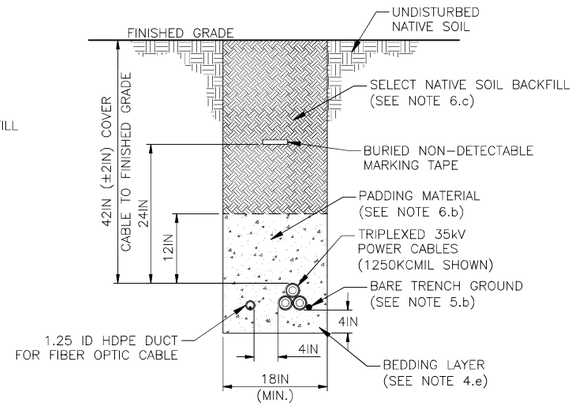


A PRIMARY POWER & COMMUNICATIONS CABLE DITCH
Not to Scale



B ALTERNATE POWER & COMMUNICATIONS CABLE DITCH
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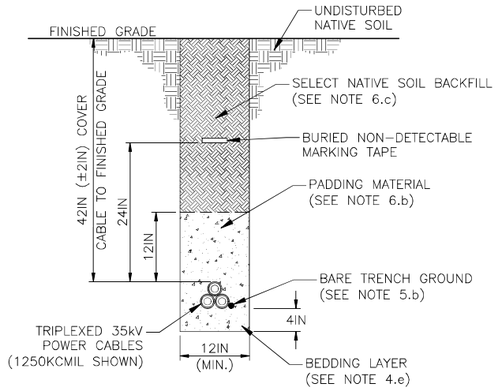

C 3-PHASE POWER ONLY CABLE DITCH
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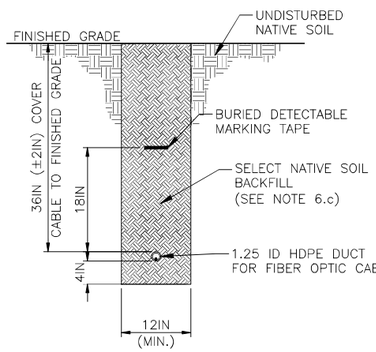

D FIBER ONLY DITCH
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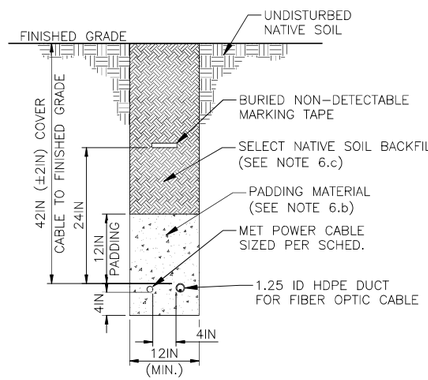
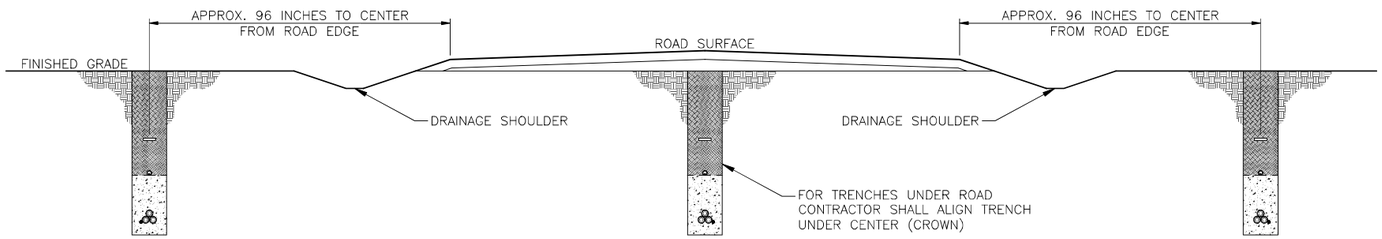


E MET TOWER & COMMUNICATION DITCH
Not to Scale



F TRENCH LOCATION RELATIVE TO ACCESS ROADS
Not to Scale

Figure 5: Typical Cable Trench Details

NOTES

1. ALL EXISTING UTILITIES MUST BE LOCATED BEFORE ANY EXCAVATION/TRENCHING IS STARTED. REGARDLESS OF OTHER UTILITY CONTACTS, CONTRACTOR MUST NOTIFY LOCAL LOCATING CLEARING HOUSE (I.E. ONECALL) OR OTHER STATE BODY.
2. ALL GRADE SURFACES THAT ARE DISTURBED SHALL BE RESTORED TO ESSENTIALLY ORIGINAL CONDITION AND TO THE SATISFACTION OF THE OWNER.
3. THE CABLE ROUTE TO BE FOLLOWED BY CONTRACTOR SHALL BE AS STAKED BY THE OWNER. ALL TRENCHES SHALL FOLLOW AS STRAIGHT A LINE AS PRACTICAL. ANY DEVIATION FROM THE ROUTING PROVIDED SHALL BE DISCUSSED WITH AND APPROVED BY THE OWNER PRIOR TO CONSTRUCTION. ROCK MAY BE REMOVED BY ANY MEANS CONTRACTOR PREFERS, EXCEPT BLASTING. BLASTING WILL NOT BE PERMITTED UNLESS SPECIFICALLY AUTHORIZED BY OWNER.
4. IF THE GROUND WATER LEVEL IS ABOVE THE BOTTOM OF THE TRENCH THE CONTRACTOR AND OWNER SHALL DISCUSS AND AGREE UPON AN ALTERNATIVE CABLE INSTALLATION METHOD. IF THE GROUND WATER LEVEL IS BELOW THE BOTTOM OF THE TRENCH THE FOLLOWING REQUIREMENTS SHALL BE SATISFIED:
   - 4.a. EVERY TRENCH MUST BE A MINIMUM OF 12–INCHES WIDE (WITH PROPER SLOPE FOR WEAK SOILS), AND MUST PROVIDE SUFFICIENT SPACE TO ALLOW COMPACTION AS SPECIFIED WITH THE EQUIPMENT BEING UTILIZED. THE CONTRACTOR SHALL ENSURE THAT SUFFICIENT AMOUNT OF FINE SOIL IS ADDED ABOVE CABLE FOR BACKFILLS.
   - 4.b. THE TOP SOIL MUST BE PUSHED TO ONE SIDE OF THE TRENCH ROUTE AND KEPT SEPARATE FROM BASE MATERIAL. THE STORED TOP SOIL IS TO BE SPREAD UNIFORMLY OVER THE AREA DISTURBED BY TRENCHING FOLLOWING BACKFILL AND COMPACTION.
   - 4.c. CONTRACTOR SHALL PROTECT ALL TRENCHES AND OTHER EXCAVATIONS FROM SURFACE WATER RUNOFF. ANY WATER THAT HAS ACCUMULATED IN THE EXCAVATION SHALL BE REMOVED AND ANY SOFT TRENCH BOTTOM REMOVED AND REPLACED PRIOR TO THE INSTALLATION OF THE CABLES. THIS INCLUDES REMOVAL AND REPLACEMENT OF SAND BACKFILL THAT HAS BECOME CONTAMINATED WITH SILT, ROCKS, MUD, CLAY, ETC. THE REMOVAL OF WATER AND CORRECTION OF SOFT GROUND CONDITIONS DUE TO SURFACE WATER WILL BE THE RESPONSIBILITY OF CONTRACTOR.
   - 4.d. CONTRACTOR MUST PROTECT THE PUBLIC AND LIVESTOCK FROM ALL TRENCHES AND EXCAVATIONS BY UTILIZING SUITABLE BARRICADES OR OTHER WARNING DEVICES.
   - 4.e. ALL TRENCHES SHALL BE EXCAVATED TO DEPTH AS NECESSARY TO MAINTAIN THE SPECIFIED COVER OVER THE INSTALLED CABLE. IF THE BOTTOM OF THE TRENCH CONTAINS ROCKS, WOOD, VEGETATION MATERIAL OR OTHER HARD, ROUGH, OR SHARP MATERIALS THAT COULD DAMAGE THE CABLE, THE TRENCH SHALL BE OVER–EXCAVATED AND BACKFILLED WITH A 4–INCH LAYER OF COMPACTED FINE CLEAN SOIL (NOTHING LARGER THAN WHAT WOULD PASS THROUGH A 3/8–INCH SCREEN) OR SAND PRIOR TO THE CABLE BEING LAID IN PLACE.
5. ALL DIRECT BURIED POWER CABLES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING:
   - 5.a. 34.5kV CABLES SHALL BE PLACED IN A TRIANGULAR CONFIGURATION, WITH NO INTENTIONAL SEPARATION, SECURED TOGETHER AS NEEDED WITH CABLE TIES TO ENSURE THEY REMAIN IN THIS CONFIGURATION DURING AND AFTER INSTALLATION & BACK–FILL. PROPER TIE–WRAP TOOLS SHALL BE USED TO PREVENT OVER–TIGHTENING OF THE CABLE TIE.
   - 5.b. A 4/0 BARE COPPER WIRE SHALL RUN IN THE TRENCH WITH THE POWER CABLES. THERE SHALL BE NO INTENTIONAL SEPARATION BETWEEN THIS WIRE AND THE POWER CONDUCTORS.
   - 5.c. WHEN INSTALLED ABOVE THE POWER CABLES, THE INNERDUCT FOR FIBER OPTIC COMMUNICATION CABLE SHALL BE LAID ON TOP OF THE PADDING MATERIAL. WHEN INSTALLED AT THE SAME DEPTH AS THE POWER CABLE, THE INNERDUCT AND THE POWER CABLE SHALL BE SEPARATED BY A MINIMUM OF 4 INCHES.
   - 5.d. WHERE TWO OR MORE PARALLEL COMMUNICATION CABLES ARE REQUIRED IN TRENCH, LAY EACH INNERDUCT NEXT TO EACH OTHER WHILE STILL MAINTAINING CLEARANCES SHOWN.
6. BACKFILL AND COMPACTION REQUIREMENTS ARE AS FOLLOWS:
   - 6.a. ALL EXCAVATED AREAS, INCLUDING TRENCHES AND BELL HOLES MUST BE THOROUGHLY COMPACTED TO NO LESS THAN 85% STANDARD PROCTOR OR 105 PCF, UNLESS OTHERWISE NOTED. COMPACTION SHALL BE BY PROVEN METHODOLOGY. SPECIAL CARE MUST BE TAKEN IN THE AREAS WHERE THE THERMAL TESTING OF SOILS IN THAT AREA INDICATES A POTENTIALLY HIGH RESISTIVITY. COMPACTION BY FLOODING WILL NOT BE PERMITTED.
   - 6.b. THE FIRST 12–INCHES OF BACKFILL ABOVE THE CABLE (THIS IS THE CABLE PADDING) MUST BE FREE OF ROCKS, TOP SOIL, ROOTS, AND OTHER ORGANIC MATTER (NOTHING LARGER THAN WHAT WOULD PASS THROUGH A 3/8–INCH SCREEN). IF HEAVY STIFF CLAY IS ENCOUNTERED, THE NATIVE MATERIAL MUST BE EITHER MIXED WITH SANDY SOIL FROM OTHER STRATA IN THE SAME TRENCH, MIXED WITH FINE GRADE SAND THAT IS IMPORTED, OR REPLACED WITH IMPORTED MATERIAL.
   - 6.c. SELECT NATIVE SOIL CAN BE USED FOR THE REMAINDER OF THE TRENCH BACKFILL EXCEPT THAT LARGE CLUMPS AND ROCKS LARGER THAN 4–INCHES MUST BE EXCLUDED AND SUFFICIENT FINES PROVIDED TO ELIMINATE VOIDS.
   - 6.d. AT THE BEGINNING OF THE TRENCH BACKFILLING OPERATION, THE CONTRACTOR AND THE OWNER SHALL DETERMINE THE SUITABILITY OF THE NATIVE SOIL FOR USE AS BACKFILL, AND ANY ADDITIONAL MEASURES THAT MAY BE REQUIRED TO ENSURE ADEQUATE COMPACTION.
   - 6.e. THE CONTRACTOR SHALL FILL THE TRENCH TO PRE–CONSTRUCTION GRADE WITH THE STOCKPILED TOP SOIL AND WITH ADDITIONAL BACKFILL ADDED TO ALLOW FOR SETTLING. CONTRACTOR MAY SLIGHTLY OVERFILL TRENCH IN ORDER TO ALLOW FOR SETTLING.
7. CONTRACTOR SHALL PROVIDE AND INSTALL A PLASTIC WARNING TAPE IN ALL TRENCHES DURING BACKFILLING. THIS TAPE SHALL BE INSTALLED APPROXIMATELY 24–INCHES ABOVE THE CABLES. THE TAPE SHALL BE 6" WIDE, RED WITH BLACK LETTERS, MARKED "CAUTION – BURIED ELECTRIC LINES BELOW".
8. EXCAVATED SOIL AND ROCK THAT IS NOT REUSED IN BACKFILLING THE TRENCHES IS TO BE DISTRIBUTED ACROSS THE SITE PER THE DIRECTION OF THE OWNER.
9. ALL EXCAVATION, TRENCHING AND ELECTRICAL SYSTEM CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THE FORMAL STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE PROJECT.

CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK	APR

NO.	REVISIONS	DATE	BY	CHK	APR

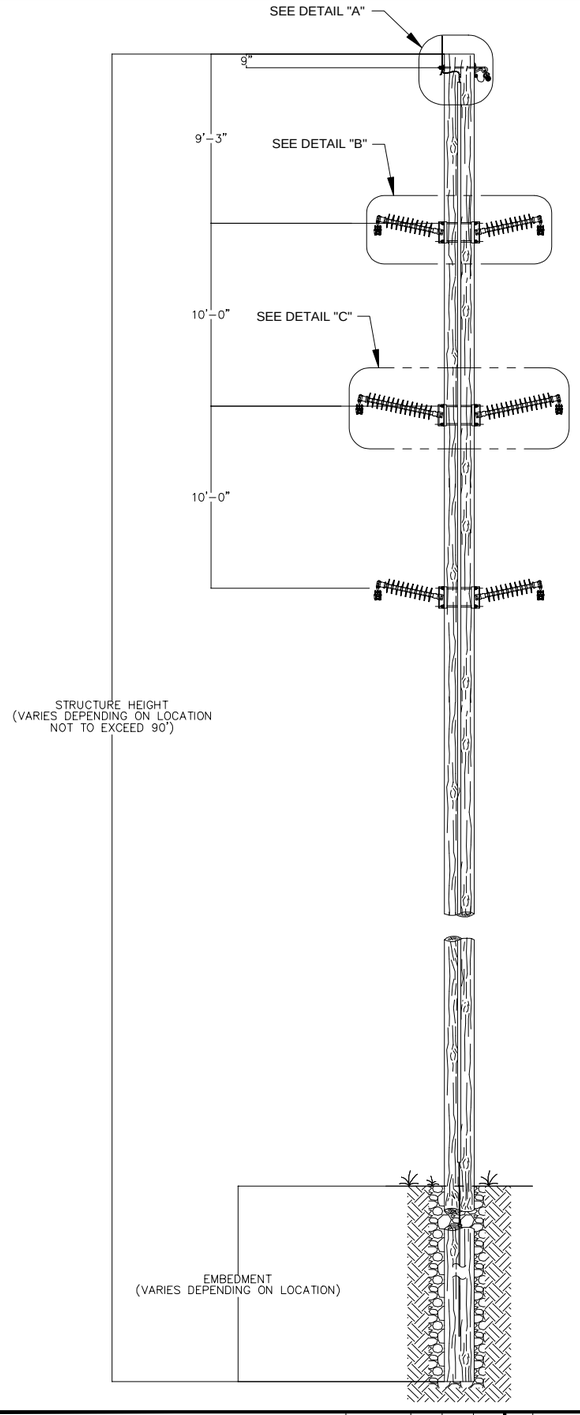
AVANGRID RENEWABLES

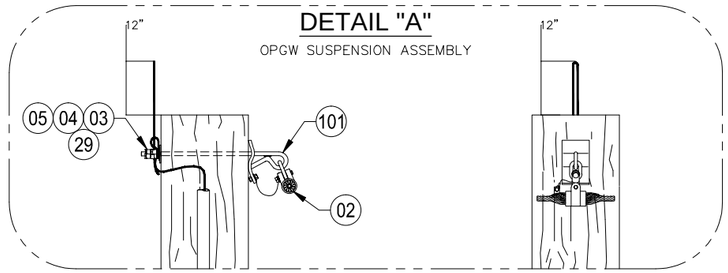
ENGINEERING RECORD	DATE
DRAWN:	
DESIGNED:	
CHECKED:	
APPROVED:	

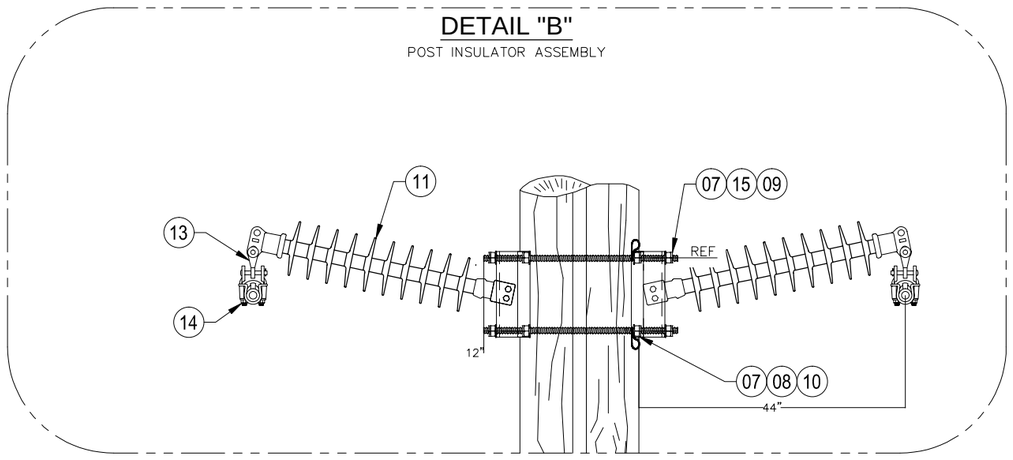
CADFILE: Trench Details.dwg

FOUNTAIN WIND PROJECT
UNDERGROUND COLLECTOR SYSTEM
CABLE TRENCH DETAILS

SCALE: NONE | DWG.NO. | SHEET | REV







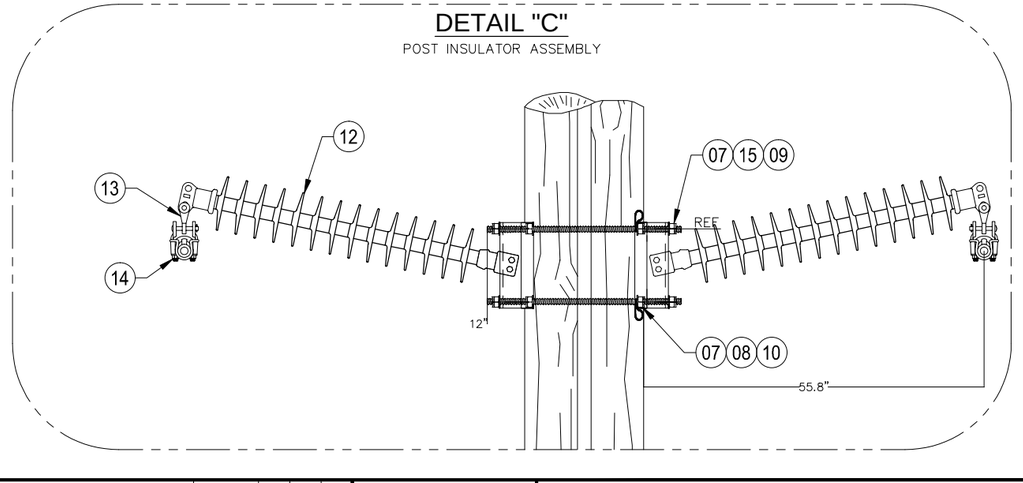


Figure 6: Typical Overhead Collector Line Pole

CONCEPTUAL DESIGN
NOT FOR CONSTRUCTION

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NO.	REVISIONS	DATE	BY	CHK	APR

AVANGRID RENEWABLES

ENGINEERING RECORD	DATE
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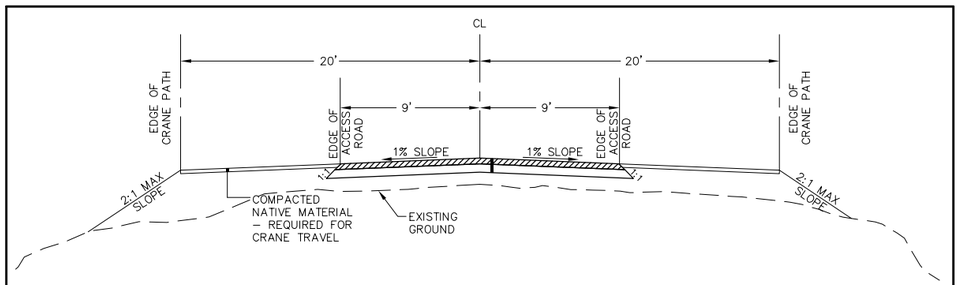
DESIGNED:	
CHECKED:	
APPROVED:	
CADFILE:	

FOUNTAIN WIND PROJECT
OH COLLECTION
DOUBLE CIRCUIT TANGENT

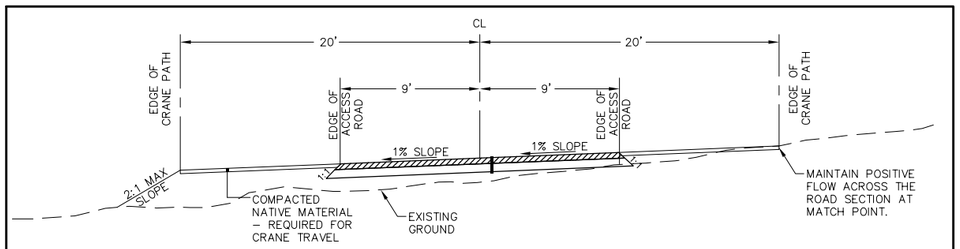
SCALE:	DWG.NO.	SHEET	REV



NOTES:

1. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 1.0%
3. ALL FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE MOST RECENT VERSION OF ASTM D–698 OR AN APPROVED ALTERNATIVE STANDARD.

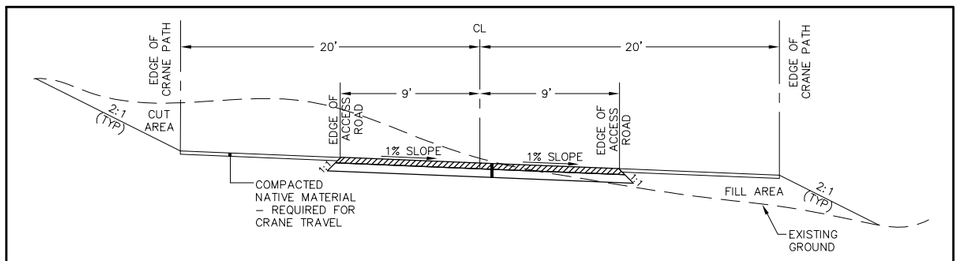
	PRIVATE ACCESS ROAD – RIDGE SECTION	LAST REVISED: 03/14/13 RD01–A



NOTES:

1. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 1.0%
3. GRADE ROAD SURFACE AND SHOULDERS TO MAINTAIN EXISTING DRAINAGE PATTERNS AND ALLOW SHEET FLOW ACROSS THE ROAD PROFILE.
4. ALL FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE MOST RECENT VERSION OF ASTM D–698 OR AN APPROVED ALTERNATIVE STANDARD.

	PRIVATE ACCESS ROAD – RELATIVELY FLAT GROUND	LAST REVISED: 03/14/13 RD01–B



NOTES:

1. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 1.0%
3. GRADE ROAD SURFACE AND SHOULDERS TO MAINTAIN EXISTING DRAINAGE PATTERNS AND ALLOW SHEET FLOW ACROSS THE ROAD PROFILE.
4. ALL FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE MOST RECENT VERSION OF ASTM D–698 OR AN APPROVED ALTERNATIVE STANDARD.

