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June 17, 2021

Shasta County Planning Commission
1855 Placer Street Suite 103
Redding CA 96001

Dear Chairman Wallner and Planning Commission Members,

At the request of ConnectGen, we have completed an independent and objective review of the wildfire risks of the Fountain Wind Project, and we are respectfully submitting this letter to provide our professional opinions regarding those risks and the associated risk mitigation strategies as described in the Fountain Wind Project EIR.

With over 70 years of combined wildland fire suppression and management experience, including involvement in the response to the 1992 Fountain Fire, we believe the fire mitigation strategies, as described in the EIR, are adequate to reduce wildfire risk to a "less than significant" level. No form of energy generation is completely free from risk but the wildfire mitigation strategies and requirements, as described in the EIR are appropriate. Based on our long experience in the field, we believe the Project will in fact increase ground-based firefighters ability to suppress wildfires in this area of the County.

The existing landscape that is the basis for much of the Fountain Wind Project (Project) area consists of a nearly homogenous young pine plantation with very little break in the continuous dense forest canopy and associated understory vegetation and wildland fuels, with limited road access, and compounded with complex topography. These factors pose increased challenges to wildland firefighters who are called upon to contain and suppress wildfires. The Project, with its associated infrastructure including roadways, turbine pads, and other related developments that will be nearly void of wildland vegetation, will serve to break up the continuity of the existing dense vegetation – effectively creating numerous pre-existing fuelbreaks that will provide for increased opportunities to slow and contain the spread of wildfires. Additionally, the associated roadways and travel corridors that will provide access to the turbines and related infrastructure will also serve to greatly increase access throughout the project area for wildfire suppression purposes, therefore decreasing response times for suppressing and containing wildfires. Those same roadways and travel corridors will also provide for safer access routes for firefighters; greatly increase options for firefighters to use roads and other fire spread barriers as anchor points and containment lines for suppressing wildfires; and improve egress routes for occupied inholdings who may need to evacuate due to wildfires or other emergencies. The attached document, *"FWP EIR – Wildfire Effects Review by Darin Quigley and Syndy Zerr"* provides more details regarding our objective opinions and support of the wildfire effects analysis in the EIR, and in summary, the Fountain Wind Project will, in the context of wildfires:

- Increase road access, improving response times to wildfires within or near the Project; provide safer transportation corridors for ground-based firefighting assets.
- Reduce hazardous wildland fuels along existing roadways, providing safer "anchor points" for firefighters to suppress wildfires, and provide pre-made fire containment lines.
- Provide improved egress routes (upgraded and maintained roads) for developed/occupied interior inholdings.
- Provide better access to water sources used in suppressing wildfires; existing roads will be improved, and bridges will be upgraded and widened to support the heavier equipment typically used on wildfires (i.e., fire engines, dozer transports/lowboys, water tenders).
- Reduce hazardous fuels along strategic ridgelines where wildfire suppression can be effective.
- Break up the existing homogenous vegetation, characterized as young pine plantations; breaking up the continuity of this fuel type can also reduce the severity of wildfires, and improve the survivability of young pines.

- Result in an increase in authorized human presence, including patrols during construction and operations phases, for more rapid detection of wildfires. The Project will have a fire coordinator during the construction phase who will be responsible for training all construction personnel how to recognize signs of a fire and the appropriate procedures to safely respond to various fire situations, including notification of the appropriate authorities pursuant to the Fire Prevention Plan.
- The Project will be privately owned and operated and connected to the PG&E transmission system. The full-time operations presence associated with the Project would assist in monitoring all electrical infrastructure in the area, including the PG&E high voltage lines and associated rights-of-ways that bisect the Project Site. If a potential issue is spotted along the PG&E right-of-way the Project's operational personnel can work with the landowner and/or PG&E to immediately address the issue. Therefore, the project will not exacerbate the fire risk present on PG&E's system within proximity to the Project.

We acknowledge that while the Project provides the above listed benefits regarding wildfires, we concur that there will be several additive direct and indirect risks during construction and operation. Although the existing measures in the FEIR are adequate, we have identified an opportunity to further strengthen the measures. These additional measures are listed in the companion technical document.

It has also been noted that in the vicinity of turbines, there will be a reduction in available airspace for fixed-wing firefighting aircraft used to apply fire retardant; and a reduction in available airspace for the use of rotor-wing aircraft used to deliver water/foam/gel/retardants, supplies, and firefighters to wildfires. It is our opinion that aerial firefighting, particularly the use of helicopters, will still be possible in many areas of the Project, and the full suite of aerial firefighting assets, including aair tankers and helicopters, can be effectively used along and within the perimeters of the Project area.

Further, we note that there are alternative methods for retardant application, beyond the use of fixed-wing air tankers, including the use of ground-based retardant application systems, as well as the use of rotor-wing retardant applications where possible, as further explained in the attachment.

Ground-based firefighting assets are very effective at containing and suppressing wildfires. We believe that the primary tool for firefighting within the Project Site will be ground based with the addition of aerial firefighting along the periphery of the Project. The use of aerial assets including airtankers along the periphery of the Project is very reasonable, and there are some opportunities within the Project for the use of fixed- and rotor-wing aircraft as well.