	PRIVATE ACCESS ROAD – CUT SECTION	LAST REVISED: 01/02/13 RD01–C

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Fountain Wind Project

Shasta County, California

Access Road Details

Figure 7a: Access Road Cross Section Details

NOT FOR CONSTRUCTION

Date: 6/19/17
Sheet: 1 OF 1

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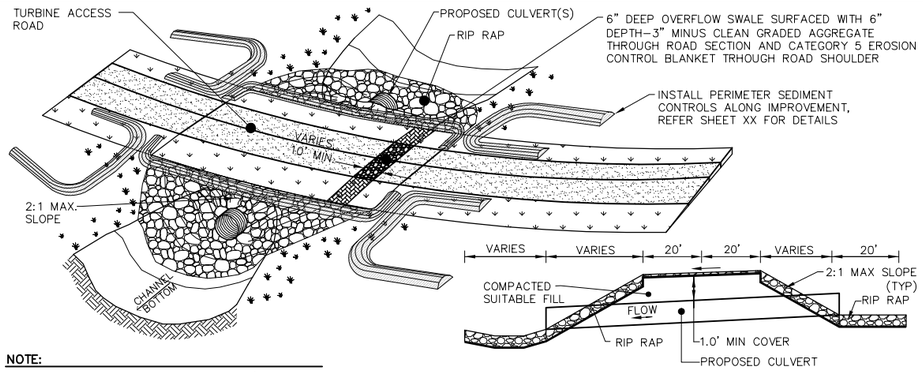


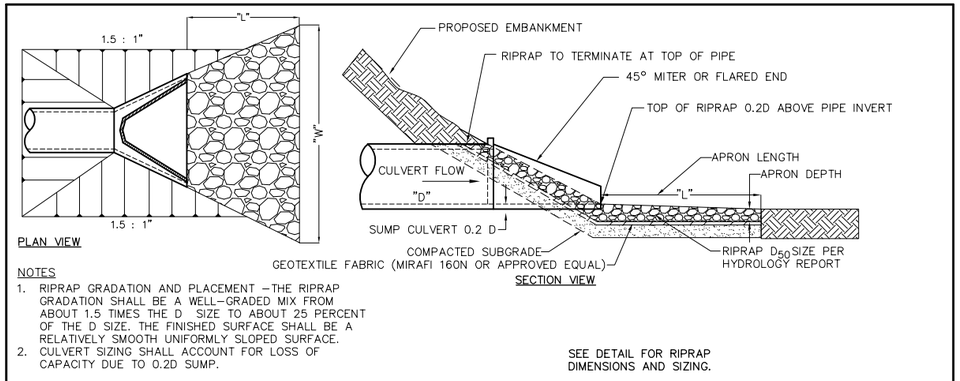
NOTE:

1. MINIMIZE DISTURBANCE TO THE STREAM/DITCH DURING CULVERT INSTALLATION.
2. RESTORE DISTURBED AREA TO NATIVE CONDITIONS IN ACCORDANCE WITH THE SWPPP.
3. CULVERT INSTALLATION SHALL CONFORM WITH MANUFACTURERS RECOMMENDATION FOR INSTALLATION.
4. SUMP CULVERT BELOW FLOW LINE PER DETAIL RD12D.

TYPICAL TURBINE ACCESS ROAD DRAINAGE CROSSING–CULVERT

LAST REVISED: 10/14/16

RD12–A



PLAN VIEW

SECTION VIEW

NOTES

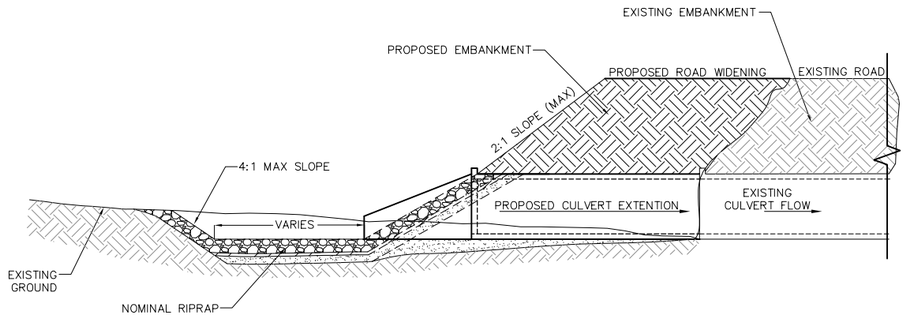
1. RIPRAP GRADATION AND PLACEMENT – THE RIPRAP GRADATION SHALL BE A WELL–GRADED MIX FROM ABOUT 1.5 TIMES THE D SIZE TO ABOUT 25 PERCENT OF THE D SIZE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.
2. CULVERT SIZING SHALL ACCOUNT FOR LOSS OF CAPACITY DUE TO 0.2D SUMP.

SEE DETAIL FOR RIPRAP DIMENSIONS AND SIZING.

PIPE/CULVERT OUTLET APRON

LAST REVISED: 4/18/17

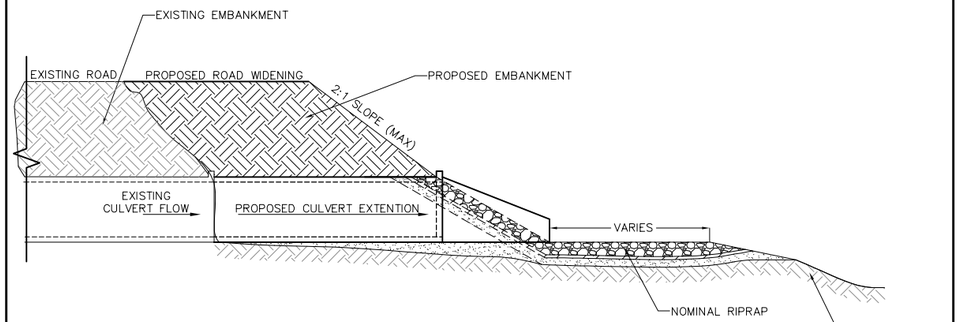
RD12–D



PIPE/CULVERT INLET EXTENSION AT ROAD WIDENING

LAST REVISED: 03/14/13

RD12–H



PIPE/CULVERT OUTLET EXTENSION AT ROAD WIDENING

LAST REVISED: 03/14/13

RD12–I

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Fountain Wind Project

Shasta County, California

Drainage Details

Figure 7b: Access Road Cross Section Details

NOT FOR CONSTRUCTION

Date: 6/19/17
Sheet: 1 OF 1

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Figure 8a: O&M Facility Plan and Profile

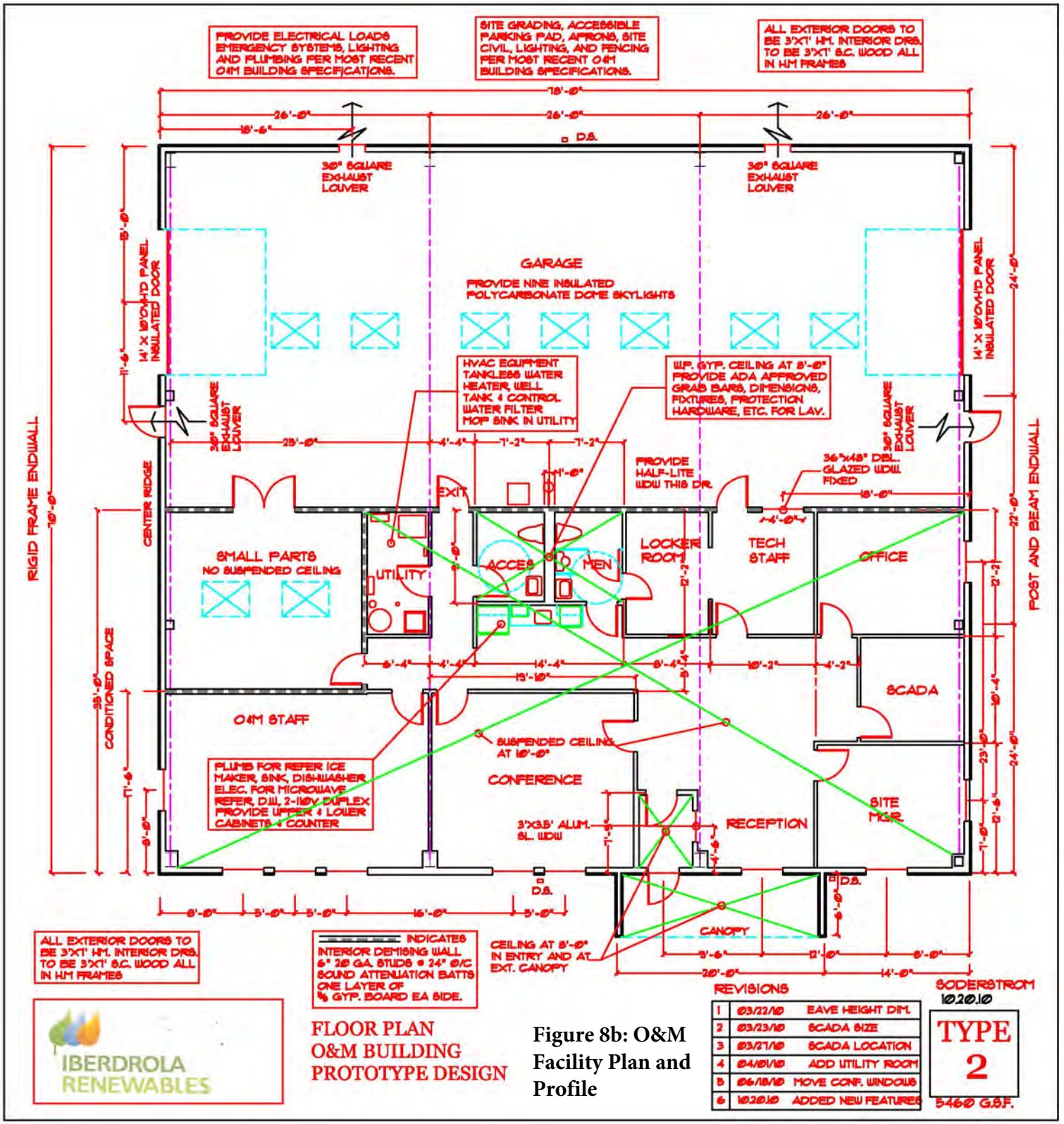
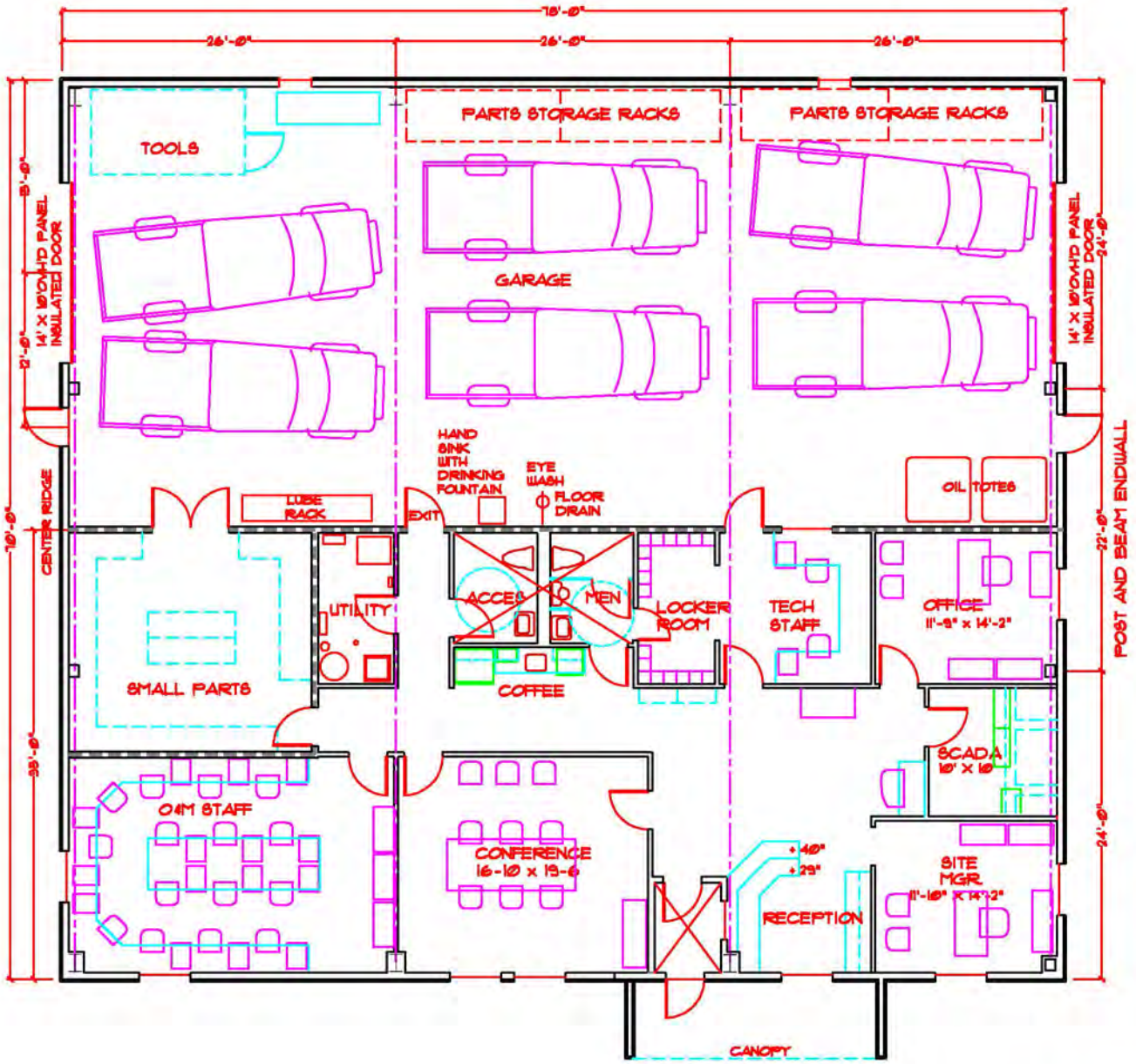


Figure 8b: O&M Facility Plan and Profile



IBERDROLA RENEWABLES

USE PLAN
O&M BUILDING
PROTOTYPE DESIGN

Figure 8c: O&M Facility Plan and Profile

REVISIONS

1	03/22/10	EAVE HEIGHT DIM.
2	03/23/10	SCADA SIZE
3	03/27/10	SCADA LOCATION
4	04/01/10	ADD UTILITY ROOM
5	06/18/10	MOVE CONF. WINDOWS
6	10.20.10	ADDED NEW FEATURES

SODERSTROM
10.20.10

TYPE 2

5460 G.S.F.

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Figure 9: Site Plan O&M Facility

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Prepared for:

AVANGRID RENEWABLES

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Portland, OR 97209

N

0' 50' 100' 150'

Fountain Wind Project

Shasta County, California

O&M Exhibit

NOT FOR CONSTRUCTION

Date: 09/05/17
Sheet: 1 OF 1

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6.0 APPENDICES

Appendix A DESKTOP GEOTECHNICAL REPORT

Fountain Wind Project

Shasta County, California

Desktop Study

Prepared for

January 2017

Fountain Wind Project

Shasta County, California

Desktop Study

Prepared for

January 2017

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Minneapolis, MN 55435-4803
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Fountain Wind Project Desktop Study

January 2017

Contents

List of Tables

List of Figures

1.0 Executive Summary

The Fountain wind project is located in central Shasta County, about 10 miles west of the town of Burney (Figure 1). The project area is on the edge of the recent Cascade volcanics near where they transition to the Klamath Mountains to the west. The site is generally rolling hills on basaltic lava flows. Fountain is tentatively planned as a 200 MW project using 57 Gamesa G132 turbines.

1.1 Foundation Design

Based on the soil conditions expected at the site, a spread footing is an economical option. Rock anchors or sockets may also be feasible alternatives in isolated areas if site bedrock has adequate strength and joint characteristics. Surficial soils at the site generally pose a low to moderate risk for concrete and steel corrosion. Shallow groundwater may be perched on bedrock surfaces on ridgelines and may require localized drain systems. Ancillary structures in the valleys of the project area may be affected by shallow groundwater levels.

1.2 Civil Design

The climate has wet, cool winters and dry and hot summers. With the elevation of the proposed turbines flooding is not a concern. The project area drains to the Sacramento River.

Access to the site is limited. The project area has some steep slopes exceeding 25%. And there are topographical challenges to the site.

The availability of granular material for road construction is assumed to be good. Barr anticipates the method for constructing access roads in areas with exposed or shallow bedrock will be will be to build the roads with 6 to 8 inches of gravel or suitable road base material on a geotextile fabric. In areas with a significant thickness of soil, the method of road construction will be to strip off the upper layers of unsuitable soil, thoroughly compact the subgrade, and build the roads with 10 to 14 inches of gravel or suitable road base material on a geotextile fabric.

1.3 Electrical Design

The site soils tend to be thin and stony, with low clay content, and the climate is warm and dry. The electrical resistivity may be high and the shallow rock may complicate grounding.

The soil density suggests the soil thermal resistivity will be in the range of 200 to over 700 °C-cm/W. Excavation for the collection system will be difficult due to the shallow competent bedrock.

1.4 Geotechnical Investigation

Based on this desktop review and Barr's experience on wind power developments with similar geological terrains, a preliminary investigation may not be warranted given the expected site conditions. In their current state, proposed turbine locations are largely inaccessible to drill rigs or other heavy equipment

due to the site's thick forest growth. Thick, compressible, or weak soil layers are not anticipated at the turbine sites, which reduces the need for a preliminary geotechnical drilling.

The review of geologic and geotechnical risks completed as part of the desktop study indicate that there are potential concerns related to depth of bedrock, corrosion potential for buried metal and concrete structures, and slope stability. There is the potential for areas of lower strength or high compressibility soils, though due to limited soil thickness, soil strength and compressibility considerations will not likely affect turbine foundation design. Consideration of rock anchors and socket foundations would require in-depth investigation of bedrock properties at proposed turbine locations. Based on Barr's experience with similar geology, rock anchor and socket foundations may not be economical due to the quality and variability of the volcanic and sedimentary bedrock, despite its shallowness.

Aspects of a preliminary geotechnical investigation could be performed during a site visit. Samples could be obtained with a backhoe to provide thermal resistivity, compaction, and corrosivity test results for time-sensitive aspects of the electrical collections system, roadway, and foundation design. Barr estimates that these aspects of a preliminary geotechnical investigation will cost about $20,000, depending upon scope desired. The recommended scope would be to:

- Obtain soil and rock samples to identify soil engineering properties and soil reactivity
- Preliminarily characterize site bedrock for excavatability, and, to a lesser extent, the use of rock anchor or socket foundations
- Document the presence of shallow groundwater (if present) and shallow bedrock
- Preform preliminary site reconnaissance for field identification of geotechnical risks such slope instability
- Collect bulk samples of soils to evaluate thermal resistivity and backfill density
- Preliminary geotechnical report summarizing investigation, site reconnaissance, and limited laboratory testing

Table 1 Geological Hazard Summary

Hazard	Likelihood	Potentially Fatal Flaw	Significance	Potential Mitigation Measures	Recommended Next Steps	Timing	Next Step Cost
Slope failure (Figure 3 and Figure 8)	High in places	No	Some locations may be at risk. Proposed turbine location I5 is at the head of a slope failure that may be associated with development of a downslope road.	• Slope stability evaluation	Site-by-site stability evaluations.	Preliminary or Design Phase	None. Will be assessed during normal investigation
Shallow bedrock (Figure 12)	High	No	Low cost of investigation and moderate cost of mitigation	• Raised foundation design • Blasting for excavations	Drilling and soil testing	Preliminary or Design Phase	None. Will be assessed during normal investigation

2.0 Description of Project

The Fountain wind project is located in central Shasta County, about 10 miles west of the town of Burney (Figure 1). Figure 2 is a map of the project site, showing proposed turbine locations. Fountain is tentatively planned as a 200 MW project using 57 Gamesa G132 turbines.

3.0 Purpose and Scope

The scope of the work is limited to review and assessment of readily available existing information. The goals of this report are to:

- Review readily available existing information, such as geologic maps and reports, geophysical reports, topographic maps, wetlands maps, FEMA flood maps, proposed development maps, and aerial photographs.
- Summarize geologic/geotechnical conditions.
- Identify and qualify geologic/geotechnical risks.
- Recommend a geotechnical investigation approach.
- Summarize soil conditions as it relates to electrical design parameters, thermal, and electrical conductivity.
- Recommend whether or not a preliminary field investigation is warranted and, if so, recommend a scope.
- Address feasible foundation options and issues.
- Identify potential roadway issues.
- Provide conceptual-design level cost estimates.

4.0 Site Geology

The Fountain wind project is on the edge of the recent Cascade volcanics near where they abut the Klamath Mountains to the west. A short distance to the southwest is the northern end of the Great Valley, and the northern end of the Sierra Nevada Mountains is to the southeast. Directly east is the Modoc Plateau. Figure 3 is a topographic map of the project area.

From northern California up to the central coast of Canada, the Pacific plate is sliding under the North American plate, and one result is the vast number of volcanoes and volcanic deposits in this region. Mt Shasta and the other Cascade Mountains are the prominent volcanoes, but there are many smaller examples. The Modoc Plateau is a large lava plain, and is an extension of the Columbia River basalts of Oregon and Washington. These volcanic deposits are generally interspersed with accreted terrain like the Klamath Mountains. As the plates come together, small masses of land that were on the Pacific plate, and were lighter in mass than oceanic crust, smeared onto the North American plate rather than sliding under, sometimes with bits of oceanic crust and deeper earth materials. The Klamath Mountains are a large area of such land (Sawyer, 2006).

The site is between three volcanic centers that are considered to be active (Shasta County, 2011):

- Medicine Lake volcano has erupted at least seven times in the past 4,000 years, most recently about 950 years ago
- Mount Shasta erupted with pyroclastic flows in 1786, and has had relatively minor activity since
- Lassen Peak experienced a series of small explosions in 1914 that was followed by destructive lava flows in 1915

4.1 Bedrock Geology

Figure 4 shows the geology of the area; this map is based on data available from the web, consistent with the Bedrock Geologic Map of California: Westwood Sheet (Lyndon et al, 1960).

The site is primarily underlain by Tertiary andesite (an intermediate volcanic rock, between a rhyolite and a basalt), with basalt and pyroclastics, between 2 and 5 million years old. The extreme northern part of the site is underlain by a younger andesite. The extreme west-central part of the site is underlain by Eocene (56-33.9M years old) sandstone mapped as non-marine by Lyndon et al. (1960). It is likely the volcanics were deposited on an uneven surface of older deposits like the Eocene sandstone, and so the thickness of the volcanics may vary considerably and the top and bottom elevations vary.

The individual formations are not identified on the geologic map. According to Lydon and O'Brien (1964), the most widespread and continuous unit is the Tuscan Formation. The Tuscan contains over 300 cubic miles of volcanic debris, extending many miles to the south. In the area of the site, the Tuscan Formation is overlain by the later succession of Pliocene basalts and andesites, which are the uppermost bedrock under most of the site. These lava flows originated from eruptive centers in the higher elevations of the

Cascade Range. These were later intruded by even younger Quaternary volcanics, such as Burney Mountain, Magee Peak, and Mounts Shasta and Lassan.

The site is bounded by fault lines on the east that have been active since Quaternary time: the Hatchet Mountain fault, active in the last 1.6M years, unnamed faults active in the last 600,000 to 1.2M years, and the Rocky Ledge fault which has been active in the last 15,000 years.

4.2 Soils

Figure 5 shows the soil map unit names, which are summarized by turbine locations below:

- CmD, CmE: Cohasset stony loam: 23 proposed turbine sites
- WeD, WfG: Windy and McCarthy stony sandy loams: 14 proposed turbine sites
- 173im, 174im Gasper-Scarface complex: 8 proposed turbine sites
- CrD: Cohasset-McCarthy complex: 4 proposed turbine sites
- 179im: Goulder gravely sandy loam 3 proposed turbine sites
- 266im: Obie-Mounthat complex: 3 proposed turbine sites
- JdE: Josephine gravelly loam, moderately deep: 1 proposed turbine sites
- LhE: Lyonsville-Jiggs complex, deep: 1 proposed turbine sites
- TcE: Toomes very rocky loam: 1 proposed turbine sites

As with the other soils, the soil complexes are similarly gravely and stoney loams. The parent materials are volcanic ash, lava flows, and volcanic rocks, consistent with the geologic mapping. The Gaspar-Scarface and Goulder soils tend to be the thickest (greater than 200 cm); the others are thin soils over a restrictive layer.

Figure 6 shows the USCS classifications of the surficial soils, which are dominated by silty sands and silty gravel. Most of the proposed turbine locations are underlain by silty gravel.

4.3 Groundwater

Groundwater occurrence is not well documented, and the State of California does not yet release well information on line. According to one report (California Department of Water Resources, June 1984) groundwater production from the volcanic deposits can vary. The volcanic sediments in the Tuscan Formation may yield good amounts of groundwater. The overlying lava flows may be fractured and brecciated and vesicular enough to produce good amounts of groundwater. However, the project area has significant relief and the proposed turbine locations are on high ground. While there is some potential for perched water to occur if an area is underlain by a more crystalline deposits, in most places the

groundwater should be at sufficient depth that it is inconsequential to the project development. This is generally supported by the NRCS soil mapping of depth to water (Figure 7).

4.4 Economic Geology

While there are some oil and gas leases in the County, there is no evidence of exploration or development in the proposed project area.

The Klamath Mountains east of the site contain several mining districts with deposits of copper-zinc, gold, and silver, along with many other mineral commodities including metals, minerals (asbestos and talc), limestone, dimension and crushed stone, and sand and gravel. The volcanic and associated sediments in the Cascade Range, where the site is located, is a source of pumice, cinders, crushed and decorative stone, and sand and gravel (Lyndon and O'Brien, 1974).

5.0 Geologic/Geotechnical Risks

Table 2 Summary of Geologic Hazards

Hazard	Present at Site?	Comment
Flooding/High groundwater	No	The proposed turbine locations are on high ground (Figure 3). FEMA does not project any flood zones in the project area.
Slope failure	Yes	Landslides are apparent on Google Earth^{tm} imagery, notably not far from the proposed I5 turbine location (Figure 8).
Subsidence – Pumping	No	There is little to no irrigation or other high-demand pumping in the region.
Subsidence – Mining	No	Mining has not historically taken place in the project area, although there is mining in the region.
Subsidence – Caves/Karst	No	There are no carbonate or sulfate sedimentary rocks present in the project area (Figure 4).
Earthquake – Seismicity	No	This is a seismically active region, although the area of the site is relatively low hazard (Figure 9; Shasta County, 2011). http://earthquake.usgs.gov/hazards/products/conterminous/
Earthquake – Ground rupture	No	There are no active faults mapped in the region. http://earthquake.usgs.gov/hazards/qfaults/map/
Liquefaction	No	There is low seismicity in the region.
Swelling/ shrinking soil	No	NRCS indicates site soils have low plasticity indices.
Settlement	Unlikely	Some proposed turbine locations are underlain by clayey soil. However, most soils are relatively thin.
Corrosive soil (Steel)	Unlikely	The majority of the site is rated as moderately corrosive by NRCS (Figure 10).
Corrosive soil (Concrete)	Unlikely	The majority of the site is rated as moderately corrosive by NRCS (Figure 11).
Reactive aggregate (ASR)	Unlikely	There should be a variety of aggregate sources.
Made ground	Unlikely	The proposed site is undeveloped and heavily forested.
Collapsible soil	No	The geology and climatic conditions are not suitable for the formation of collapsible soils.
Volcanic activity	Yes	There is known volcanic activity in the region. Although most is hundreds to thousands of years old, Mt Shasta and Mt Lassen are still very much active volcanos and Medicine Lake volcano has been active as recently as about 100 years ago (DeCourten, accessed 12/27/16).

The County hazard plan calls out only two geological hazards: seismic activity and volcanoes (Shasta County, 2011). As noted in Table 5-1, while seismically active, the seismicity generally is relatively low intensity and should not be a controlling factor for turbine foundation design.

5.1 Volcanic Hazards

From the Shasta County Mitigation Plan:

> "Volcanoes produce a wide variety of hazards that can kill people and destroy property. Large explosive eruptions can endanger people and property hundreds of miles away and even affect global climate. Some of the volcano hazards, such as landslides, can occur even when a volcano is not erupting.
>
> Volcanic eruptions result in fires, toxic gas emissions, air pollution, extensive ash deposits, and could catalyze earthquakes, landslides, and floods. Ash deposits can create public health, telecommunications, and structure damage hazards."

The site is about 40 miles from Mt Shasta, 25 miles from Mt Lassen, and 45 miles from Medicine Lake volcano. The most hazardous areas are those within the surrounding 10 mile radius and the downstream river valleys (https://volcanoes.usgs.gov/volcanoes/mount_shasta/hazard_summary.html and https://volcanoes.usgs.gov/volcanoes/lassen_volcanic_center/hazard_summary.html) may be subject to lava, landslides, and lahars. Ash fall, while generally not as hazardous, can cover a much larger area. It is subject to weather and the nature of the eruption, so it is difficult to predict. Major volcanic events are generally not sudden, but are preceded by a series of smaller events that act as warning. The USGS actively monitors such activity.

5.2 Shallow Bedrock

While depth to bedrock is generally not considered a hazard, shallow bedrock will complicate excavations for roads, turbines and the collection system. Shallow bedrock will also complicate installation of grounding systems. The depth to a restrictive layer (generally bedrock) is generally less than 7 feet, except in the northeast corner of the project site (Figure 12).

6.0 Feasible Foundation Types

Feasible foundation types for the project are selected, in part, based upon a combination of critical geotechnical, climatological, and mechanical factors which drive the design selected.

1. **Geotechnical Factors**. The soils at the site are anticipated to consist of alluvium, colluvium, and residual soil. The ridgelines that host turbines onsite contain thin sandy and gravelly soils with silt. The site has low seismicity of a magnitude that would not supersede the design loads due to wind (IBC, 2009). Shallow groundwater may be present on ridgelines where it is perched on the bedrock surface. This condition may require consideration of localized drainage systems for the foundations. Corrosion of steel and concrete is low to moderate across most of the site.

2. **Climatological Factors**. Flooding is not a concern for turbine foundations. Shallow groundwater may be perched on bedrock surfaces along the ridgelines and within the valleys. Frost action is applicable for this site and so the effects of frost heave should be considered during design.

3. **Mechanical Factors**. The overturning moment for a typical Gamesa G132 wind turbine should be considered.

The following foundation types are feasible based on the combination of critical geotechnical and climatological factors identified:

1. **Spread Footing.** In areas with adequate depth of soil or shallow bedrock, the soil conditions will likely be suitable for support of a spread footing.

2. **Spread Footing on Engineered Fill.** It is anticipated that the majority of the site soils will provide sufficient bearing capacity. If low strength soil deposits are encountered at depths less than 15 feet below the surface, some soil correction (likely consisting of removal and replacement of soil with engineered fill or use of stone columns/Geopiers) may be necessary. If shallow groundwater is encountered, stone columns/Geopiers may be a more desirable soil remediation option.

The following foundation types may be feasible in isolated locations (if site bedrock has adequate strength characteristics) based on the combination of critical geotechnical, climatological, and mechanical factors identified:

1. **Rock Anchor Foundation.** This type of foundation is feasible in shallow (i.e., within 1 to 3 feet of the ground surface), strong, and massive bedrock. Shallow bedrock is present in portions of the site, specifically along the western extents of the project site. This type of foundation is constructed by blasting an excavation approximately 25-35 feet in diameter by 5-7 feet deep into the bedrock, drilling anchors to an approximate depth of 20-50 feet, placing an anchor bolt cage and reinforcing in the excavation, and pouring a concrete cap. This type of foundation is highly dependent on the rock strength, joint patterns, and condition. Because this type of foundation is

highly dependent on the competency of the rock at each turbine location, there is more uncertainty associated with it than with a conventional spread footing.

2. **Rock Socket Foundation.** This type of foundation is only feasible in shallow (i.e., within 1 to 3 feet of the ground surface), strong, and massive bedrock. Shallow bedrock is present in portions of the site, specifically along the western extents of the project site. This type of foundation is constructed by blasting an excavation approximately 20 ft x 20 ft x 20 ft into the bedrock, placing an anchor bolt cage and reinforcing in the excavation, and filling the excavation with concrete. This type of foundation is highly dependent on the rock strength, joint patterns, and condition. Because this type of foundation is highly dependent on the competency of the rock at each turbine location, there is more uncertainty associated with it than with a conventional spread footing.

The following foundation types are not feasible based on the combination of critical geotechnical, climatological, and mechanical factors identified:

1. **Deep Foundations.** Due to the shallow depth of bedrock, deep foundations will likely not be required. Less expensive foundation options are suitable for the site.

2. **Dynamic Compaction of Soil Supporting Spread Footing**. The project site is underlain by competent rock; therefore, remediation of loose soils by dynamic compaction is unnecessary.

Based on the competency of the soil and bedrock expected to be encountered at the project location, it is expected that a conventional spread footing will be the most economical type of foundation. Some soil correction may be necessary in areas where soils exhibit lower strengths or higher compressibility, likely consisting of either (a) removal and replacement of soil with engineered fill, or (b) use of stone columns/Geopiers. Rock anchors or sockets may also be feasible alternatives in isolated areas if site bedrock has adequate strength and joint characteristics.

Most of the turbines are underlain by soil that is moderately corrosive to concrete and steel, as shown in Figure 7 and Figure 8. Corrosive soils may require special cement. At worst, sulfate resistant cement (S02) may be required and result in increased foundation costs on the order of 10-20%. Some corrosion-resistant cements are not readily available and can require several months of testing, so early determination is important.

If Avangrid wants to consider foundation options other than a spread footing, a preliminary phase geotechnical assessment is warranted. In addition, if Avangrid wants to consider foundation options other than a spread footing, then the contractor selection process sooner than normal.

7.0 Electrical Design

As reported by the USDA NRCE, the site soils are primarily clayey and silty sands and gravels, typically very gravely or stony and thin (less than 7 feet thick) over bedrock.

7.1 Soil Electrical Resistivity

The soil types of the site indicate generally low ground electrical resistivity across the project area due to generally clayey soils and deep bedrock.

For most engineering applications in soils, the motion of ions in the interstitial formation water is the dominant factor affecting the electrical resistivity. Ions in the formation water come from the dissociation of salts such as sodium chloride, magnesium chloride, etc. (Mooney, 1980). For water-bearing earth materials, the resistivity decreases with increasing:

1. Fractional volume of the material occupied by water
2. Salinity or free-ion content of the water
3. Interconnection of the pore spaces (permeability)
4. Temperature

The presence of clay minerals tends to decrease the resistivity because: (a) the clay minerals can combine with water; (b) the clay minerals can absorb cations in an exchangeable state on the surface; and (c) the clay minerals tend to ionize and contribute to the supply of free ions.

The general range of electrical resistivities for sandy clays is from 1,000 to 8,000 ohm-centimeters (Ωcm) or 10 to 800 ohm-meters (Ωm). Values can range from 100 to 60,000 Ωcm (1 to 6,000 Ωm) for gravels (Telford, 1976).

Climatic variables, including fluctuating average low and high air temperatures of 15°F to 85°F, are important to note when comparing shallow soil electrical resistivity values to studies from other climates (IEEE, 1983). The electrical resistivity of surficial soils will decrease when the soils are warm, increase when cold, and will be notably higher when soils are frozen. However, the bulk resistivity of soils through the depth of construction is not likely to be impacted by air temperature fluctuations. High soil moisture will decrease resistivity.

Redding, California has a mediterranean climate with dry hot summers and mild winters (https://weatherspark.com/averages/31447/Redding-California-United-States).

The USDA NRCS-NCGC SSURGO database was queried for clay contents of soils across the entire site and for soil in the immediate area of the preliminary turbine locations. About 62 percent of the site in general has soils with low clay content and therefore likely high electrical resistivity. About 45 percent of the

proposed turbine locations have similar low clay/high resistivity soils. Soils across much of the site are area is thin and stoney (Figure 5), so there may be some bedrock interference with grounding.

The American Petroleum Institute (API) provides guidance for the potential corrosivity of materials based upon resistivity measurements (API-651, Cathodic Protection of Aboveground Petroleum Storage Tanks, 1997). Following is the General Classification of Resistivity reference adapted from API 651, Chapter 5.3.1.2, Table 1.

Table 3 Classifications of Resistivity

Resistivity Range, Ωcm	Resistivity Range, Ωm	Resistivity Range, Ω feet	Potential Corrosion Activity
<500	<5	<16	Very Corrosive
500 – 1000	5 - 10	16 – 33	Corrosive
1000 – 2000	10 – 20	33 – 66	Moderately Corrosive
2000 – 10,000	20 – 100	66 – 330	Mildly Corrosive
> 10,000	> 100	> 330	Progressively Less Corrosive

The clay content suggests most site soils have low to moderate corrosivity to steel which is similar to the SSURGO data base rating (Figure 8).

Barr recommends an electrical resistivity survey be conducted in order to confirm grounding and cathodic protection design parameters. The work should be performed in accordance with ASTM method G57 "Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method" (equivalent to IEEE Std. 81). Testing should be conducted at each construction site or at a representative number of sites for each soil type and topographic setting.

7.2 Soil Thermal Resistivity

The best approach is to determine site-specific values during the geotechnical investigation phase. However, it is generally the case that the higher the moisture content, density, and quartz content in the soil, the better the thermal properties with respect to heat dissipation. At this site, the soil densities are very low and quartz contents are moderate, and the moisture content is expected to be low, indicating heat dissipation may be low to very low.

Based on data collected by Barr on several wind farms in the Upper Midwest, it was found there is a correlation between dry density and thermal resistivity. This lab data can be further compared with NRCS soil properties to estimate the relative range of thermal resistivity values. In these comparisons, only the dry density of a soil was used, since moisture content cannot be obtained from the NRCS.

Figure 13 shows a 90% confidence interval applied for the thermal resistivity correlation to dry density.

8.0 Civil Design

Available resources including USGS topographic maps, aerial photography, surface soil properties, and regional flooding and rainfall information were reviewed to identify construction limitations that may be present at the project site, as well as potential issues for long-term operation and maintenance. The information collected and analyzed for the Civil Design review is described in this section.

The climate is characterized as a Mediterranean climate with wet, cool winters and warm, dry summers. The average annual precipitation in the region is 28 inches rain and 35 inches snow. Historical averages show that July through September are typically the dry months. Snowfall typically occurs between the months of November to April with December and January receiving the highest totals. The summers are typically warm and dry with no average monthly temperatures above 71.6^0F.

The proposed turbine locations are on high ground so flooding is not a concern. FEMA does not project any flood zones in the project area.

The project area is located in the Lower Pit River watershed which drains to the Sacramento River.

Highway access to the site is limited to State Route 299, between I-5 and State Route 89. Access to interstate I-5 is in the city of Redding west of the project area. Most of the public roads in the region are paved and graveled roads, though some of the planned turbine sites are a significant distance from the nearest road.

A pair of parallel 230-kilovolt transmission lines owned by PG&E run east-west through the middle of the proposed turbine locations.

There are topographical challenges to the site. The project area has some steep slopes along the ridgelines of southern Cascade Mountains, sometimes exceeding 25%.

The availability of granular material for road construction is good. Several pits are identified from online searches in Shasta County near the project limits, which have been shown to be suitable for road construction aggregate. Road construction materials for the existing Hatchet Ridge Windfarm were provided from a pit just east of the project area near Burney, California.

Barr anticipates the method for constructing access roads in areas with exposed or shallow bedrock will be will be to build the roads with 6 to 8 inches of gravel or suitable road base material on a geotextile fabric. In areas with a significant thickness of soil, the method of road construction will be to strip off the upper layers of unsuitable soil, thoroughly compact the subgrade, and build the roads with 10 to 14 inches of gravel or suitable road base material on a geotextile fabric. The gravel thickness and geotextile specification section will be determined after a geotechnical investigation is performed to determine the CBR values for final design. Existing drainage patterns will be maintained by the use of culverts or other drainage features.

For grading activities that exceed 250 cubic yards movement of earth materials or that disturb 10,000 square feet or more Shasta County requires a grading permit. In addition, for earthmoving activities taking place between October 15 and May 1 a wet weather plan must be prepared by an erosion control specialist.

9.0 Geotechnical Investigation

Some of the geologic and geotechnical hazards outlined in Section 5 have the potential to affect project construction procedures and costs. Many of these hazards can be identified in a site visit and evaluated by obtaining bulk samples of the soil and rock. A full drilling program at the preliminary stage of the project could present significant costs, logistical difficulties, and is likely not required if spread footing foundations are planned for the project site, then a full drilling program is likely not required. However, if alternative foundation types are being considered, then the strength, join patterns, and condition of the near surface bedrock should be assessed during a preliminary investigation.

9.1 Summary of Known Conditions

Based on the information available, the key issues at the project site include: corrosivity to concrete, corrosivity to steel, slope stability, and shallow bedrock. Of these issues, the possible presence of shallow bedrock will have the biggest impact on project risk and cost, from a geotechnical and geological standpoint.

9.2 Recommended Preliminary Investigation

The investigation methods required to address these issues are preliminary and low-cost, such that they may be incorporated into a site visit. For this reason, Barr recommends a preliminary investigation to further evaluate these key geologic and geotechnical issues. The proposed preliminary investigation is summarized below:

1. Complete limited geotechnical investigation of site characteristics:

    a. Collect soil and rock samples with a backhoe to identify soil engineering properties and soil reactivity

    b. Preliminarily characterize site bedrock for excavatability, and, to a lesser extent, the use of rock anchor or socket foundations

    c. Preform preliminary site reconnaissance for field identification of geotechnical risks such slope instability

    d. Further document the presence of shallow groundwater and shallow bedrock

    e. Collect bulk samples of soils to evaluate thermal resistivity and backfill density

    Approximately two or three days will be required to complete the recommended scope for the purposes of the preliminary investigation. It is assumed that the boring locations can be accessed by foot from the established network of gravel roads within/surrounding the site.

1. Complete preliminary geotechnical report summarizing site reconnaissance and limited laboratory testing. Though this would be a preliminary investigation, it will need to be a detailed evaluation

of the key issues noted previously, including soil corrosivity/reactivity, shallow groundwater and, to a lesser extent, soil strength/compressibility.

2. Barr estimates that a preliminary geotechnical investigation will cost approximately $20,000, but will vary depending on specific scope details.

9.3 Design Geotechnical Investigation

The final design geotechnical investigation should confirm the depth to bedrock and the stability of slopes adjacent to the final turbine locations, in addition to the typical design program. If a rock socket or rock anchor foundation is considered for the project, the geotechnical investigation would need to be adjusted to collect the appropriate design data.

Assuming a spread footing foundation, the following sections describe the recommended scope for the final investigation.

9.3.1 Site Reconnaissance

A site reconnaissance should be performed to identify any geologic hazards, such as slope failures, perched ground water, or undocumented fill that may be present onsite. In addition, the survey should consist of measurement and locating slope instability or failure planes within rock outcrops for use in analyzing possible block failure. The field survey should be performed by personnel with a background in engineering geology and wind power development.

9.3.2 Drilling Investigation

Borings provide for the ability to sample soil and rock for visual classification and laboratory testing. The resulting data is used to infer such material properties as friction angle, undrained shear strength, unit weight, soil and rock type classification, and groundwater level.

9.3.3 Seismic Refraction Testing

A field seismic refraction study should be performed to allow for the determination of soil and rock shear modulus for use in stiffness calculations during foundation design. The recommended method is by Multi-channel Analysis of Surface Waves (MASW). Measurements should be taken at approximately ten percent of the proposed turbine locations.

9.3.4 Laboratory Testing and Other Work

Testing that should be performed on split spoon, Shelby tube, and bulk soil samples, as well as rock cores, gathered during drilling and should include (but may not be limited to):

- Grain size, Atterberg limits, moisture content, and Proctor density testing for primary soil classification.
- Unconfined compressive strength (with strain measurement) and/or direct shear testing for determination of soil/rock shear strength, elastic moduli, and bearing capacities.

- Chemical testing, including pH, soluble sulfates, and chloride ions, to identify corrosive soils for use in foundation concrete design.

In addition to the geotechnical investigation recommended above, Barr recommends performing field and laboratory testing for use in design of the electrical infrastructure (by others) and roadway design concurrently. This testing should include field electrical resistivity and laboratory thermal resistivity testing as described in Section 7, as well as soil sampling and laboratory testing and data analysis for roadway design as described in Section 8.

9.3.5 Estimated Costs

Based upon experience with similar projects, assuming exploration is limited to that described above (not including testing for electrical design, civil design, or design of other structures), that site access is such that a water truck may reach the turbine locations, and that no additional clearing is required, the cost of implementing this next phase of work is estimated to be on the order of $150,000 to $200,000.

10.0 Limitations

The opinions and probable costs provided in this report are made on the basis of Barr's experience and qualifications and represent our best judgment as experienced and qualified professionals familiar with the project. The cost opinion is based on project-related information available to Barr at this time and includes a conceptual-level design of the project. The opinion of cost may change as more information becomes available. In addition, since we have no control over the cost of labor, materials, equipment, or services furnished by others, or over the contractor's methods of determining prices, or over competitive bidding or market conditions, Barr cannot and does not guarantee that proposals, bids, or actual costs will not vary from the opinion of probable cost prepared by Barr. If Avangrid wishes greater assurance as to probable cost, additional information will need to be collected.

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Telford, W. M., L.P. Geldart, R.E. Sheriff, and D.A. Keys, 1976, *Applied Geophysics*: Cambridge University Press, New York, pp. 454-455, 860.

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United States Geological Survey (USGS) Website, Accessed February 2016. US Seismic Design Maps Tool. http://earthquake.usgs.gov/designmaps/us/application.php

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Reference Checklist

Record Type	Record Location	Reference Outcome*
Water Well Records (local-electronic)	California has yet to release these http://www.water.ca.gov/groundwater/wells/well_completion_reports.cfm	D
Water Well Records (state-electronic)	California has yet to release these	D
State DOT boring records	www.dot.ca.us	D
USGS Maps (electronic)	http://ngmdb.usgs.gov/	A
USGS Maps (hard copy)	http://pubs.er.usgs.gov /	A
USGS Mining/Mineral maps (electronic)	http://mrdata.usgs.gov/	A
USGS Studies/Reports (electronic)	http://pubs.er.usgs.gov/	A
USGS Studies/Reports (hard copy)	Barr Internal Library, http://pubs.er.usgs.gov/	A
State GS maps (electronic)	http://www.conservation.ca.gov/cgs/publications/Pages/index.aspx	A
State GS maps (hard copy)	http://www.conservation.ca.gov/cgs/publications/Pages/index.aspx	A
State GS local/regional studies (electronic copy)	http://www.conservation.ca.gov/cgs/publications/Pages/index.aspx	A
State GS local/regional studies (hard copy)	http://www.conservation.ca.gov/cgs/publications/Pages/index.aspx	A
State GIS boring records (electronic)		D
Soil Survey Maps (electronic)	http://websoilsurvey.nrcs.usda.govv	A
FEMA Maps (electronic)	FEMA Map Service Center	A
Oil/Gas Exploration Boring Logs	ftp://ftp.consrv.ca.gov/pub/oil/maps/Map_S-1.pdf	A
Earthquake Seismic Hazards (USGS)	http://earthquake.usgs.gov/earthquakes/eqarchives//	A
First Hand Karst/Cave Knowledge	http://www.nssio.org	E
Climate Data (electronic)	http://www.noaa.gov	A

*A = reference was reviewed or ordered from agency

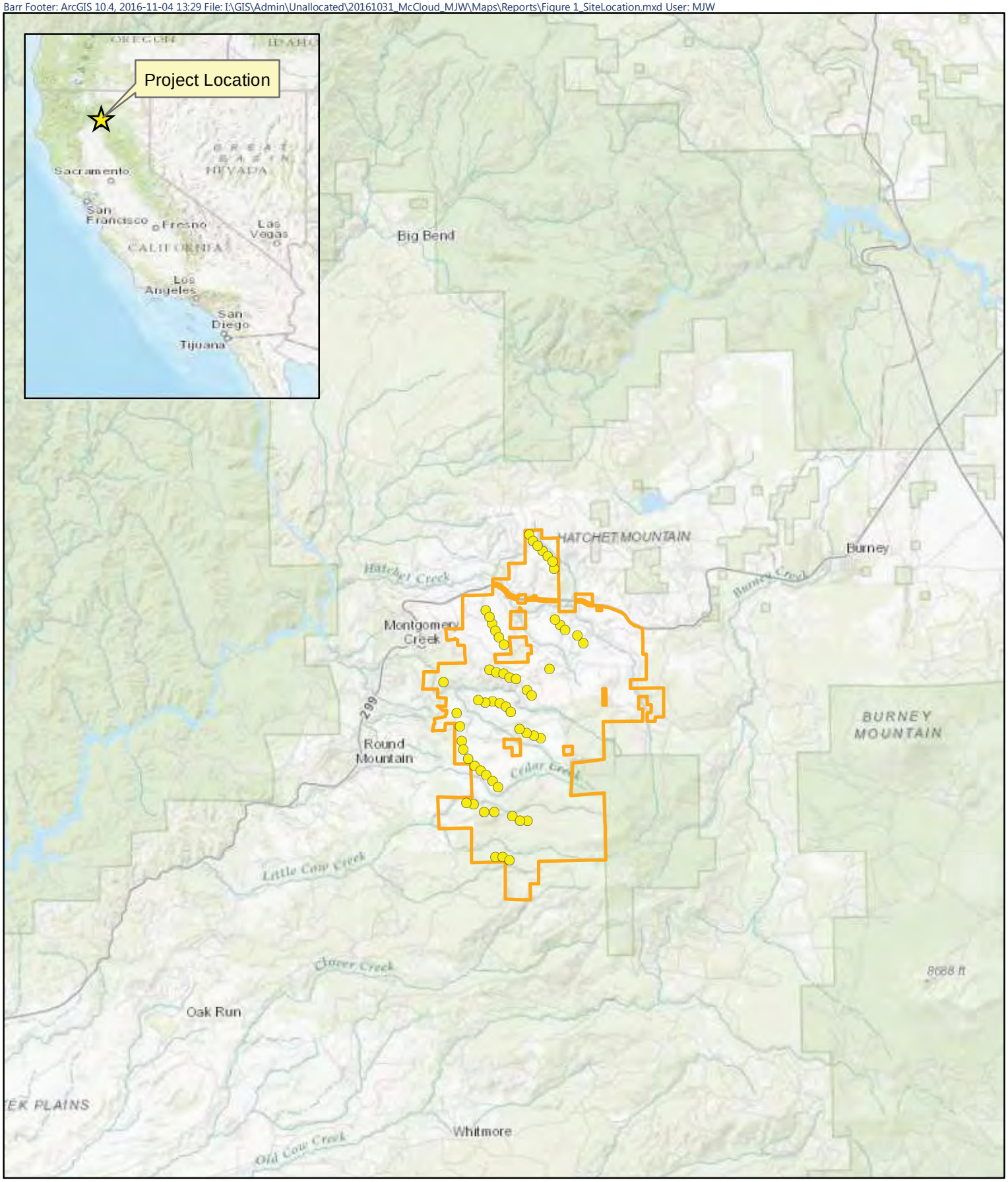
B = reference is available, but only locally and at additional cost

C = reference is potentially available upon special request and at additional cost

D = reference was not found or does not exist

E = reference not applicable to this site

Figures



Turbine Locations

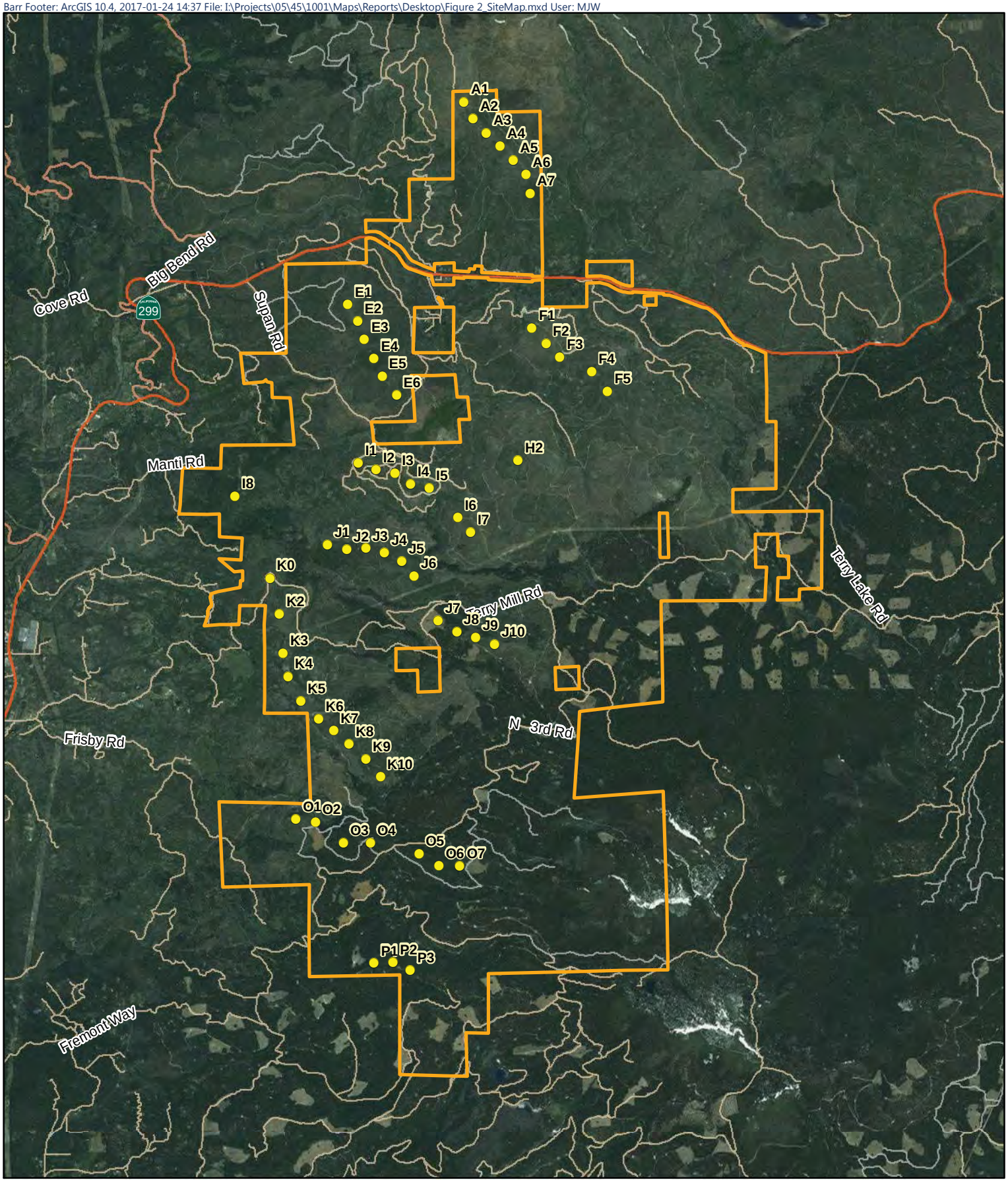
Site Boundary

0 5,000 10,000 20,000

Feet

Figure 1

Site Location
McCloud Project
Avangrid Renewables
Shasta County, California



Turbine Locations
Site Boundary
Primary US and State Highways
Secondary State and County Highways
Local, neighborhood, rural or City Street
4WD

N

0 2,000 4,000 8,000
Feet

Figure 2
Site Map
McCloud Project
Avangrid Renewables
Shasta County, California

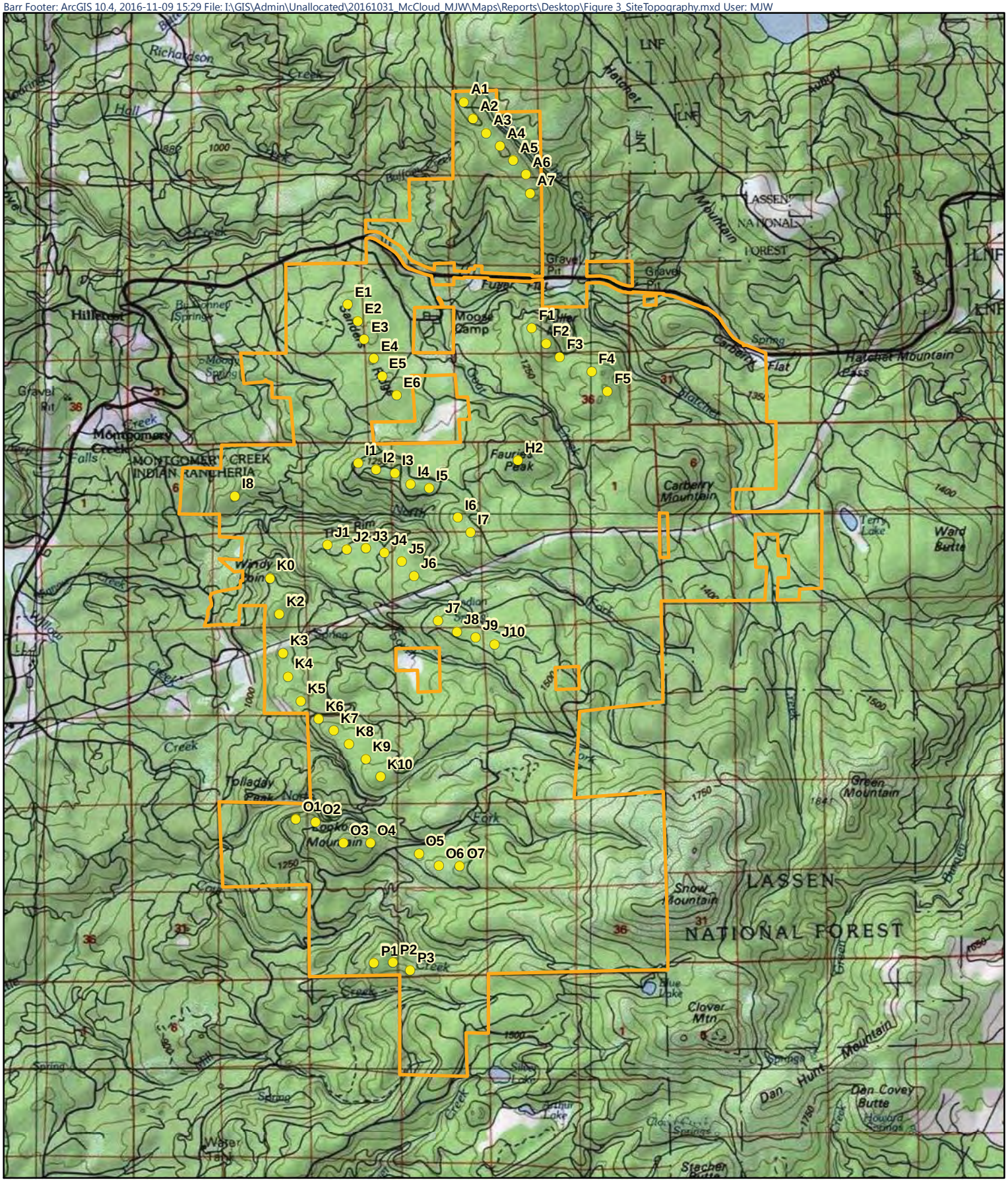


Figure 3
Site Topography
McCloud Project
Avangrid Renewables
Shasta County, California

- Turbine Locations
- Faults
- Site Boundary

Site Geology

- Ec--Eocene--sandstone
- Mzv--Late Permian to Jurassic--intermediate volcanic rock
- Q--Pliocene to Holocene--alluvium
- Qrv--Holocene--andesite
- Qv--Quaternary--andesite
- Tv--Tertiary (2-24 Ma)--andesite
- Water

0 2,000 4,000 8,000
Feet

Source: U.S. Geological Survey, California Geological Survey

Figure 4
Site Geology
McCloud Project
Avangrid Renewables
Shasta County, California

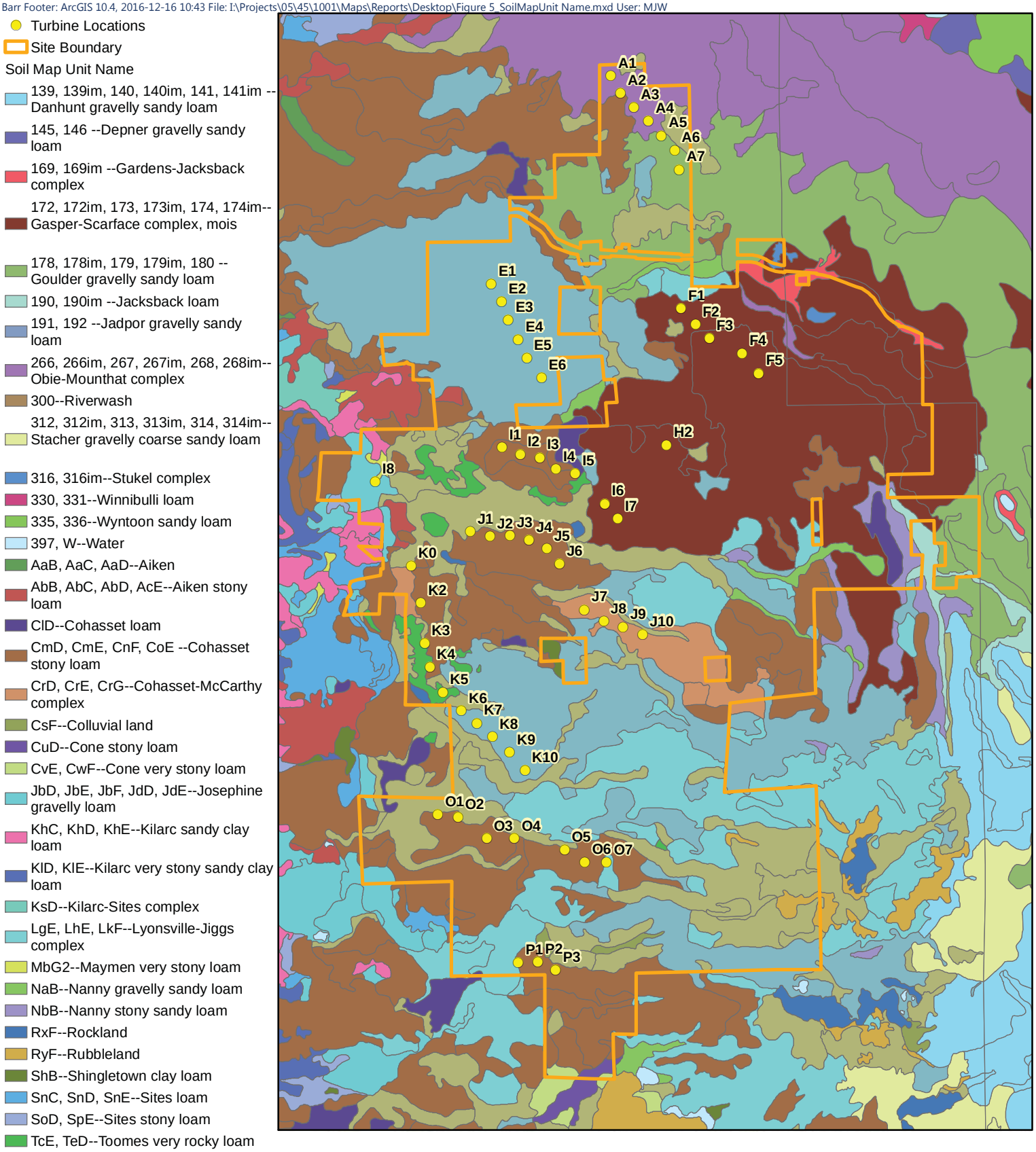
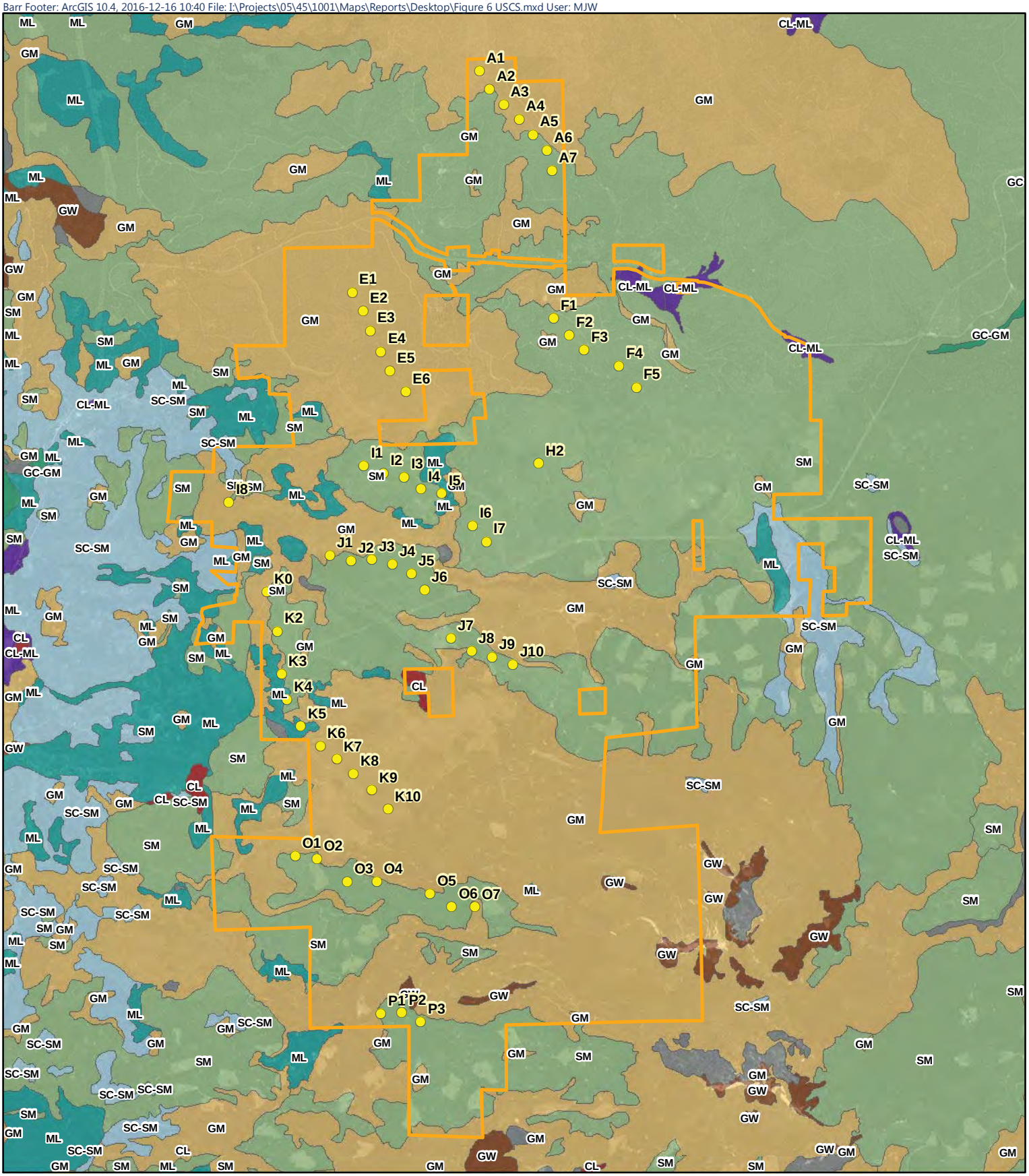


Figure 5
Soil Map Unit Name
McCloud Project
Avangrid Renewables
Shasta County, California



- Turbine Locations
- Site Boundary

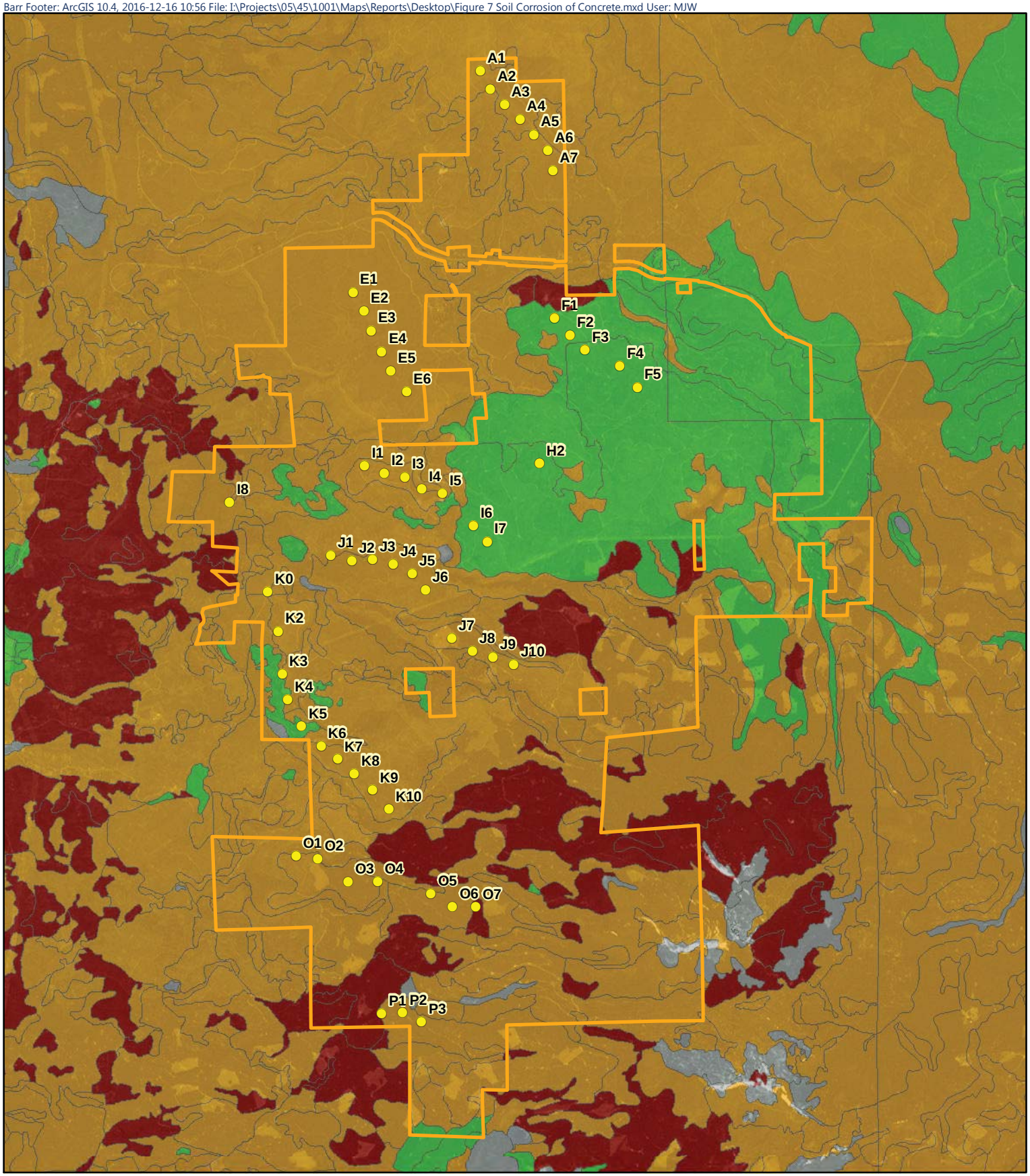
Unified Soil Classification System

- No Data
- CL: Clay of low plasticity
- CL-ML: Clay/silt of low plasticity
- GC: Clayey gravel
- GC-GM: Clayey/silty gravel
- GM: Silty gravel
- GW: Well-graded gravel, fine to coarse gravel
- ML: Silt
- SC-SM: Silty/clayey sand
- SM: Silty sand

0 1,875 3,750 7,500
Feet

Source: NRCS SSURGO Soils

Figure 6
Unified Soil Classification System
McCloud Project
Avangrid Renewables
Shasta County, California



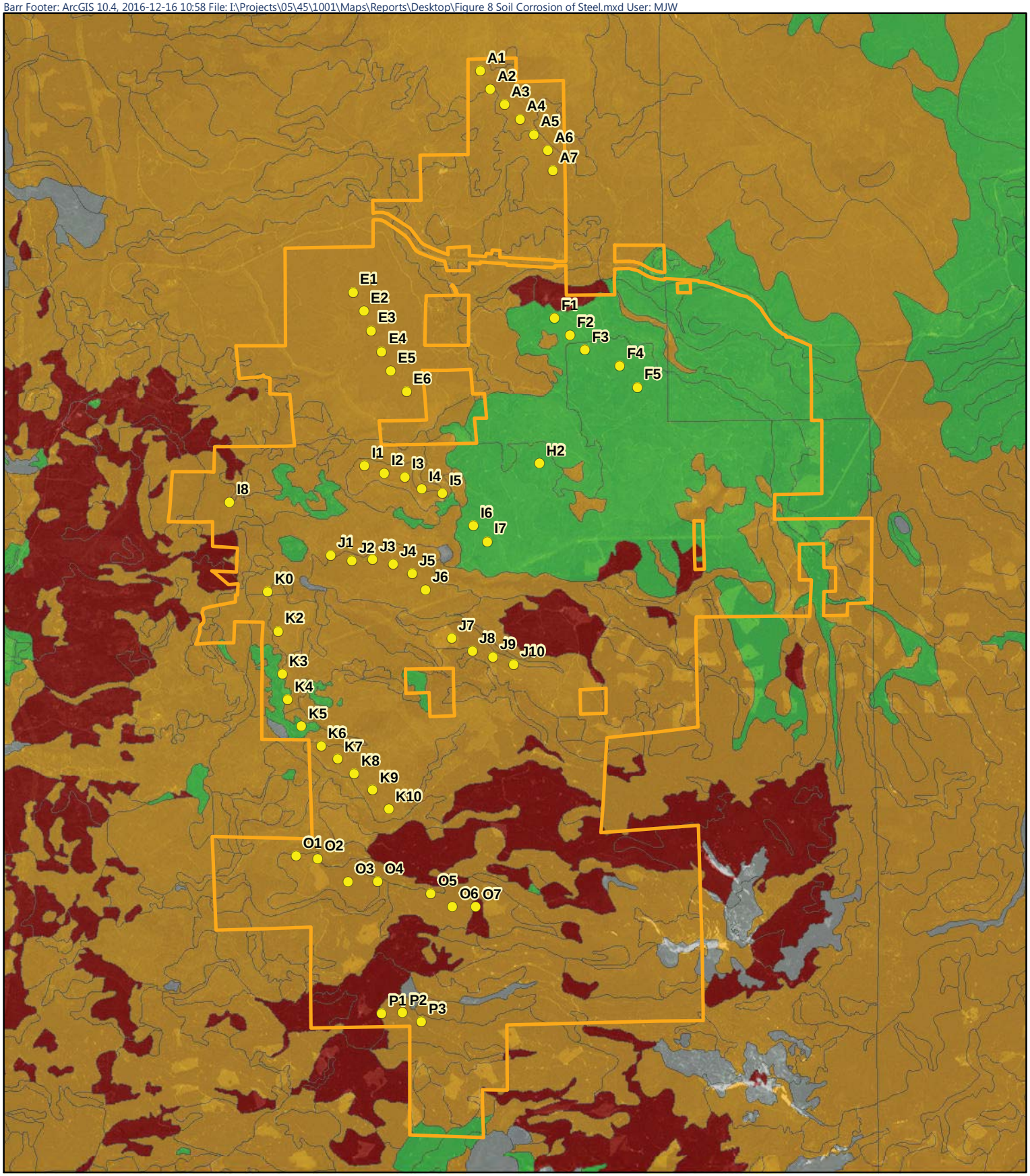
Turbine Locations
Site Boundary

Corrosion of Concrete
- No Data
- High
- Moderate
- Low

0 1,875 3,750 7,500
Feet

Source: NRCS SSURGO Soils

Figure 7
Soil Corrosion of Concrete
McCloud Project
Avangrid Renewables
Shasta County, California

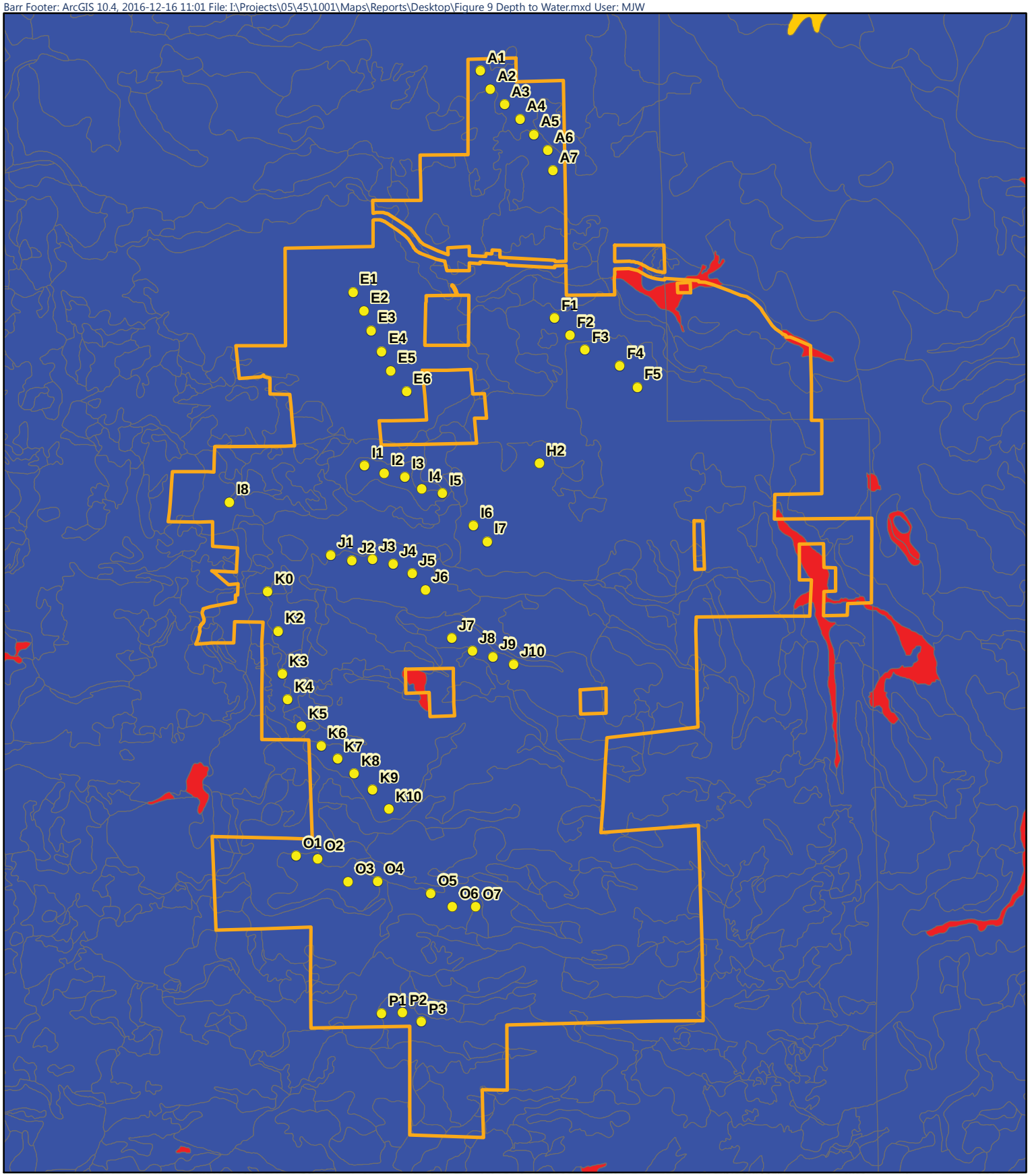


Turbine Locations
Site Boundary
Corrosion of Concrete
No Data
High
Moderate
Low

0 1,875 3,750 7,500
Feet

Source: NRCS SSURGO Soils

Figure 8
Soil Corrosion of Steel
McCloud Project
Avangrid Renewables
Shasta County, California



Turbine Locations
Site Boundary

Depth to Water

- 0 - 50 cm
- 50 - 100 cm
- 100 - 150 cm
- 150 - 200 cm
- 200+ cm

0 1,875 3,750 7,500
Feet

Figure 9
Depth to Water
McCloud Project
Avangrid Renewables
Shasta County, California

Source: NRCS SSURGO Soils

Earthquake Epicenters

Fault Line*

Quaternary Faults**

<15,000 years

<130,000 years

<1,600,000 years

Shaking (%g)

PGA (Peak Ground Acceleration)

< 10%

10 - 20%

20 - 30%

30 - 40%

40 - 50%

50 - 60%

60 - 70%

70 - 80%

>80%

The unit "g" is acceleration of gravity.

Seismic Shaking Hazard Data Source: Based on the USGS/CGS Probabilistic Seismic Hazards Assessment (PSHA) Model, 2002 (revised April 2003). (http://www.consrv.ca.gov/cgs/rghm/psha/Pages/index.aspx)

*U.S. Geological Survey, California Geological Survey
**U.S. Geological Survey 2006, Quaternary fault and fold database for the United States

Miles

2 0 2

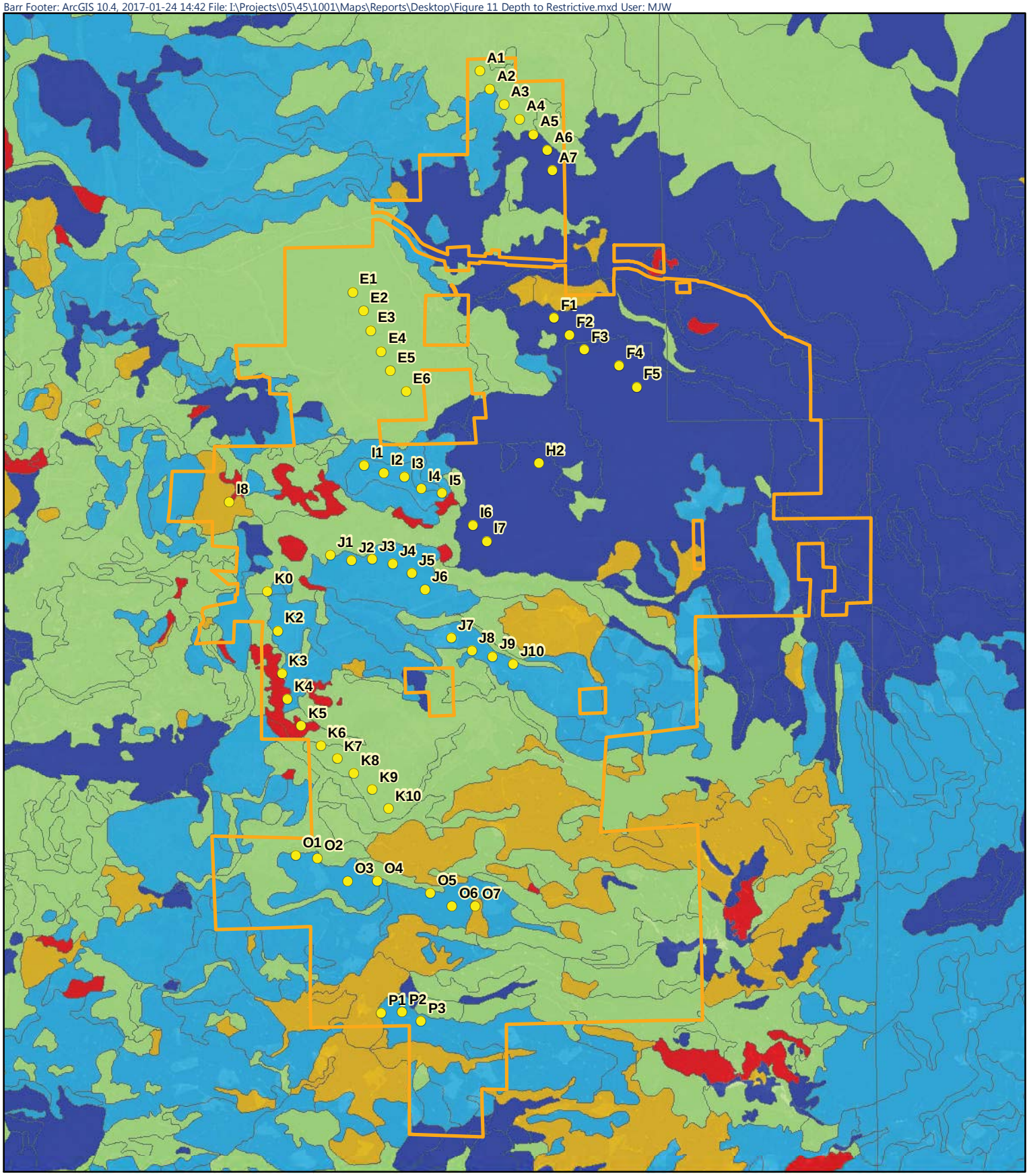
Kilometers

4 0 4

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 10

PROBABILISTIC SEISMIC HAZARD MAP
McCloud Project
Avangrid Renewables
Shasta County, California



Turbine Locations
Site Boundary
Depth to Restrictive Layer
0-50
50-100
100-150
150-200
>200

0 1,875 3,750 7,500
Feet

Figure 11
Depth to Restrictive Layer
McCloud Project
Avangrid Renewables
Shasta County, California

Source: NRCS SSURGO Soils

Barr Footer: ArcGIS 10.4, 2017-01-24 14:40 File: I:\Projects\05\45\1001\Maps\Reports\Desktop\Figure 12 Aerial Image of Proposed Turbine I5 .mxd User: MJW

Turbine Locations
Site Boundary

0 115 230 460
Feet

Figure 12
Aerial Image of Proposed
Turbine I5
McCloud Project
Avangrid Renewables
Shasta County, California

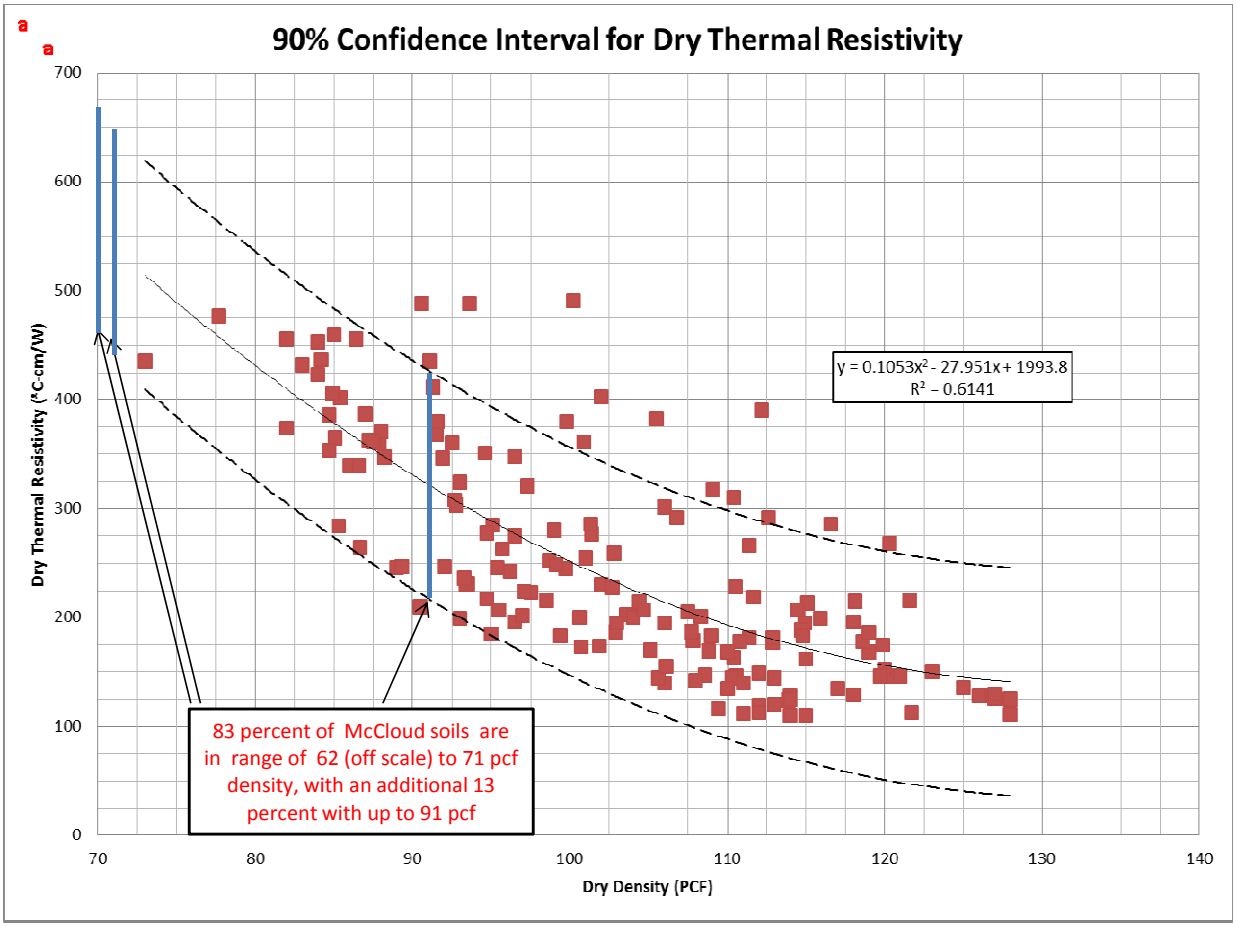


Figure 13
90% Confidence Interval for Dry Thermal Resistivity

Appendix B FOUNTAIN WIND PROJECT REFERRAL DISTRIBUTION LIST

Use Permit 16-007

Fountain Wind Project

Referral Distribution List

Revised January 24, 2018

All Persons and Agencies to receive a letter which refers them to a link to the project information on the Planning Division website.

R = Responsible Agency, C = Community Organization, X = Other

County Files (2)*

Board of Supervisors

X Board of Supervisors Office

X David Kehoe, District 1

X Leonard Moty, District 2

X Mary Rickert, District 3

X Steve Morgan, District 4

X Les Baugh, District 5

Planning Commission

X Jim Chapin

X Tim MacLean

X Steven Kerns

X Roy Ramsey

X Patrick Wallner

Shasta County

X Larry Lees
County Administrative Officer
Shasta County

X Clerk of the Board
Shasta County

X Rubin Cruse
County Counsel
Shasta County

X Dan Little
Shasta Regional Transportation Agency
1255 East Street Suite 202
Redding CA 96001

X Andrew Deckert
Shasta County
Department of Public Health

R Pat Minturn
Shasta County
Department of Public Works

X Shasta County Assessor's Office

R John Waldrop
Shasta County
Department of Resource Management
Air Quality Management Division

R Carla Serio
Shasta County
Department of Resource Management
Environmental Health Division

R Richard Simon
Director
Shasta County
Department of Resource Management

R Kim Hunter
Planning Division Manager
Shasta County
Department of Resource Management

R Dale Fletcher
Building Division Manager
Shasta County
Department of Resource Management
Building Division

X Shasta County
Department of Resource Management
Planning Division
Permits Counter

R Jimmy Zanotelli
Shasta County
Fire Department

X Shasta County
Sheriff's Office
Tom Bosenko

Library

X Shasta County Library
1100 Parkview Avenue
Redding, CA 96001

X Shasta County Library
Anderson Branch
3200 West Center
Anderson, CA 96007

Shasta County Cities

X City of Redding
Development Services Department
Planning Division
777 Cypress Avenue
Redding, CA 96001

X City of Redding - Airports

X City of Anderson
Planning Department
1887 Howard Street
Anderson, CA 96007

X City of Shasta Lake
Planning Department
PO Box 777
Shasta Lake CA 96019

Bordering Counties

X County of Lassen
Community Development Department
707 Nevada Street
Susanville, CA 96103

X County of Modoc
Planning Department
202 West Fourth Street
Alturas, CA 96101

X County of Plumas
Planning Department
555 Main Street
Quincy, CA 95971

X County of Siskiyou
Planning Department
806 South Main Street
Yreka, CA 96097

X County of Tehama
Planning Department
444 Oak Street, Room 1
Red Bluff, CA 96080

X County of Trinity
Planning Department
P.O. Box 2819
Weaverville, CA 96093-2819

Schools

X County Office of Education

X Fall River Joint

X Mountain Union Elementary

X Oak Run Elementary

X Shasta Union High School District
1313 Yuba Street
Redding, CA 96001

X Shasta College
PO Box 496006
Redding, CA 96049-6006

Local Agencies

X Burney Fire Protection District

X Mayers Memorial Hospital

X Shasta Mosquito and Vector Control
19200 Latona Road
Anderson CA 96007

X Western Shasta Resource Conservation District
6270 Parallel Road
Anderson, CA 96007-4833

X Fall River Resource Conservation District

X President
Cow Creek Watershed Management Group
P.O. Box 71
Whitmore, CA 96096

X Economic Development Corporation of Shasta County
410 Hemsted Drive #220
Redding, CA 96002

X Shasta Regional Transportation Agency

State Agencies

R State Clearinghouse
PO Box 3044
Sacramento CA 95812-3044

X Department of Conservation
801 K Street, MS 18-01
Sacramento, CA 95814

R California Department of Forestry and Fire Protection

X California Highway Patrol
Redding Office
25603 Cascade Boulevard
Redding, CA 96003

X California Historical Resources Information System
Northeast Information Center
123 West 6th Street, Suite 100
Chico, CA 95928

R California Department of Fish & Wildlife
601 Locust Street
Redding CA 96001

R California Regional Water Quality Control Board
364 Knollcrest Drive STE 205
Redding CA 96002

R Marci Gonzalez
Caltrans District 2
Local Development Review MS6
1657 Riverside Drive
Redding, CA 96001-0536

X Caltrans Division of Aeronautics

X California Emergency Management Agency
3650 Schriever Ave.
Mather, CA 95655

X California Energy Commission

R California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Federal Agencies

R Redding Office
U.S. Army Corps of Engineers
Sacramento District
310 Hemsted Drive STE 310
Redding CA 96002

R U.S. Fish and Wildlife Service
2800 Cottage Way, W2605
Sacramento, CA 95825

R Federal Aviation Administration

X Bureau of Land Management - Redding

X U.S. Navy – (military training routes)

X USFS – Lassen National Forest

X Lassen National Park

Native American Groups

X Pit River Tribe

X Pit River Tribe: Madesi / Atsuge / Ajumawi / Aporige

X Pit River Tribe of Historical Preservation

X Roaring Creek Indian Rancheria

X Barbara Murphy, Chair
Redding Rancheria
2000 Rancheria Road
Redding CA 96001

X Caleen Sisk-Franco, Tribal Chair
Winnemem Wintu Tribe
14840 Bear Mountain Road
Redding, CA 96003

X Kelli Hayward
Wintu Tribe of Northern California
PO Box 995
Shasta Lake, CA 96019

X Wintu Educational and Cultural Council
12138 Lake Boulevard
Redding, CA 96003

X Wintu Tribe and Cultural Council

X Wintu Tribe and Toyon Wintu Center

X United Tribe of Northern California, Inc.
20059 Parocast Road
Redding, CA 96003

X Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

X Greenville Indian Rancheria
P.O. Box 279
410 Main Street
Greenville, CA 95947

X Nor Rel Muk Nation

X Quartz Valley Indian Community

X Shasta Nation

News Media

X KQMS Newstalk 1400
3660 Alta Mesa Drive
Redding CA 96002

X Redding Record Searchlight
1101 Twin View Blvd
Redding CA 96003

X KRCR TV News Channel 7
755 Auditorium Drive
Redding CA 96001

X East Valley Times
P.O. Box 100
Palo Cedro, CA 96073

X Intermountain News

X Mountain Echo

Private Utilities

X Jason Thomas
Pacific Gas and Electric Company
3600 Meadow View Road
Redding, CA 96002

X Frontier Communications
9324 W. Stockton Blvd.
Elk Grove, CA 95758

Community Organizations

C Hill Country Community Clinic
29632 Highway 299 E
Round Mountain, CA 96084

C Audubon Society – Wintu Chapter

C California Native Plant Society
Shasta Chapter
P. O. Box 990194
Redding, CA 96099-0194

C Sierra Club – Shasta Chapter

C Moose Recreational Camp
P.O. Box 491587
Redding, CA 96049-1587 (added 1/24/18)

Applicant

X Pacific Wind Development, LLC
1125 NW Couch Street, Suite 700
Portland, OR 97209

X Oxbow Timber I, LLC
98 Mill Street
Weed, CA 96094

Appendix C AGENCY CONSULTATION AND NOTIFICATION

Prior to an environmental recommendation, referrals for this project were sent to agencies thought to have responsible agency or reviewing agency authority. The responses to those referrals (attached), where appropriate, have been incorporated into this document and will be considered as part of the record of decision for the environmental review associated with Project Use Permit 16-007. Copies of all referral comments may be reviewed through the Shasta County Planning Division. To date, referral comments have been received from the following State agencies or any other agencies which have identified CEQA concerns:

Agency	Commenter	Comment Date
Burney Fire Protection District	Monte Keady, Fire Chief	January 15, 2018
California Department of Fish and Wildlife	Curt Babcock, Habitat Conservation Program Manager	March 2, 2018
California Department of Fish and Wildlife	Kristin Hubbard, Environmental Scientist	March 7, 2018
California Department of Transportation	Marcelino "Marci" Gonzalez, Local Development Review & Regional Transportation Planner	January 31, 2018
Central Valley Regional Water Quality Control Board	Dannas J. Berchtold, Engineering Associate Storm Water & Water Quality Certification Unit	February 5, 2018
Frontier Communications	Chuck Wadowski, Engineer Senior Network Design	January 11, 2018
Pit River Tribe	Brandy Mcdaniels, Madesi Band Cultural Representative for The Pit River Tribe	February 10, 2018
Shasta County Assessor / Recorder		January 16, 2018
Shasta County Air Quality Management District	John Waldrop	January 16, 2018
Shasta County Fire Department	Jimmy Zanotelli, Fire Marshall	February 1, 2018
Shasta County Office of the Sheriff	Lt. Tyler Thompson, Burney Patrol Station	February 8, 2018
Shasta Mosquito and Vector Control District	Darcy Buckalew, Administrative Office Manager	January 12, 2018
Wintu Audubon Society	Bruce Webb And Janet Wall, Co-chairs Conservation	February 14, 2018

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
PLANNING DIVISION
1855 Placer Street, Suite 103, Redding, CA 96001
Date Sent: January 10, 2018

TO INTERESTED/AFFECTED AGENCIES:
Shasta County, acting as the lead agency under the California Environmental Quality Act (CEQA), has determined that an Initial Study will be required for the project described below. This is a request for informal consultation with you or your agency, as required by CEQA Guidelines Section 15063 (g), prior to the preparation of the Initial Study. Please review and comment on the project, and return this form (with comments attached if more space is needed) prior to: **February 9, 2018.**

* *

PROJECT DATA

PROJECT: Use Permit 16-007 (Fountain Wind project)

APPLICANT: Pacific Wind Development, LLC, 1125 Couch Street, Suite 700, Portland, OR 97209

PROJECT DESCRIPTION: The applicant proposes to construct and operate the Fountain Wind Project (Project) which would consist of up to 100 wind turbines and associated infrastructures, with a generating capacity of up to approximately 347 megawatts. The proposed Project would be on 94 Assessor parcels covering about 38,000 acres. In addition to the wind turbines including associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components. For more project information please refer to the project narrative and figures on the Planning Division website:

https://www.co.shasta.ca.us/index/drm_index/planning_index/eirs/fountain-wind-project/Project-Description

LOCATION: The project site is located on the west side of the Cascade Range in Shasta County on portions of about 38,000 acres owned by Oxbow Timber I, LLC, located both north and south of State Highway 299 East, to the east of the communities of Montgomery Creek and Round Mountain, and west of Hatchet Mountain Pass. The project site is about 6 miles west of the community of Burney, and about 35 miles east of the City of Redding. For more precise location information, please refer to the project narrative and figures on our website above. Also see Vicinity Map on following page.

* *

AGENCY RESPONSE

☐ No Comment: Note: Your agency's approval will be assumed if no response is received by the above date.

☑ We have reviewed the subject proposal and offer the following comment(s): See attached

Signed: ______________________________

For (Agency): Burney Fire Protection Dist

* *

Any questions may be directed to Bill Walker, Senior Planner at (530) 225-5532, or bwalker@co.shasta.ca.us

Sincerely,

W. M. Walker

Bill Walker, AICP, Senior Planner
Planning Division
Department of Resource Management

BURNEY FIRE PROTECTION DISTRICT

Established 1939

January 15, 2018

Shasta County Department of Resource Management
Planning Division
1855 Placer Street, Suite 103
Redding, CA 96001

RE: Fountain Wind Project

The following are the comments on the Project Use Permit 16-007, The Fountain Wind Project proposed by the applicant Pacific Wind Development, LLC operating out of Portland, Oregon.

1. Burney Fire District has no specific jurisdiction for fire suppression or fire prevention activities within the area designated, for the Fountain Wind Project. As such, these comments do not address any specific requests regarding these issues. However, the Burney Fire District does stand willing to provide these services as much as is lawful and prudent under the law by contract with Pacific Wind Development, LLC.

2. The Fountain Wind Project is within the Burney Fire District Ambulance service area and does have first response obligation for all EMS, medical and rescue operations within the proposed project. Burney Ambulance personnel will provide Advanced Life Support and Basic Life Support to the project. Burney Ambulance personnel will gain all weather access to the project site through the use of a 4x4 ambulance, a John Deere Gator [side-by-side] with patient hauling capabilities, or a Ski Doo rescue snowmobile. Burney Fire District would ask Pacific Wind Development to ensure the operator of the Fountain Wind Project to assist Burney Fire District in maintaining and increasing these vehicles in the following manner.
    a. Current aging ambulance fleet is in need of a replacement vehicle ($125,000)
    b. Current John Deere Gator is in need of an upgraded transport trailer ($3000)
    c. Current Ski Doo snowmobile is in need of a patient hauling towable rescue sled. ($5000)

Burney Fire District leadership is excited about the growth potential of the energy industry in Central Shasta County and will do all to support their operations when asked.

Respectfully submitted,

Monte Keady
Fire Chief

37072 MAIN STREET BURNEY CALIFORNIA 96013
Phone (530) 335-2212 * * * Fax (530) 335-2235

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Region 1 – Northern
601 Locust Street
Redding, CA 96001
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

March 2, 2018

Bill Walker
Planning Division
Shasta County Department of Resource Management
1855 Placer Street, Suite 103
Redding, CA 96001

Subject: Informal Consultation Request for Use Permit 16-007, Fountain Wind Project, Shasta County

Dear Mr. Walker,

The California Department of Fish and Wildlife (Department) has reviewed the Use Permit and associated documents for the Fountain Wind Project (Project), Use Permit 16-007. The Department offers the following comments and recommendations.

As a Trustee Agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants and their habitat. As a Responsible Agency, the Department administers the California Endangered Species Act (CESA) and other provisions of the Fish and Game Code (FGC) that conserve the State's fish and wildlife public trust resources. The Department offers the following comments and recommendations on the Project in our role as the State's Trustee Agency for fish and wildlife resources, and as a Responsible Agency under the California Environmental Quality Act (CEQA), California Public Resources Code section 21000 et seq.

Project Description

The informal consultation request is for a Use Permit for the construction of the Fountain Wind Project (Project). The Project proposes a 347 megawatt wind energy development consisting of up to 100 wind turbines, associated infrastructure, and ancillary facilities located in the vicinity of the communities of Burney, Moose Camp, Hillcrest, Wengler, Montgomery Creek, and Round Mountain, in Shasta County, CA. Project infrastructure and ancillary facilities include 17 construction laydown areas, two possible temporary batch plants, temporary construction and equipment area, construction trailer area, and associated parking, 87 miles of existing access roads that may need to be upgraded and up to an additional 21 miles of new access roads, up to 56 miles of underground and up to 16 miles of overhead collector lines, an operations and maintenance facility, storage sheds, an onsite substation and switching station, and two permanent meteorological towers.

Comments and Recommendations

The following comments are intended to assist the Lead Agency in making informed decisions early in the Project development and environmental review process. The Department understands that further Project information and environmental documents are forthcoming and will be submitting additional comments as data collection proceeds and environmental documents develop. Because of the lack of data provided to the Department regarding the exact Project boundary, the Department is being particularly conservative and cautious in our review and recommendations.

Biological Resources Work Plan

The Department provided a brief synopsis of concerns regarding the Biological Resources Work Plan presented at the June 2017 consultation meeting in a letter addressed to you dated July 25, 2017 (attached), sections of which will be expanded on below.

The Biological Resource Work Plan (Work Plan) outlines the baseline biological studies to be conducted for the development of the Project. The Work Plan relies on multiple State and federal guidance documents to determine appropriate preconstruction biological studies and protocols. These documents include the 2007 California Energy Commission/Department's *California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development* (CEC/CDFG Guidelines), the 2012 United States Fish and Wildlife Service (USFWS) *Land-Based Wind Energy Guidelines* (WEG), and the 2013 USFWS *Eagle Conservation Plan Guidance*. In general, the Department defers to the approach most likely to result in comprehensive data collection to inform the CEQA and permitting processes, or the best available science regarding survey and/or monitoring techniques. We note that some of the guidance in current use for wind energy development is over 10 years old. In certain cases, this guidance may be superseded by more current approaches, but should still be considered a minimum standard to produce adequate pre-development studies and surveys.

The Department requests an update to the Work Plan to address comments here and in our July 25, 2017 letter. Specific information should be included regarding survey protocols to be utilized, including datasheets, timing of surveys, and a description of all surveys to be conducted as part of the proposed Site Characterization Study. If survey protocols suggested below are altered, the Work Plan should discuss reasons for this deviation.

All necessary biological surveys should be conducted in advance of the draft EIR circulation, and should not be deferred until after Project approval. All survey reports should be sent to the Department at Attn: CEQA, 601 Locust Street, Redding, CA, 96001.

Special-Status Species and Habitat Surveys

In addition to the surveys proposed for bats and avian species, the Department recommends the completion of a comprehensive baseline survey including a complete assessment of the flora and fauna within and adjacent to the Project area, with particular emphasis upon identifying special-status species including rare, threatened and endangered species, Fully Protected species, and Species of Special Concern. This assessment should also address locally unique species, rare natural communities, and wetlands, and must be conducted at the appropriate time of year to identify species of concern. Seasonal variations in use of the Project site should also be addressed.

The assessment area for the Project should be large enough to encompass areas potentially subject to direct impacts and areas in which reasonably foreseeable indirect Project impacts will occur. Examples of indirect impact assessment areas include any area in which sensitive species or habitat would be impacted by noise from construction or ongoing maintenance activities, noise and vibrations from blasting, fugitive dust, Project lighting, habitat fragmentation, downstream impacts to waters of the state, etc. Both the Project footprint and the assessment area (if different) should be clearly defined and mapped. The areas depicted in Figure 17 of the Use Permit Application may not provide adequate survey coverage.

CESA-Listed Species

Take of species of plants or animals listed as endangered or threatened under CESA is unlawful unless authorized by the Department. However, a CESA 2081(b) Incidental Take Permit (ITP) may authorize incidental take during Project construction or over the life of the Project. The draft EIR must state whether the Project could result in any amount of incidental take of any CESA-listed species. Early consultation for incidental take permitting is encouraged, as significant modification to the Project's description and/or mitigation measures may be required in order to obtain a CESA Permit.

The Department's issuance of a CESA Permit for a project that is subject to CEQA will require CEQA compliance actions by the Department as a Responsible Agency. The Department as a Responsible Agency under CEQA will consider the Lead Agency's draft EIR for the Project. The Department may require additional mitigation measures for the issuance of a CESA Permit unless the Project CEQA document addresses all Project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA Permit.

The Department recommends the future draft EIR address all potential impacts to CESA-listed species, a range of alternatives, and feasible avoidance and mitigation measures to reduce impacts to less than significant.

Candidate Amphibian Species - Foothill Yellow-legged Frog and Cascades Frog

Foothill yellow-legged frog (*Rana boylii*) and Cascades frog (*R. cascadae*) habitat occurs in the Project area. On June 21, 2017, the California Fish and Game Commission (Commission) accepted the petition to list the foothill yellow-legged frog as a threatened species and will be initiating the preparation of a Status Review to determine whether listing as threatened is warranted. Based on the findings published July 7, 2017, the foothill yellow-legged frog is considered a candidate species as defined by FGC section 2068.

On October 11, 2017, the Commission accepted the petition to list Cascades frog as a threatened or endangered species and will be initiating the preparation of a Status Review to determine whether listing as a threatened or endangered species is warranted. Based on findings published October 17, 2017, the Cascades frog is considered a candidate species as defined by FGC section 2068.

During the Status Review period, FGC section 2085 confers full legal protection of an endangered or threatened species on a candidate species. This includes the general prohibition on "take" of the species, as defined in FGC section 86 as to "hunt, pursue, catch, capture or kill" or to attempt to engage in any of these activities.

Mainly regarded as a stream obligate, few studies have focused on upland habitat use by foothill yellow-legged frog; however, it is likely that these frogs utilize a wide range of watershed features, including terrestrial habitat, depending on the season. One study in Tehama County found frogs rarely go beyond 12 m from the channel during any time of the year (Bourque 2008). However, during the same study, Bourque observed a female move up a dry tributary and over a ridge to an adjacent watershed, a distance of over 7 km from her original location, although much of this was in wetted channels. Nussbaum et al. (1983) reported finding frogs 50 m away from water under debris. Cook (2012) described frequent observations of foothill yellow-legged frogs in terrestrial locations far (16 m to 331 m, average distance of 71.3 m) from natal streams and in urban settings, near Ukiah, Mendocino County.

Cascades frogs typically utilize lentic waterbodies for breeding, however, egg masses have also been observed in slow flowing streams, with adults and juveniles utilizing a variety of aquatic habitats during different life history stages. Adult Cascades frogs have been documented as undergoing extensive overland movements. In a study conducted in the Trinity Alps, radio tracked individuals were documented as completing seasonal migrations of over 1600 meters (Garwood 2009). Two radio tracked frogs were observed navigating through steep terrestrial terrain (Garwood and Welsh, 2007). Because this species is known to undergo long distance seasonal migrations, surveys of adjacent critical habitat must occur in order to gain an understanding of migratory pathways within the Project site and to ensure the preservation of connectivity between populations. Dispersing animals are vital to maintaining the genetic flow and population viability of this species.

The Department recommends the completion of a habitat assessment and subsequent focused surveys for these species in all areas of the Project that may directly or indirectly impact species habitat as discussed above, including aquatic and terrestrial habitat, migration routes, and critical Cascades frog habitat adjacent to the Project site. Prior to the commencement of these surveys, a Survey Plan must be developed and submitted to the Department for review. The Survey Plan should include what life-stage(s) will be surveyed for, survey method(s), timing of surveys, and location of surveys. The Survey Plan should provide justification for timing and methodology or survey design (e.g., watershed characteristics, regional snow pack, timing and rate of spring runoff, day length, average ambient air and water temperatures, local and seasonal conditions). For sites with suitable breeding habitat, two consecutive seasons of negative egg mass/larval surveys are recommended to support a negative finding.

If there is potential take of foothill-yellow legged frog or Cascades frog may be potential due to direct or indirect impacts related to Project construction, such as through direct removal, filling, hydrological interruption, sedimentation, impaired water quality, or other means, the applicant will need to apply for an ITP in order to comply with CESA, as discussed above. The Department may issue an ITP authorizing the take of a candidate species when it is incidental to an otherwise lawful activity, the impacts of the take are minimized and fully mitigated, the applicant ensures there is adequate funding to implement any required measures, and take is not likely to jeopardize the continued existence of the species. If, at the time of Project implementation, either species is not listed under CESA or is no longer a candidate, CESA authorization will not be required. However, since both species are California Species of Special Concern, impacts to either one may still be significant under CEQA.

Willow Flycatcher Protocol Surveys

The Department is aware of known breeding occurrences of willow flycatcher (*Empidonax traillii*, State Endangered) on or near the Project site and potential habitat may occur on the Project site based on the Department's willow flycatcher habitat model. Therefore, a qualified biologist proficient at delineating willow flycatcher habitat and conducting surveys should determine if suitable habitat occurs within the Project site and conduct surveys to determine site occupancy. Surveys should be conducted using the recommended protocol: A Willow Flycatcher Survey Protocol for California (Bombay et al. 2003) available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84019&inline.

Northern Spotted Owl Protocol Surveys

Northern spotted owl (*Strix occidentalis caurina*, State Threatened, federally Threatened) critical habitat designated by the USFWS and northern spotted owl territories are located in close proximity to the Project site. The Department recommends the completion of surveys following the revised January 9, 2012, U.S.

Fish and Wildlife Service *Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owls* and consultation with USFWS staff regarding potential impacts to this species.

Great gray owl

Great gray owl (*Strix nebulosi*, State Endangered) habitat is modeled within and near the Project site; therefore, a habitat assessment and surveys for this species should be conducted to determine presence within or near the Project site.

Gray Wolf

Since December 2011, at least two packs of gray wolves (*Canis lupus*) and three separate individual wolves have been detected in California. Key wolf use areas to date have included western Lassen and eastern Siskiyou counties, although wolves have also been known to utilize parts of Modoc, Plumas, Shasta, and Tehama counties. Wolves historically occupied diverse habitats in North America, including forests, grasslands, deserts and tundra. Their primary habitat requirements are the presence of adequate water and prey, mainly elk and deer. Wolves will also consume other mammals, birds and reptiles and scavenge carrion. Gray wolves were extirpated from California in the 1920s and little is known about the historical abundance and distribution of wolves in California. As human population and human development have increased dramatically since wolves last occurred here, the Department remains uncertain about where and how many wolves will establish as they continue to naturally recolonize the state. The gray wolf is listed as an endangered species pursuant to both the federal Endangered Species Act (Act) and the CESA.

No localized wolf activity is currently known from within or near the Project Area. If gray wolf activity is detected during Project wildlife surveys, or if, prior to or during construction activities, the current Department wolf activity map[1] identifies localized wolf activity within or adjacent to the Project Area, the Project proponent should consult with the Department. The Department will determine if Project activities pose any potential impacts to gray wolves, particularly with respect to potential modification or disruption of key pup rearing areas such as dens and rendezvous sites. Typical mitigation measures the Department might recommend to minimize any such impacts include limited operation periods, disturbance buffers, reduced speed and signage on haul roads, modification of haul routes to avoid key areas, and additional biological monitoring.

[1] https://www.wildlife.ca.gov/conservation/mammals/gray-wolf

State Listed and Fully Protected Avian Species

Bald eagle (*Haliaeetus leucocephalus,* State Endangered) and greater sandhill crane (*Grus canadensis tabida,* State Threatened) are both State listed pursuant to CESA and are Fully Protected under FGC section 3511. Both of these species are documented in close proximity or on the Project area. Because these species are Fully Protected, the Department is not authorized to issue permits for their incidental take as discussed below.

Fully Protected Species

The Department designates certain animals as Fully Protected in FGC sections 3511, 4700, 5050, and 5515. Fully Protected animals may not be taken or possessed at any time and the Department is not authorized to issue permits or licenses for their incidental take[2]. Fully Protected animals should be considered during the environmental review process and all Project-related should must be avoided and impacts be mitigated to a less than significant level.

Bald eagle, golden eagle (*Aquila chrysaetos*), greater sandhill crane, and American peregrine falcon (*Falco peregrinus anatum*) are all Fully Protected species pursuant to FGC. All of these species have the potential to be impacted by this Project. This list should not be considered comprehensive, as stated in the Department's July 2017 letter, additional research is necessary, including database queries, to determine the full list of species with potential to occur on the Project site.

Species of Special Concern

Species of Special Concern status applies to animals generally not listed under the federal Act or CESA, but which nonetheless are declining at a rate that could result in listing, or historically occurred in low numbers and known threats to their persistence currently exist. Species of Special Concern (SSC) should be considered during the environmental review process (see CEQA Guidelines, § 15380 and CEQA Guidelines Appendix G (IV)(a)). Section 15380 of the CEQA Guidelines clearly indicates that SSC should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

Sections 15063 and 15065 of the CEQA Guidelines, which address how an impact is identified as significant, are particularly relevant to SSC. Project-level impacts to listed (rare, threatened, or endangered) species are generally considered significant thus requiring lead agencies to prepare an EIR to fully analyze and evaluate the impacts. In assigning "impact significance" to populations of non-listed species, analysts usually consider factors such as population-level effects, proportion of the taxon's range affected by a project, regional effects, and impacts to habitat features.

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[2] Scientific research, take authorized under an approved NCCP, and certain recovery actions may be allowed under some circumstances; contact the Department for more information.

The Project has the potential to adversely impact many SSC, including the following: Western pond turtle (*Emys marmorata*), southern long-toed salamander (*Ambystoma macrodactylum sigillatum*), Pacific tailed frog (*Ascaphus truei*), Northern goshawk (*Accipiter gentiles*), California spotted owl (*Strix occidentalis occidentalis*), yellow warbler (*Setophaga petechia*), olive-sided flycatcher (*Contopus cooperi*), American badger (*Taxidea taxus*), Pacific fisher (*Pekania pennanti*), and California wolverine (*Gulo gulo*). Although the Project is outside of the current known range of California wolverine, it is within historic range; therefore, the Department requests immediate notification if California wolverine is observed incidentally on the Project site. This list should not be considered comprehensive, and as stated in the Department's July 2017 letter, additional research is necessary, including database queries, to determine the full list of species with potential to occur on the Project site. Additional surveys will be necessary to identify impacts to SSC species. For Northern goshawk, the Department recommends that surveys follow the protocol discussed below.

Additional Department Watch List species with potential to occur on or near the Project site, or with potential to be impacted by Project activities include: Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), and osprey (*Pandion haliaetus*).

Northern Goshawk Protocol Surveys

Many Northern goshawk (California SSC) occurrences are documented on and near the Project site. For this reason, the Department requests the completion of focused protocol-level Northern goshawk surveys. As recommended in the CEC/CDFG Guidelines, these surveys should follow existing survey protocols for special-status raptors. The Department recommends utilizing the USFWS 2006 protocol outlined in the *Northern Goshawk Inventory and Monitoring Technical Guide*, which can be found at: https://www.fs.fed.us/biology/wildecology/docs/GoshawkTechGuideJuly06.pdf. As with other recommended surveys, this survey should be added to the Work Plan, along with detailed information regarding how the survey will follow the protocol and information on survey timing and locations.

Avian Point Count Surveys

The Use Permit Application and Work Plan propose to conduct avian point count surveys to document small bird use of the Project area, and state that this survey is consistent with the CEC/CDFG Guidelines. Based on the CEC/CDFG Guidelines, "*small bird use counts are useful for assessing displacement effects and habitat losses to resident songbirds and other small birds*" and are intended to provide a density estimate of resident breeding songbirds. This survey is not intended to be utilized in lieu of or supersede Bird Use Counts (BUC), which should be conducted on all wind energy projects according to the CEC/CDFG Guidelines. The BUCs are intended provide baseline data on avian species richness and relative abundance and

to estimate the spatial and temporal use of the site by all birds, including large birds such as raptors, vultures, corvids, and waterfowl, as well as songbirds and other small species. BUCs should be conducted for 30 minutes once a week for at least one year, covering most daylight hours and different weather conditions. Small bird counts are intended for use in addition to the BUCs. The Department requests that a protocol for BUCs be developed and addressed in the Work Plan, which should, at a minimum, meet the requirements outlined in the CEC/CDFG Guidelines. The BUCs should be conducted in addition to the proposed small bird surveys, eagle surveys, and raptor nest searches.

The current survey proposal for small birds indicates that surveys will be conducted weekly at one quarter of the identified survey points targeting the spring and fall migration period, thus surveys at each point will occur once per month during the specified time frame. For small bird counts, the CEC/CDFG Guidelines recommends that surveys be conducted at two-week intervals, no earlier than a half-hour before and no later than four hours after sunrise. If turbine locations are known, the CEC/CDFG Guidelines recommend that small bird survey sites be established every 820 feet (250 meters) in a row between turbines. Additional survey sites may be necessary to estimate the density of special-status bird species occupying the site during the breeding season. Survey duration and frequency should be increased to meet the requirements of the CEC/CDFG Guidelines or a detailed justification should be provided if this would not occur.

The information gathered from BUCs and small bird surveys is intended to be used in the evaluation of potential impacts to avian species, to guide proper turbine siting, and refine the Project layout. This information will be an essential part of a thorough CEQA analysis that considers potentially significant impacts to resident and breeding bird habitat. The currently proposed survey effort will not adequately quantify bird use throughout the year.

Eagle/Large Bird Use Surveys

The eagle/large bird use surveys are proposed to follow the Eagle Conservation Plan Guidance (ECPG). The ECPG provides specific guidance "*to help make wind energy facilities compatible with eagle conservation and the laws and regulations that protect eagles*." The Department requests information (detailed above) as to how large bird use of the Project site will be documented in addition to the proposed surveys for eagles and raptor nests.

The Work Plan indicates that the proposed surveys are consistent with the CEC/CDFG Guidelines by conducting eagle/large bird use surveys on a weekly basis. The Work Plan also indicates that the proposed weekly surveys will be conducted "*at approximately one quarter of the points such that all points are surveyed once per month*." The CEC/CDFG Guidelines recommend conducting bird use counts (as

discussed above), which includes large birds, for 30 minutes once per week at all sampling locations for a minimum of one year.

Nocturnal Avian Surveys

The Department recommends the completion of nocturnal avian migration surveys for the Fountain Wind Project. The Work Plan states that a nocturnal avian migration survey will not be conducted at the Project site based on an analysis conducted by Tidhar et al. 2010[3], which concludes that, "*radar has been demonstrated to provide limited data relating to risk assessments,*" and based on the post-construction monitoring results from the Hatchet Ridge wind facility. The only reference the Department could find regarding Tidhar et al. 2010 was a poster presented at the National Wind Coordinating Collaborative Wildlife and Wind Research Meeting in 2010. The Department requests a copy of the peer-reviewed literature that resulted from this poster and additional information regarding locations of the studies analyzed.

A more recently published study indicates that nocturnal radar surveys, coupled with acoustic monitoring and night vision surveys, have proved to be useful tools for determining fatality risk at wind energy sites and for determining turbine placement (Johnston et al. 2013). Because Fountain Wind covers a much larger and varied topographic area than the Hatchet Ridge wind facility, the Department recommends using caution when making inferences from studies and reports produced for Hatchet Ridge. As the CEC/CDFG Guidelines recognize, "*slight topographical or habitat variations can make substantial differences in bird and bat site use and potential impacts*." Additionally, an evaluation of the nocturnal migration study conducted for the Hatchet Ridge wind facility found that thermal imaging technology, night vision, and/or acoustic monitoring would have provided better information on the types of birds detected along with information on flocking and flock size. In addition, the evaluation states that the radar surveys were "*conducted during a time of year prior to the main migration period of large, flocked waterbirds, and the data were collected entirely under typically good weather conditions*", instead of during the main migration periods or in poor visibility conditions in which large mortality events are most likely to occur. Waterbird fatalities were documented during low visibility conditions at the Hatchet Ridge wind facility during post-construction monitoring. The Department recommends utilizing multiple survey methods to conduct the nocturnal migration survey in order to document migratory pathways and minimize the risk of migratory bird collisions with turbines.

In addition to the nocturnal avian migration surveys, the Department recommends the completion of focused nocturnal owl surveys, specifically due to the potential presence of multiple special-status owl species within or near the Project site, as discussed

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[3] Tidhar, D., C. Nations, and D.P. Young. 2010. What Have We Learned from Pre-Construction Radar Studies? Poster Presented at the National Wind Coordinating Collaborative (NWCC) Wildlife and Wind Research Meeting VIII, October 19-21, 2010, Lakewood, Colorado.

above. Owl surveys should be designed to detect all species of owls potentially present within the Project site, not just the special-status owls discussed above.

Bat Monitoring

The Department recommends the placement of additional bat detectors in order to provide broader coverage of the Project area. Four detector locations in an approximately 38,000-acre (59 square mile) Project area is not adequate coverage to document bat use of the Project site. Based on site maps, the northern and southern portions of the Project area are not currently being surveyed for bat use. Migratory bat fatalities have been documented at the nearby Hatchet Ridge Wind Farm, including hoary bats (*Lasiurus cinereus*). Hoary bats comprise the largest percent of bat fatalities at wind energy facilities in North America (Arnett and Baerwald 2013), and recent research suggests that wind development may threaten the population viability of this species (Frick et al. 2017).

While standard guidance does include installing acoustic detectors on MET towers, (generally because they are the only structures tall enough to sample the airspace within the rotor swept area) it is not appropriate to limit the number of detector sites based on the limited number of MET towers. The USFWS WEG states (emphasis added): "*The number of detectors needed to achieve the desired level of precision will vary depending on the within-site variation (e.g., Arnett et al. 2006, Weller 2007, See also, Bat Conservation International website for up-to-date survey methodologies). One frequently used method is to place acoustic detectors on existing met towers*, approximately every two kilometers across the site where turbines are expected to be sited."

Kunz et al. (2007) provide a summary of available guidance:

> *"Ideally, acoustic monitoring should be conducted at the site of each proposed wind-energy facility, although practical limitations prevent coverage at all potential turbine sites. The Alberta Bat Action Team recommended a minimum number of preconstruction monitoring stations placed at each north, east, south, and west periphery of a proposed Project area, with one station in the center (Lausen et al. 2006); however, we suggest additional stations be placed in the vicinity of any variations in terrain, especially those that may potentially serve as a flyway (e.g., a forest gap). Alternatively, a systematic sample of the area of interest is recommended with a random starting point along the axis of the wind resource area. If a 3-dimensional sample survey using a vertical array of bat detectors is deployed (Fig. 13), a grid could be placed over the wind resource area with some systematic selection rule. For example, the minimum number of detectors for a site with five turbines would require deployment of 15 bat detectors. For larger Projects, more detectors would be needed."*

It will be necessary to install additional acoustic monitoring stations to adequately characterize bat activity at both above-canopy and ground level. More than two MET towers would allow installation of acoustic detectors within the appropriate height to detect bats that would fly through the rotor swept area. If additional MET tower installation is not possible, temporary towers could be installed. These temporary towers likely will not be able to achieve the ideal height for acoustic sampling, but will still provide useful data on bat species within the Project area. We recommend a minimum of one acoustic monitoring station per two kilometers on MET or temporary towers across the site as per WEG recommendations. Each station should have at least two detectors, one as close as possible to rotor height, and one near ground level (2-3 meters above ground level).

The CEC/CDFG Guidelines state: "*Monitoring for a full year is recommended because little is known about the timing of bat migratory activity in many parts of the state, and some bat species overwinter in California and can be active throughout the year.*" Additionally, the WEG recommends monitoring for a full year in areas where there is year round bat activity. Because the Project site and adjacent lands include habitat features conducive to bat activity, many of the species with potential to occupy the Project area have the potential to be active year round, and bat fatalities were documented in each season during post-construction monitoring at the Hatchet Ridge wind facility, the Department recommends the completion of bat surveys year round, instead of the proposed May 1 – November 15 timeframe.

The Work Plan does not address how potential impacts to low-intensity echo locators such as Townsend's big-eared bat (*Corynorhinus townsendii*) or pallid bat (*Antrozous pallidus*), both California SSC, will be evaluated and mitigated for. Acoustic monitoring in general, and especially at the effort level proposed, may not reliably detect these species. This is particularly important given that the proposed Project is in close proximity to habitat for Townsend's big-eared bats and pallid bats. These species occur in nearby Lassen National Forest, and may occur within the Project area, if suitable habitat exists.

The Bat Desktop Assessment should also include resources from the Western Bat Working Group (http://wbwg.org/).

In addition to a description of methods, results, and discussion of Project impacts, the Biological Survey Report to be prepared for this Project should include analyses of known or potential nearby bat roosting sites and how the proposed Project may impact bat species traveling through the Project area between sites, a cumulative impact analysis of mortality based on the proximity to the Hatchet Ridge wind facility and recent research regarding hoary bat populations, a detailed description of acoustic analysis, and the inclusion of acoustic call vouchers. The acoustic information gathered to date may not be adequate to determine Project impacts.

Wildlife Movement Study

The Use Permit Application recognizes that the Project may have an adverse impact on migratory wildlife corridors and proposes to conduct a Site Characterization Study. The Department requests the completion of a focused wildlife movement study to document movement corridors within the Project site, not just to document wildlife concentration areas as proposed.

Deer Habitat

The Project is located within deer fawning habitat as mapped by the Department. Impacts to deer should be identified in subsequent environmental documents for this Project, including impacts from fencing, construction, noise, lighting, etc.

Rare Plants and Sensitive Natural Communities

Rare plant surveys should be conducted following the Department's November 2009 *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (provided to the County on June 28, 2017, found at: https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281280-plants). These surveys should be conducted at the appropriate time of year and under the correct conditions to identify species with potential to occupy the Project area. Surveys should include all California Rare Plant Ranked plants and all plants listed as rare, threatened, or endangered.

California Rare Plant Ranked plants either meet the definitions of CESA and are eligible for state listing (Rank 1, 2 and 3 species) or may be significant locally (Rank 4 species). Impacts to species listed as California Rare Plant Rank 1, 2, and 3 or their habitat should be analyzed during preparation of environmental documents relating to CEQA, as they may meet the definition of Rare or Endangered under CEQA Guidelines section 15125 (c) and/or section 15380. Impacts to species listed as California Rare Plant Rank 4 should be analyzed when impacts will occur to populations at the periphery of a species' range, in areas where the taxon is uncommon or has sustained heavy losses, in areas where populations exhibit unusual morphology or occur on unusual substrates, or at the type locality for the population.

Surveys should also identify any natural communities with a State rank of S1-S3. Natural communities with ranks of S1-S3 are considered sensitive natural communities to be addressed in the environmental review process. State rank S1 indicates a critically imperiled community because of its extreme rarity in the state, S2 indicates as community that is imperiled in the state, and S3 indicates a community that is vulnerable to extirpation within the state. Please see https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities for more information.

Invasive Species

The Department recommends the completion of invasive plant species mapping in order to document locations of invasive species on site and avoid or minimize the potential spread of invasive species during Project construction. Invasive species control measures should be developed and include those found in California Invasive Plant Council guidance documents, including post-construction monitoring to ensure that invasive species are not spread or introduced during construction activities.

Proposed Survey Corridors

The Use Permit Application references the use of survey corridors, which constitute areas of temporary and permanent ground-disturbing activities. More information regarding the width of these corridors is necessary. The survey area for the Project must encompass all areas of direct impact and areas in which reasonably foreseeable indirect Project impacts will occur, including areas in which sensitive species habitat would be impacted by noise from construction or ongoing maintenance activities, noise and vibrations from blasting, fugitive dust, Project lighting, habitat fragmentation, and downstream impacts to waters of the state. The survey area should encompass an area large enough to obtain an understanding of wildlife usage and movement within the Project site in order to document potential direct, indirect and cumulative impacts to wildlife, and thus allow for proper siting of turbines. Without further information, the Department does not believe the areas mapped in Figure 17 will accomplish this goal. The Department requests additional information regarding the use of survey corridors, including the width of the corridors, location of corridors in relation to Project activities, and the surveys proposed to be conducted within these corridors.

Lake or Streambed Alteration Agreement

A Lake or Streambed Alteration Agreement (LSAA) will be required for Project activities that modify a streambed and/or bank, use material from a streambed or divert or obstruct streamflow. The Project proponent will need to notify the Department pursuant to FGC section 1602. At a minimum, a notification will be required for the work proposed in on site drainages, including the replacement of culverts and ongoing maintenance of culverts discussed in the Use Permit Application. In issuing a LSAA, the Department would be acting as a Responsible Agency under CEQA, as discussed above. As such, the Department would be required by CEQA Guidelines section 15096 to review the certified CEQA document and to make certain findings concerning the activity's potential to cause significant adverse environmental effects. It is therefore important that future environmental documents address all of the potential streambed alteration impacts and propose feasible mitigation, such as those set forth below.

a. Protection and maintenance of the riparian, wetland, stream or lake systems to ensure a "no-net-loss" of habitat value and acreage.

b. Provisions for the protection of fish and wildlife resources at risk that consider various life stages, maintain migration and dispersal corridors, and protect essential breeding (i.e. spawning, nesting) habitats.

c. Delineation of buffers along streams and wetlands to provide adequate protection of aquatic resources. No grading or construction activities should be allowed within these buffers.

d. Placement of construction materials, spoils, or fill, so that they cannot be washed into aquatic resources.

e. Prevention of downstream sedimentation and pollution. Provisions may include, but not be limited to, detention basins, buffering filter strips, silt barriers, etc.

Aquatic Resources

The Use Permit Application recognizes that the Project may have adverse effects on federally protected wetlands as defined by section 404 of the Clean Water Act "*through direct removal, filling, hydrological interruption, or other means*", and proposes to conduct a desktop assessment of waters on the Project site, including wetlands, "*in order to inform preliminary design of the Project as well as future field delineation of jurisdictional waters*." The U.S. Army Corps of Engineers as well as the National Wetlands Inventory (NWI) will be consulted to determine the potential for jurisdictional waters to occur on the Project site. The USFWS website cautions that the objective of the NWI maps are to produce reconnaissance level information and are based on aerial imagery, analysis of which includes an inherent margin of error. The Department recognizes the usefulness of such databases in pre-survey planning, but cautions in relying too heavily on these resources without conducting adequate on the ground assessments and surveys.

The Department maintains responsibility for wetland and riparian habitats. It is the policy of the Department to strongly discourage development in wetlands or conversion of wetlands to uplands. In 1993, Executive Order W-59-93 established a comprehensive wetlands policy for the State that sought no overall net loss and long-term net gain in the quantity, quality and performance of wetlands acreage and values. The Fish and Game Commission also has adopted a Wetlands Resources Policy, which recognizes the habitat values of wetlands and the damage to fish and wildlife resources from projects resulting in a net loss of wetland acreage or habitat values (Fish and Game Commission 2013a). The policy states[4]:

[4] Fish and Game Commission policy available at: http://www.fgc.ca.gov/policy/p4misc.aspx#WETLANDS

> *"It is the policy for the Fish and Game Commission to seek to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it is the policy of the Fish and Game Commission to strongly discourage development in or conversion of wetlands. It opposes, consistent with its legal authority, any development or conversion, which would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission opposes wetland development proposals unless, at a minimum, project mitigation assures there will be "no net loss" of either wetland habitat values or acreage. The Commission strongly prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values."*

The Department recommends the applicant conduct a complete and thorough wetland delineation to identify wetlands or stream resources present on-site. The delineation report should include a jurisdictional delineation including wetlands identification pursuant to the USFWS wetland definition[5] as adopted by the Department[6], which utilizes hydric soils, saturation or inundation, and vegetative criteria, but requires the presence of only one of these criteria (rather than all three as required by the U.S. Army Corps of Engineers) in order to classify an area as a wetland. Many stream, wetland and riparian habitats subject to the Department's authority extend well beyond the jurisdictional limits of the U.S. Army Corps of Engineers, and must be included in the delineation. The jurisdictional delineation should also include mapping of ephemeral, intermittent, and perennial stream courses potentially impacted by the Project as well as a quantification of impacts to these resources. In addition to "federally protected wetlands" (see CEQA Appendix G), the Department considers impacts to any wetlands (as defined by the Department) as potentially significant. Site design should include provisions for protection of onsite wetlands, should they occur, including their watersheds.

Temporary Impacts and Revegetation

The Use Permit Application states that all temporarily impacted areas will be replanted/restored with "*non-aggressive resident species that are compatible with wind farm operations, replacing timber stock for future production where appropriate and with native, slow-growing shrubs and hardwoods elsewhere*." Changing the vegetation communities within the temporarily impacted areas on the Project site to habitats compatible with wind farm operations is not a temporary impact, nor is it restoration as discussed in the Use Permit, and should be analyzed as a permanent impact in future environmental documents for this Project. The Department recommends an analysis of the change in vegetation communities based on the proposed replanting scheme. The

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[5] Cowardin, Lewis M., et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service.
[6] California Fish and Game Commission Policies: Wetlands Resources Policy; Wetland Definition, Mitigation Strategies, and Habitat Value Assessment Strategy; Amended 1994.

Department supports the use of native species in revegetation efforts; however, the species should be representative of the native species currently occupying the Project site. A detailed revegetation plan should be developed for review.

Additionally, clearing for collector lines and subsequent vegetation management under these lines that will "*remain permanently disturbed with low vegetation and two-track access for maintenance*" should not be considered a temporary impact. The Use Permit Application concludes that the permanent impacts from this activity would be limited to individual pole locations. As stated above, the change in the vegetation community would require this impact to be considered and analyzed as a permanent impact.

Consultation with Local Stakeholders

The Department recommends consultation with local environmental groups and experts, including local Audubon chapters and staff from universities and colleges as discussed in the CEC/CDFG Guidelines. These consultations may provide critical information regarding wildlife usage near the Project site and aid in identifying potentially adverse impacts of the Project.

Tower Lighting

The Use Permit specifies that flashing red lights will be installed on turbines and meteorological towers to improve nighttime visibility for aviation. In order to minimize impacts to birds moving across the landscape at night, the Department recommends following USFWS WEG and Communication Tower Guidance (USFWS 2016) for tower lighting by utilizing the minimum number of lights required, at the minimum intensity, and the minimum number of flashes per minute (i.e., longest duration between flashes and "dark phase"), with all lights synchronized to flash simultaneously.

Overhead Electrical Lines

The Department is concerned with the risk of bird strike and electrocution posed by the proposed 16 miles of overhead collector lines. Additionally, the poles associated with these lines provide perch and nesting locations that may attract raptors into the Project area. To reduce the potential for avian collisions, and provide consistency with the CEC/CDFG Guidelines and WEG, the Department advises that overhead electrical collector lines be placed underground to the maximum extent possible. Project evaluation must include consideration of the wildlife- and habitat-related impacts of both above- and below-ground electrical lines.

Grading and Erosion Control

Section 2.3.1 – Grading, of the Use Permit Application discusses the preparation of a Temporary Erosion and Sediment Control Plant and the use of standard storm water BMPs to reduce the risk of erosion. Additional erosion control BMPs may be required in the LSAA issued for this Project. Erosion control methods must be monitored and maintained in good working order throughout the life of the Project.

All access roads, whether newly constructed or existing should be constructed, upgraded, and maintained consistent with the guidance presented in the *Handbook for Forest, Ranch, and Rural Roads* (http://www.pacificwatershed.com/roadshandbook.) This section also discusses the potential for blasting to loosen rock prior to excavation. The proposed Blasting Plan should include measures to protect special-status species and sensitive natural communities.

Hazardous Materials

The Use Permit Application states that refueling and hazardous materials storage will not take place within 100 feet of a drainage channel or structure. Depending on site-specific conditions and topography, this distance may need to be increased. In addition to drainages, all hazardous materials must be kept away from any special-status species habitat and/or sensitive natural communities found on the Project site. Appropriate buffers should be developed through additional consultation with resource agencies. The Use Permit Application also states that BMPs will be implemented to ensure "impacts are minor". Any potential impacts to special-status species, sensitive natural communities, or onsite drainages from hazardous materials must be mitigated to a level of less than significant.

Review of Biological Studies

The Department requests that biological studies conducted for the Fountain Wind Project be sent to the Department for review prior to the release of the draft EIR for this Project.

Environmental Data

CEQA requires that information developed in EIRs and negative declarations be incorporated into a database that may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code § 21003, subd. (e)). Accordingly, any special status species and sensitive natural communities detected during Project surveys must be reported to the California Natural Diversity Database (CNDDB). The online submission and PDF CNNDB field survey forms, as well as information on which species are tracked by the CNDDB, can be found under their corresponding tabs at the following link: https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data.

Additionally, the Department requests that field survey forms be submitted to the Northern Region office at: Attn: CEQA, 601 Locust Street, Redding, CA, 96001.

Bat acoustic data should also be submitted to the Bat Acoustic Monitoring Portal (BatAMP). Information on BatAMP and submitting data can be found here: https://batamp.databasin.org/.

The Department appreciates the opportunity to provide comments early in the environmental review process and looks forward to providing further comments and guidance as data collection and the review process proceeds. If you have any questions, please contact Kristin Hubbard, Environmental Scientist, at (530) 225-2138, or by e-mail at Kristin.Hubbard@wildlife.ca.gov.

Sincerely,

for

Curt Babcock
Habitat Conservation Program Manager

References

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ec: Bill Walker, Kim Hunter
Shasta County Department of Resource Management
bwalker@co.shasta.ca.us, khunter@co.shasta.ca.us

Robert H. Doster
U.S. Fish and Wildlife Service
Rob_Doster@fws.gov

Matt Kelley
U.S. Army Corps of Engineers
Matthew.P.Kelley@usace.army.mil

Dannas J. Berchtold
Central Valley Regional Water Quality Control Board
Dannas.Berchtold@waterboards.ca.gov

Kristin Hubbard, Michael R. Harris
California Department of Fish and Wildlife
Kristin.Hubbard@wildlife.ca.gov; Michael.R.Harris@wildlife.ca.gov

From: Hubbard, Kristin@Wildlife
To: Bill Walker
Cc: Battistone, Carie@Wildlife; Burkett, Esther@Wildlife
Subject: Fountain Wind Helicopter Survey Permit Requirements
Date: Wednesday, March 07, 2018 11:39:25 AM

Hi Bill,

I just recently received guidance from our Statewide Raptor Coordinator, Carie Battistone, that a Memorandum of Understanding (MOU) with the Department is required for aerial raptor surveys such as those being conducted for the Fountain Wind Project. The reason behind this is that helicopter surveys are not a passive monitoring tool, and if not performed correctly, can result in nest failure or take of eggs, nestlings, or adults of State Listed and/or Fully Protected raptors, which are protected under State law. More information can be found here: http://www.dfg.ca.gov/wildlife/nongame/research_permit/mou.html. As stated on our website, the MOU process for Fully Protected species requires a minimum of 6 weeks processing time.

Please forward this email to the Fountain Wind Project applicant to advise them to contact Carie Battistone at Carie.Battistone@wildlife.ca.gov, or Esther Burkett in her absence at: Esther.Burkett@wildlife.ca.gov, in order to apply for an MOU.

Thank you,
Kristin

Kristin Hubbard
Environmental Scientist
California Department of Fish and Wildlife
2440 Athens Avenue
Redding, CA 96001
(530) 225-2138

From: Gonzalez, Marcelino@DOT <marcelino.gonzalez@dot.ca.gov>
Sent: Wednesday, January 31, 2018 10:57 AM
To: Bill Walker
Cc: Grah, Kathy M@DOT; Pascal, Anthony C@DOT; Stinger Jr, Rob F@DOT; Veatch, Steve C@DOT
Subject: FW: Sha-299-68.1 Wind Turbines

Bill,

Regarding the new Pacific Wind Development (UP 16-007) turbine project. Our main comment is that the project description include that coordination will occur with Caltrans and CHP regarding the transport of turbine equipment and materials due to the potential oversize and weight of the materials to prevent damage to the highways and surrounding infrastructure while minimizing the impact on the travelling public.

Thanks for the opportunity to review. If you prefer a letter response, let me know.

Marcelino "Marci " Gonzalez
Local Development Review
& Regional Transportation Planner
(530)225-3369

-----Original Message-----
From: Barnes, Stacey@DOT
Sent: Friday, January 12, 2018 1:30 PM
To: Gonzalez, Marcelino@DOT <marcelino.gonzalez@dot.ca.gov>; Pascal, Anthony C@DOT <anthony.pascal@dot.ca.gov>; Veatch, Steve C@DOT <steve.veatch@dot.ca.gov>
Cc: Anderson, Don L@DOT <don.anderson@dot.ca.gov>; Grah, Kathy M@DOT <kathy.grah@dot.ca.gov>; Balkow, Thomas C@DOT <thomas.balkow@dot.ca.gov>; Moore, David E@DOT <dave.moore@dot.ca.gov>; Akana, Eric E@DOT <eric.akana@dot.ca.gov>; Orr, Eric D@DOT <eric.orr@dot.ca.gov>; Casas, Aaron D@DOT <Aaron.Casas@dot.ca.gov>; Rich, Tamara J@DOT <tamara.j.rich@dot.ca.gov>; Maxwell, John G@DOT <john.maxwell@dot.ca.gov>; Stinger Jr, Rob F@DOT <rob.stinger@dot.ca.gov>; Anderson, Don L@DOT <don.anderson@dot.ca.gov>
Subject: RE: Sha-299-68.1 Wind Turbines LESSONS LEARNED due Feb 2

I recall a large meeting, and you may have been there, with a representative from the Hatchet wind farm, CHP, Jan Meyers from TMC, Ed Lamkin, and others possibly. It was quite an orchestration effort, and I think the work put into establishing the route and logistics went a long way to preventing any permanent damage to the highway route. According to Clint Burkenpas, who was the TMC manager at the time, Jan thoroughly went over the route with the representative and drove it ahead of time, identifying all the possible obstacles, and even went so far as to change out signs to make them temporarily removable to easily accommodate the large transport vehicles. It may also help to take before and after pictures of concern areas? It's a little tough to pin mitigation on them when there is no encroachment permit involved, unless we plan to make them expand the road connection. Rob may have been part of that meeting, maybe he can add his two cents. I don't think Transportation Permits was too involved other than issuing them a permit for transport.

Stacey Barnes, PE
Project Manager Plumas Co.
Caltrans District 2
(530) 225-3439

-----Original Message-----
From: Gonzalez, Marcelino@DOT
Sent: Friday, January 12, 2018 10:28 AM

To: Barnes, Stacey@DOT <stacey.barnes@dot.ca.gov>; Pascal, Anthony C@DOT <anthony.pascal@dot.ca.gov>; Veatch, Steve C@DOT <steve.veatch@dot.ca.gov>
Cc: Anderson, Don L@DOT <don.anderson@dot.ca.gov>; Grah, Kathy M@DOT <kathy.grah@dot.ca.gov>; Balkow, Thomas C@DOT <thomas.balkow@dot.ca.gov>; Moore, David E@DOT <dave.moore@dot.ca.gov>; Akana, Eric E@DOT <eric.akana@dot.ca.gov>; Orr, Eric D@DOT <eric.orr@dot.ca.gov>; Casas, Aaron D@DOT <Aaron.Casas@dot.ca.gov>; Rich, Tamara J@DOT <tamara.j.rich@dot.ca.gov>; Maxwell, John G@DOT <john.maxwell@dot.ca.gov>
Subject: Sha-299-68.1 Wind Turbines LESSONS LEARNED due Feb 2

Stacey and all,

Do we have any 'Lessons Learned' from the Hatchet Wind project? Extreme Heavy loads, CHP escorts. Will these things damage highway pavement in transport? Is that mitigatable?

Anything that we want the County to consider in their environmental review to allow a NEW wind turbine project with even larger turbines and a lot more of them, if it gets approved?

Comments, concerns, suggestion. Response by Feb 2.

http://www.redding.com/story/news/2017/12/28/portland-firm-wants-build-100-turbine-wind-project-california/975861001/

Portland firm wants to build 100-turbine wind project near Burney

A Portland, Oregon, firm has filed an application to build up to 100 wind turbines - more than twice as many as Hatchet Ridge - in eastern Shasta County.

The turbines would be located north and south of Highway 299 and west of the Hatchet Ridge wind energy project completed in 2010.

The turbines proposed by Pacific Wind Development could also dwarf the 418-foot-tall turbines on Hatchet Ridge, where there are 44 turbines.

While turbine heights haven't been decided, the firm's application says they could be up to 591 feet tall, nearly as high as the 602-foot Shasta Dam.

William Carlson said he can see the Hatchett Ridge turbines from his home north of Redding. Having another set of turbines built closer to where he lives would be worse.

"I think the closer it gets to Redding, the more objectionable it is," Carlson said.

The massive project would be built on 37,436 acres leased from Oxbow Timber I LLC. When operating at capacity, the turbines could produce up to 347 megawatts of electricity, enough to power about 260,000 homes, according to a formula from the Lawrence Livermore Labs.

At buildout, the Fountain Wind Project would have about 12 full-time employees, according to a report submitted with an application to the Shasta County Planning Department.

Pacific Wind Development set up monitoring towers several years ago to test whether the area east of Montgomery Creek was suitable for further wind development.

Scott Kringen, the project developer, said the company is in the early stages of development and will need to go through approval through several local, state and federal agencies.

Shasta County planning officials said the project will likely have to go through a thorough environmental analysis.

"Again, it's very early, and we have lots of work to do, but we think we have a great wind farm site here that can create jobs and deliver a new source of clean energy for Californians," Kringen said.

But Carlson said he didn't believe the benefit of clean energy was worth the cost of ruining the view in a county heavily dependent on tourists who visit the area to enjoy the outdoors.

"For the environmental benefits you get, it's too steep of a price to pay for the (loss of) aesthetics," he said.

The application report says views of the turbines are expected because of their height and exposed locations.

"In addition to the size, form and color of the turbines, another source of visual contrast from the operation of the project would be the introduction of motion into a static landscape," the report says.

Carolyn Adams of Burney said she initially opposed the Hatchet Ridge wind turbines, which can be seen from her home. But over the years she has grown used to seeing the turbine blades turning on the hilltop west of Burney.

Jim Wiegand of Redding said he thinks the wind turbines will be bad for birds because they will be killed by the turbine blades.

OPINION: It's not too late to help slow climate change

"I'm real sad to hear this," Wiegand said after hearing the news about the proposed wind development. "These turbines slaughter everything. It's really sad."

Kringen said the company will work to minimize impacts on birds.

"Wind farms can have an impact on birds, which is why we collaboratively work with stakeholders, scientists and reputable avian organizations to minimize those impacts and find a sustainable path forward," he said.

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for Environmental Protection

Central Valley Regional Water Quality Control Board

5 February 2018

Bill Walker, Senior Planner
Shasta County Planning Division
1855 Placer Street, Suite 103
Redding, CA 96001

REQUEST FOR COMMENTS FOR USE PERMIT 16-007 (FOUNTAIN WIND PROJECT), SHASTA COUNTY

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) is a responsible agency for this project, as defined by the California Environmental Quality Act (CEQA). On 12 January 2018, we received your request for comments on Use Permit 16-007 (Fountain Wind Project).

The applicant is proposing to construct and operate the Fountain Wind Project (Project) which would consist of up to 100 wind turbines and associated infrastructures, with a generating capacity of up to approximately 347 megawatts. The proposed Project will be on 94 Assessor parcels covering about 38,000 acres. In addition to the wind turbines including associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components.

Based on our review of the information submitted for the proposed project, we have the following comments:

General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (CGP)
Construction activity, including demolition, resulting in a land disturbance of one acre or more must obtain coverage under the CGP. Use Permit 16-007 (Fountain Wind Project) must be conditioned to implement storm water pollution controls during construction and post-construction as required by the CGP. To apply for coverage under the CGP the property owner must submit Permit Registration Documents electronically prior to construction. Detailed information on the CGP can be found on the State Water Board website: http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/construction_general_permits

Clean Water Act (CWA) Section 401, Water Quality Certification
The Central Valley Water Board has regulatory authority over wetlands and waterways under the Federal Clean Water Act (CWA) and the California Water Code, Division 7 (CWC). Discharge of dredged or fill material to waters of the United States requires a CWA Section 401 Water Quality Certification from the Central Valley Water Board. Typical activities include any modifications to these waters, such as stream crossings, stream bank modifications, filling of wetlands, etc. 401 Certifications are issued in combination with CWA Section 404 Permits issued by the Army Corps of Engineers. The proposed project must be evaluated for the presence of jurisdictional waters, including wetlands and other waters of the State. Steps must

be taken to first avoid and minimize impacts to these waters, and then mitigate for unavoidable impacts. Both the Section 404 Permit and Section 401 Water Quality Certification must be obtained prior to site disturbance. Any person discharging dredge or fill materials to waters of the State must file a report of waste discharge pursuant to Sections 13376 and 13260 of the California Water Code. Both the requirements to submit a report of waste discharge and apply for a Water Quality Certification may be met using the same application form, found at: http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/wqc_application.pdf

General Order of Waste Discharge Requirements for Timberland Management Activities on Non-Federal and Federal Lands (Order No. R5-2017-0061)

The Fountain Wind Project proposes to convert 972 acres of private timberlands to non-timberland use in the area where there is to be permanent Project disturbance. As stated in the proposal, this conversion will require a Timberland Conversion Permit through the California Department of Forestry & Fire Protection. Additionally, activities described within the project proposal suggest that timber harvest may occur within temporary disturbance areas. Pursuant to the California Water Code, any person that discharges waste or threatens to discharge waste from timber harvesting activities that could affect the quality of the waters of the state must apply for coverage under the General Order of Waste Discharge Requirements for Timberland Management on Non-Federal and Federal Lands (Order No. R5-2017-0061)). If your timber harvesting activities pose a threat to water quality, you must apply for coverage under the General Order prior to the start of timber operations, or file for Waste Discharge Requirements at least 90 days prior to the start of operations. Failure to do so can result in civil liabilities of up to $5000 for each day the violation occurs (see California Water Code Section 13261).

All new projects submitted for permit enrollment, on or after 9 June 2017, should request enrollment under the appropriate General Order category. Forms and associated documents for General Order enrollment are available at the following web address: https://www.waterboards.ca.gov/centralvalley/water_issues/forest_activities/

Enrollment in the Waiver may require you to conduct monitoring of the project area and submit a report each year after operations begin and until the Central Valley Water Board has accepted a Notice of Termination.

If you have any questions or comments regarding this matter please contact me at (530) 224-4783 or by email at Dannas.Berchtold@waterboards.ca.gov.

Dannas J. Berchtold
Engineering Associate
Storm Water & Water Quality Certification Unit

DJB: db

cc w/o enclosures: Mr. Matt Kelley, U.S. Army Corps of Engineers, Redding
Ms. Donna Cobb, Department of Fish and Wildlife, Region 1, Redding

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
PLANNING DIVISION
1855 Placer Street, Suite 103, Redding, CA 96001
Date Sent: January 10, 2018

TO INTERESTED/AFFECTED AGENCIES:
Shasta County, acting as the lead agency under the California Environmental Quality Act (CEQA), has determined that an Initial Study will be required for the project described below. This is a request for informal consultation with you or your agency, as required by CEQA Guidelines Section 15063 (g), prior to the preparation of the Initial Study. Please review and comment on the project, and return this form (with comments attached if more space is needed) prior to: **February 9, 2018.**

PROJECT DATA

PROJECT: Use Permit 16-007 (Fountain Wind project)

APPLICANT: Pacific Wind Development, LLC, 1125 Couch Street, Suite 700, Portland, OR 97209

PROJECT DESCRIPTION: The applicant proposes to construct and operate the Fountain Wind Project (Project) which would consist of up to 100 wind turbines and associated infrastructures, with a generating capacity of up to approximately 347 megawatts. The proposed Project would be on 94 Assessor parcels covering about 38,000 acres. In addition to the wind turbines including associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components. For more project information please refer to the project narrative and figures on the Planning Division website:

https://www.co.shasta.ca.us/index/drm_index/planning_index/eirs/fountain-wind-project/Project-Description

LOCATION: The project site is located on the west side of the Cascade Range in Shasta County on portions of about 38,000 acres owned by Oxbow Timber I, LLC, located both north and south of State Highway 299 East, to the east of the communities of Montgomery Creek and Round Mountain, and west of Hatchet Mountain Pass. The project site is about 6 miles west of the community of Burney, and about 35 miles east of the City of Redding. For more precise location information, please refer to the project narrative and figures on our website above. Also see Vicinity Map on following page.

AGENCY RESPONSE

☐ No Comment: Note: Your agency's approval will be assumed if no response is received by the above date.

☒ We have reviewed the subject proposal and offer the following comment(s):

Signed: Chuck Wadowski - FRONTIER FACILITIES EXIST ALONG HWY 299.

For (Agency): CHUCK WADOWSKI - FRONTIER COMMUNICATIONS

Any questions may be directed to Bill Walker, Senior Planner at (530) 225-5532, or bwalker@co.shasta.ca.us

Sincerely,

W. M. Walker

Bill Walker, AICP, Senior Planner
Planning Division
Department of Resource Management

From: Brandy McDaniels <bmcdaniels@pitrivertribe.org>
Sent: Saturday, February 10, 2018 11:11 PM
To: Bill Walker
Cc: mickydb@hotmail.com; Mickey Gemmill; Charles White; Yatch Bamford; Buzz Ward
Subject: Use Permit 16-007 (Fountain Wind project) Pacific Wind Development, LLC

Bill Walker, AICP, Senior Planner,
While your maps are of poor quality and resolution on your project description web page, it is clear that the Fountain Wind project is entirely within the Ancestral territories of the Pit River Tribe. Specifically the Ancestral boundaries of the Madesi, Itsatawi, and Atsugewi Bands of the Pit River Tribe. Therefore I am requesting the following information regarding this project so that adverse impacts to historical, traditional religious, and cultural properties can be evaluated:

- Draft Cultural Resource report
- Ground water recharge analysis
- Viewshed analysis and potential impacts to visual resources report
- Biological surveys
- Site Characterization studies, which include but are not limited to animals, plants, and habitat.
- Request that a sensitive species survey be conducted, if it has not already been completed.
- Bat desktop assessment
- Economic impact

Regards,
Brandy McDaniels, Madesi Band Cultural Representative for the Pit River Tribe
530-515-6933

John Waldrop
AQ RECEIVED

JAN 10 2018

Shasta County AQMD

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
PLANNING DIVISION
1855 Placer Street, Suite 103, Redding, CA 96001
Date Sent: January 10, 2018

TO INTERESTED/AFFECTED AGENCIES:
Shasta County, acting as the lead agency under the California Environmental Quality Act (CEQA), has determined that an Initial Study will be required for the project described below. This is a request for informal consultation with you or your agency, as required by CEQA Guidelines Section 15063 (g), prior to the preparation of the Initial Study. Please review and comment on the project, and return this form (with comments attached if more space is needed) prior to: **February 9, 2018.**

* *

PROJECT DATA

PROJECT: Use Permit 16-007 (Fountain Wind project)

APPLICANT: Pacific Wind Development, LLC, 1125 Couch Street, Suite 700, Portland, OR 97209

PROJECT DESCRIPTION: The applicant proposes to construct and operate the Fountain Wind Project (Project) which would consist of up to 100 wind turbines and associated infrastructures, with a generating capacity of up to approximately 347 megawatts. The proposed Project would be on 94 Assessor parcels covering about 38,000 acres. In addition to the wind turbines including associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components. For more project information please refer to the project narrative and figures on the Planning Division website:

https://www.co.shasta.ca.us/index/drm_index/planning_index/eirs/fountain-wind-project/Project-Description

LOCATION: The project site is located on the west side of the Cascade Range in Shasta County on portions of about 38,000 acres owned by Oxbow Timber I, LLC, located both north and south of State Highway 299 East, to the east of the communities of Montgomery Creek and Round Mountain, and west of Hatchet Mountain Pass. The project site is about 6 miles west of the community of Burney, and about 35 miles east of the City of Redding. For more precise location information, please refer to the project narrative and figures on our website above. Also see Vicinity Map on following page.

* *

AGENCY RESPONSE

☐ No Comment: Note: Your agency's approval will be assumed if no response is received by the above date.

☒ We have reviewed the subject proposal and offer the following comment(s):

Signed: John G. Waldrop

For (Agency): Shasta County AQMD

* *

Any questions may be directed to Bill Walker, Senior Planner at (530) 225-5532, or bwalker@co.shasta.ca.us

Sincerely,

W. M. Walker

Bill Walker, AICP, Senior Planner
Planning Division
Department of Resource Management

Shasta County AQMD Comments Regarding Fountain Wind Project 16-007

The informal comments below are provided to the Shasta County Planning Division in relation to the Fountain Wind Project.

Construction phase emissions-
Associated with heavy-duty equipment, fugitive dust, and emissions from construction vehicles traveling to and from each component site, grubbing/land clearing and grading/excavation.

Assess for and apply Standard Mitigation Measures- Potential mitigation measures are listed below.

Particulate Matter- PM10

-Alternatives to open burning of vegetative material on the project site will be used by the project applicant unless otherwise deemed infeasible by the AQMD. Examples of suitable alternatives are chipping, mulching, and conversion to biomass fuel.
-The applicant will be responsible for ensuring that all adequate dust control measures are implemented in a timely and effective manner during all phases of project development and construction.
-All material excavated, stockpiled, or graded should be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering should occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day.
-All areas (including unpaved roads) with vehicle traffic should be watered periodically or have dust palliatives applied for stabilization of dust emissions.
-All onsite vehicles should be limited to a speed of 15 miles per hour on unpaved roads.
-All land clearing, grading, earth moving, and excavation activities on a project will be suspended when winds are expected to exceed 20 miles per hour.

-All inactive portions of the development site should be seeded and watered until suitable grass cover is established.
-The applicant will be responsible for applying (according to manufacturer's specifications) nontoxic soil stabilizers to all inactive construction areas (previously graded areas that remain inactive for 96 hours) in accordance with the Shasta County Grading Ordinance.
-All trucks hauling dirt, sand, soil, or other loose material should be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of the load and top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114. This provision will be enforced by local law enforcement agencies.
-All material transported off site will be either sufficiently watered or securely

covered to prevent a public nuisance.
-During initial grading, earth moving, or site preparation, the project will be required to construct a paved (or dust palliative–treated) apron, at least 100 feet in length, onto the project site from the adjacent paved road(s).
-Paved streets adjacent to the development site should be swept or washed at the end of each day to remove excessive accumulations of silt and/or mud that may have accumulated as a result of activities on the development site.
-Adjacent paved streets will be swept at the end of each day if substantial volumes of soil materials have been carried onto adjacent public paved roads from the project site.
-Wheel washers will be installed where project vehicles and/or equipment enter and/or exit onto paved streets from unpaved roads. Vehicles and/or equipment will be washed prior to each trip.
- Prior to final occupancy, the applicant will reestablish ground cover on the construction site through seeding and watering in accordance with the Shasta County Grading Ordinance.

PM 2.5, NOx, ROG

-Limit the area subject to excavation, grading, and other construction activity at any given time.
-Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.
-Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run by a portable generator set).
-Require that all diesel engines be shut off when not in use to reduce emissions from idling.
-During the smog season (May through October), lengthen the construction period to minimize the number of vehicles and equipment operating at the same time.
-Off-road trucks should be equipped with on-road engines when possible.
-Minimize obstruction of traffic on adjacent roadways.
-Power construction equipment with diesel engines fueled by alternative diesel fuel blends or ultra low sulfur diesel (ULSD). Only fuels that have been certified by ARB should be used. ARB has verified specific alternative diesel fuel blends for NOX and PM emission reduction. The applicant should also use ARB-certified alternative fueled (compressed natural gas [CNG], liquid propane gas [LPG], electric motors, or other ARB certified off-road technologies] engines in construction equipment where practicable.
-Use construction equipment that meets the current off-road engine emission standard (as certified by ARB) or that is re-powered with an engine that meets this standard.

Operational phase emissions- Identify any type of equipment that may require a District permit such as backup generators.

January 16, 2018- JW

RECEIVED
SHASTA COUNTY

JAN 16 2018

DEPT OF RESOURCE MGMT
PLANNING DIVISION

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
PLANNING DIVISION
1855 Placer Street, Suite 103, Redding, CA 96001
Date Sent: January 10, 2018

TO INTERESTED/AFFECTED AGENCIES:
Shasta County, acting as the lead agency under the California Environmental Quality Act (CEQA), has determined that an Initial Study will be required for the project described below. This is a request for informal consultation with you or your agency, as required by CEQA Guidelines Section 15063 (g), prior to the preparation of the Initial Study. Please review and comment on the project, and return this form (with comments attached if more space is needed) prior to: **February 9, 2018.**

* *

PROJECT DATA

PROJECT: Use Permit 16-007 (Fountain Wind project)

APPLICANT: Pacific Wind Development, LLC, 1125 Couch Street, Suite 700, Portland, OR 97209

PROJECT DESCRIPTION: The applicant proposes to construct and operate the Fountain Wind Project (Project) which would consist of up to 100 wind turbines and associated infrastructures, with a generating capacity of up to approximately 347 megawatts. The proposed Project would be on 94 Assessor parcels covering about 38,000 acres. In addition to the wind turbines including associated transformers, the Project includes ancillary facilities such as lay-down areas, access roads, underground and overhead collector lines, an operation and maintenance building, and substation components. For more project information please refer to the project narrative and figures on the Planning Division website:

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* *

AGENCY RESPONSE

☒ No Comment: Note: Your agency's approval will be assumed if no response is received by the above date.

☐ We have reviewed the subject proposal and offer the following comment(s):

Signed: [signature]

For (Agency): Shasta County Assessor/Recorder

* *

Any questions may be directed to Bill Walker, Senior Planner at (530) 225-5532, or bwalker@co.shasta.ca.us

Sincerely,

W. M. Walker

Bill Walker, AICP, Senior Planner
Planning Division
Department of Resource Management

From: James Zanotelli <Jimmy.Zanotelli@fire.ca.gov>
Sent: Thursday, February 01, 2018 9:40 AM
To: Bill Walker
Subject: Fountain Wind Project

Bill,

I looked over the info on the county website. I have a few comments. I did not see the info below listed in the report. I'm not sure if this is the point to make these request, or wait to add the comments to the official conditions for the project.

1. There isn't any mention in their fire protection plan of fire hydrants, fire systems or fire water on-site for firefighting purposes.
2. The O&M building for the Hatchet project had fire sprinklers, I would assume the O&M building for this project would require the same.
3. SCFD would like 5000 gallon water tanks placed in strategic locations throughout the wind farm for firefighting.

Jimmy Zanotelli
Fire Marshal
Shasta County Fire Department
530-225-2425
jimmy.zanotelli@fire.ca.gov

SHASTA COUNTY

Office of the Sheriff

Tom Bosenko
SHERIFF - CORONER

FAX COVER SHEET

DATE: 02/08/18

TO: BILL WALKER

SHASTA COUNTY DEPT. OF RESOURCE MANAGEMENT

FROM: LT. TYLER THOMPSON

TOTAL # OF PAGES (including transmittal sheet): 3

If not received correctly, please call: 245-6977

MESSAGE:

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
PLANNING DIVISION
1855 Placer Street, Suite 103, Redding, CA 96001
Date Sent: January 10, 2018

TO INTERESTED/AFFECTED AGENCIES:
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****

AGENCY RESPONSE

☐ No Comment: Note: Your agency's approval will be assumed if no response is received by the above date.

☒ We have reviewed the subject proposal and offer the following comment(s): SEE ATTACHED

Signed: [signature]

For (Agency): SHASTA COUNTY SHERIFF'S OFFICE

****

Any questions may be directed to Bill Walker, Senior Planner at (530) 225-5532, or bwalker@co.shasta.ca.us

Sincerely,

W. M. Walker

Bill Walker, AICP, Senior Planner
Planning Division
Department of Resource Management

SHASTA COUNTY

Office of the Sheriff

Tom Bosenko
SHERIFF - CORONER

Bill Walker, Senior Planner
Planning Division
Department of Resource Management

02/07/18

RE: Use Permit 16-007

DIRECT IMPACT FOR PUBLIC SAFETY/LAW ENFORCEMENT SERVICE:

The Shasta County Sheriff's Office is the primary law enforcement agency for the 94 Assessor parcels covering approximately 38,000 acres located on the west side of the Cascade Range, about six miles west of the town of Burney in Shasta County. This is the proposed sight of the Fountain Wind Project which would consist of up to 100 wind turbines and associated infrastructures.

The Shasta County Sheriff's Office would like further analysis to identify the impact the Fountain Wind Project will have on public safety and the law enforcement services supplied by the Shasta County Sheriff's Office.

Tyler Thompson, Lieutenant
Burney Patrol Station
(530) 245-6158

SHASTA COUNTY DEPARTMENT OF RESOURCE MANAGEMENT
PLANNING DIVISION
1855 Placer Street, Suite 103, Redding, CA 96001
Date Sent: January 10, 2018

TO INTERESTED/AFFECTED AGENCIES:
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AGENCY RESPONSE

☒ No Comment: Note: Your agency's approval will be assumed if no response is received by the above date.

☐ We have reviewed ~~the subject proposal and offer~~ the following comment(s):

Signed: _____

For (Agency): Shasta Mosquito and Vector Control District

Any questions may be directed to Bill Walker, Senior Planner at (530) 225-5532, or bwalker@co.shasta.ca.us

Sincerely,

W. M. Walker

Bill Walker, AICP, Senior Planner
Planning Division
Department of Resource Management

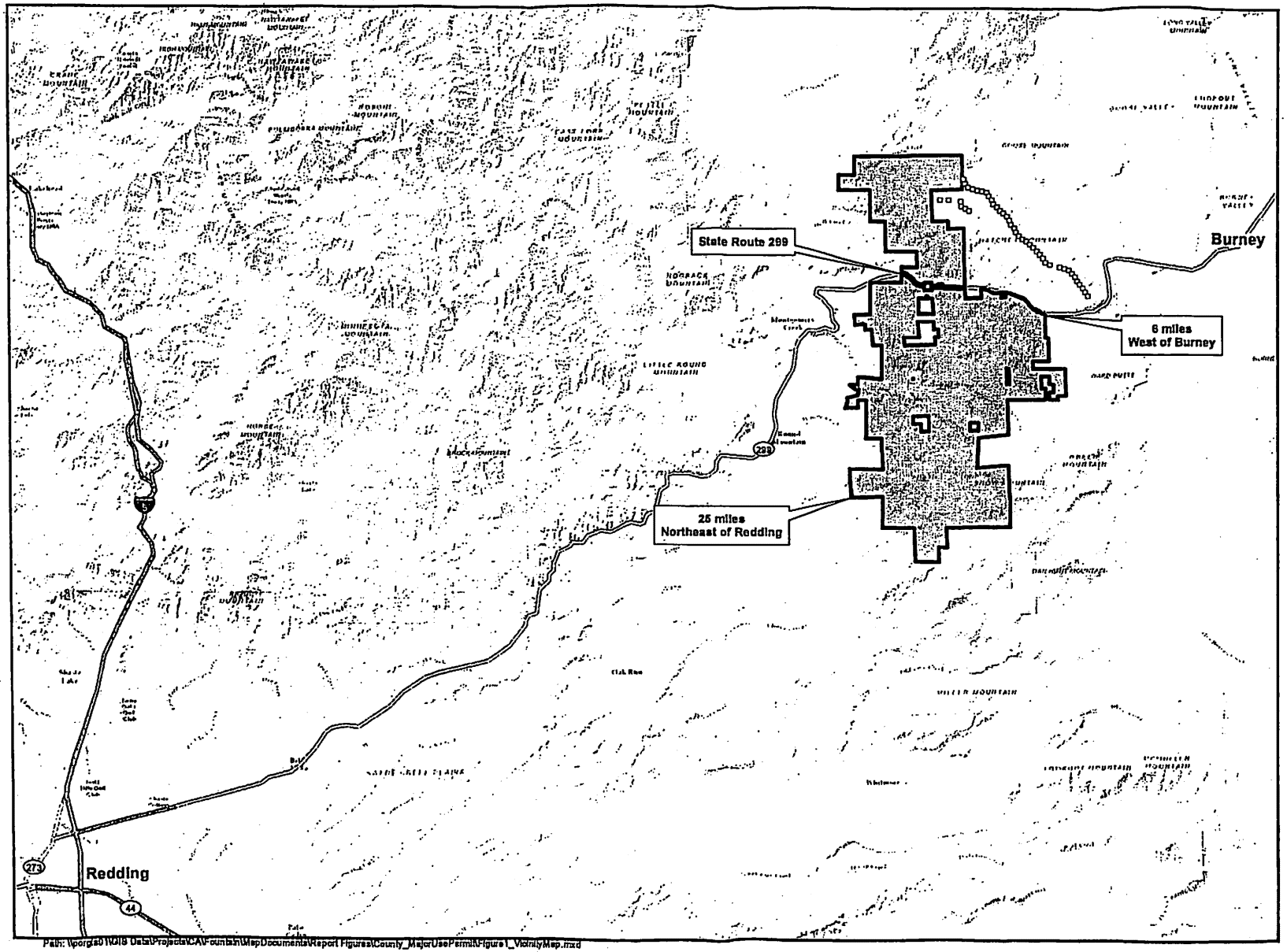

Figure 1
Vicinity Map

Fountain Wind Project

Legend

- Existing Hatchet Ridge Wind Farm Turbine
- Project Boundary

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Miles

AVANGRID RENEWABLES

Path: \\porgis01\GIS Data\Projects\CAV-ountain\MapDocuments\Report Figures\County_MajorUsePermit\Figure1_VicinityMap.mxd

Modified Date: 10/18/2017

Wintu Audubon Society

Birding in Northern California

PO Box 994533
Redding, CA 96099-4533
wintuaudubon.org

February 14, 2018

Bill Walker, Senior Planner
Shasta County Department of Resource Management
1855 Placer St., Suite 103
Redding, CA 96001

Subject: Use Permit Application 16-007 (Fountain Wind), Informal Consultation per CCR 15063(g)

Dear Mr. Walker:

Wintu Audubon welcomes the opportunity to respond to your request for comments pursuant to CCR 15063(g). Wintu Audubon has approximately 450 members in Shasta County. Wintu Audubon is prepared and pleased to offer its services as a local conservation organization with special knowledge of wildlife potentially impacted by the project. We are concerned about the bird, bat and other wildlife impacts that may result from this major wind development project, and wish to be certain that appropriate studies and surveys are conducted in advance of the preparation of California Environmental Quality Act (CEQA) documents, so that appropriate measures to minimize impacts (including but not limited to turbine and road siting and layout redesign) and appropriate mitigation for impacts which cannot be adequately reduced are fully examined and disclosed during the CEQA process rather than after it.

Due to the potential for mortality to or displacement of special status bird and bat species, that inhabit or migrate through this area (eg. greater Sandhill crane, bald eagle, willow flycatcher, yellow warbler, great grey owl), and potential for fragmentation of their habitats, Wintu Audubon believes an Environmental Impact Report (EIR) must be required for this project. We caution that the results of mortality surveys at the nearby Hatchet Ridge site, although a part of the information sources that are available, must not be used as predominant evidence that bird mortalities will be similar at the site in question. Many habitat features of this site are quite different from the Hatchet Ridge site, including but not limited to variability of terrain and landforms, variability and age classes of conifer species, post-Fountain Fire vegetation characteristics, water features present including seasonal and perennial ponds, lakes and wetlands, and presence of fish-bearing streams. In addition, unlike the Hatchet Ridge wind

farm, the proposed (and alternate) turbine sites are much more widespread across the project area.

We note from a review of the applicant's timelines for CEQA document preparation and wildlife (including bird and bat) surveys, that the applicant may anticipate preparation of draft CEQA documents prior to full completion and report preparation for those surveys. This would be counter to the intent of CEQA to fully disclose the likelihood of impacts prior to circulation of CEQA documents rather than after it, and counter to California Energy Commission's CALIFORNIA GUIDELINES FOR REDUCING IMPACTS TO BIRDS AND BATS FROM WIND ENERGY DEVELOPMENT (2007). We submit that all bird and bat use surveys should be completed and incorporated by reference in advance of the release of the draft EIR, so that their conclusions may fully advise the impact, avoidance and mitigation analyses of the EIR.

It is difficult to comment on the adequacy of the design of bird surveys which are currently underway, and perhaps in major portion nearly completed. Point count locations are not displayed with sufficient detail relative to the landforms and habitats in the project area to allow any determination of their adequacy, both in number and location. Moreover, a full analysis of bird habitat types in the project area should be performed to provide the basis for the design of the surveys. We do not have adequate information to determine to what extent and how this was done. We are concerned that bird surveys have been and may continue to be carried out only during spring and fall periods. The area's use by certain bird species such as raptors may vary seasonally by habitat type, so surveys only conducted in spring and fall may not disclose summer foraging ranges by raptors, for example.

For small birds including passerines, the application states 2 years of surveys will be conducted during vernal and autumnal migration windows beginning April, 2017. It further states "completion of this effort will result in data for inclusion in a draft Biological Survey Report, which will be available by first quarter 2018." As noted above, these milestone dates are inconsistent and appear not to comport with the applicant's CEQA review expectations.

The applicant states that no surveys of nighttime migration will be conducted, because most nighttime migration is above turbine rotor elevation. There are, however, anecdotal records that the area has experienced massive low-level migration of Sandhill crane during storm events. The above referenced CEC Guidelines state: "For nocturnal migratory birds, conduct additional studies as needed if a project potentially poses a risk of collision to migrating songbirds and other species." The study cited in the Use Permit application is not fully instructive as to this possibility for this site. The applicant also states that radar surveys have been discredited as unreliable, but the use of acoustical or near-infrared methods is not discussed. The possibility of low level Sandhill crane migration during storm events should be fully examined, and studies designed to further address this if feasible.

We are concerned about the configuration of the project including widely disparate turbine sites and many improved access roads, and the attendant construction and operation effects that will tend to fracture wildlife habitats. We suggest that consideration of alternate configurations that will concentrate facilities and roads and thus lessen the effects of habitat fragmentation should be considered.

The site plan indicates that 4 or more MET towers will be maintained beyond the construction phase and indefinitely during normal operations. Due to the risk of mortality to birds from MET tower guy

wires, the above referenced CEC Guidelines recommend that permanent MET towers should not be guyed at turbine sites, or if guy wires are necessary, then effective bird deterrents installed.

The application presents a number of milestone dates for surveys and related reports. Wintu Audubon would appreciate knowing the approximate revised schedule status for these milestones.

The above referenced CEC Guidelines call for the identification and consultation with conservation groups (such as Wintu Audubon) in advance of design and implementation of bird and bat studies and surveys. We have not been contacted on this project in the past. Although we appreciate the opportunity to consult at this current "early" stage, we have insufficient information on the design protocols for any of the studies underway on this project to determine their adequacy. We trust that studies can be amended or augmented should the need be identified.

The CEC Guidelines also call for identifying conservation orgs such as Audubon to consult with the developer throughout project planning and CEQA review. Wintu Audubon stands ready to perform this role. We can be available by phone or in person for further consultation as necessary to clarify our position on any of these planned studies and reports, and throughout project planning.

Sincerely,

Bruce Webb

Bruce Webb, phone (530)515-5324 and Janet Wall, phone (530)547-1189
Co-Chairs, Conservation
Wintu Audubon Society

Cc: Wintu Audubon Board of Directors
California Audubon