Finally, based on our research and experience, the risk of ignition during turbine operation is low. Modern turbines are designed with the option to add state of the art fire suppression technology within the turbines, as will be required by the County at this project. The technology that will be deployed at the Fountain Wind Project will include both fire detection and fire extinguishing. The fire detection system will be comprised of various smoke detectors distributed across the nacelle and tower base. If an alarm is triggered, the turbine controls will automatically force the turbine to perform an emergency stop while ceasing its ability to create power. The fire extinguishing system that will be deployed within the turbine will be located in the nacelle and would serve to protect the electrical cabinet and switchgear of the turbine. The system includes a gas container and a set of nozzles and hoses that funnels the gas into these electrical cabinets. If the fire detection is triggered the system will release the gas into the electrical cabinets displacing the oxygen confined into that space. Fire events in modern turbines are exceedingly rare. Even without today's technologies, no turbine at the Hatchet Ridge project has ever caught fire. Nor have there been any reports of fire from recently installed turbines in the Tehachapi's, Solano County or Palm Springs.

Our combined years of practical experience in wildland fire suppression and management, and our innumerable hours of related education were relied upon during our objective review of the project and

the conclusions made in the EIR. A synopsis of our experience and qualifications is provided following this letter.

We thank you for the opportunity to provide our perspective on this Project, and we sincerely hope that our review will assist you in the decision-making process. We plan on being present at the upcoming June 22nd hearing and look forward to answering any questions you have.

Darin Quigley

Quigley Consulting LLC

Syndy Zerr

Wildfire Mitigation Network LLC

Enclosure: *FWP EIR – Wildfire Effects Review by Darin Quigley and Syndy Zerr*
cc: Paul Hellman

Darin Quigley Experience

Darin's experience includes 39 years working for CAL FIRE, the Forest Service, local government and the College of the Siskiyous. He is currently the Fire Coordinator for the Northern California Fire Co-op that protects 2.5 million acres of timber lands in northern California, including the underlying lands owned by Shasta Cascades Timberlands, leased to ConnectGen for the Fountain Wind Project. He also currently works in the private sector as a Wildfire Mitigation Specialist developing Wildfire Mitigation Plans on private properties throughout northern California. He has worked as a Fire Chief, Battalion Chief, Fire Captain, Fire Apparatus Engineer, and firefighter throughout northern California. He was responsible for starting the Fire Academy at the College of the Siskiyous and served as their Fire Coordinator for almost two decades. He is qualified as a Type 1 Operations Section Chief and served on CAL FIRE and USFS Incident Management Teams for 20 years as a Safety Officer, Division Supervisor, Branch Director and Operation Section Chief. He was an Operation Section Chief on many Northern California fires including the Boles and Ponderosa fires. He has an AS degree in Fire Science and was a Paramedic. He was recognized as the "2014 Firefighter of the Year" for CAL FIRE. During the 1992 Fountain Fire, Darin was one of the key responders during the initial and extended attack phases of the fire.

Syndy Zerr Experience

Syndy's experience includes over 35 years working for the Forest Service, National Park Service, CAL FIRE, Bureau of Land Management and as a private sector Mitigation Specialist developing Wildfire Mitigation Plans and Strategies. She has worked on Interagency Hotshot Crews, type 1 fire crews, helicopter rappel crews, as a Battalion Chief, Division Chief, and Deputy Chief-Operations. She has also served in Fuels Technician positions and has assisted in the development of several CWPPs and WMPs. Her primary work locations were in northern California, and throughout Oregon, as well as numerous fire and all-hazard assignments all across the country and Puerto Rico. She is currently NWCG qualified as a Type 1 Planning Section Chief (PSC1), Situation Unit Leader, Type 3 Incident Commander, Division/Group Supervisor, Aerial Observer, Task Force Leader, Strike Team Leader (engine and crew), Crew Boss and Engine Boss. Syndy also serves as a Primary PSC1 on a Type 1 National Interagency Incident Management Team (IMT), an alternate PSC1 on an Area Command Team, and frequently supports a local Type 3 IMT in her local community during emerging wildfires. Syndy's education includes an AAS in Forestry (COCC), AAS in Wildland Fire Science (COCC), and she holds a Certificate of Study in Wildland Fire Management (HSU) as well as successfully completed numerous hours of agency provided training in Wildland Fire Suppression, Prescribed Fire, Leadership, Incident Management, Smoke Management, and Risk Management.

Fountain Wind Project EIR
Wildfire Effects Review by Darin Quigley and Syndy Zerr

Opinions of Adequacy of Wildfire Effects Analysis

General comments
Darin Quigley and Syndy Zerr ("Specialists") find that the wildfire mitigation strategies, as described in the EIR, are adequate to reduce the wildfire associated risks of the Fountain Wind Project to a less than significant level. The County's EIR properly considers each potential effect and adequate mitigation strategies were identified. We, nonetheless, offer some additional suggestions to strengthen the existing mitigation measures and provide specific additional language below for the County to consider adopting.

Section 3.16.3.1 Direct and Indirect Effects

Impact 3.16-1: ***"The Project would, unless mitigated, substantially impair an adopted emergency response plan or emergency evacuation plan. (Less than Significant with Mitigation Incorporated)"***

Mitigation Measure 3.16-1a: *"Implement Mitigation Measure 3.14-3 (Traffic Management Plan) (DEIR, page 3.16-15).*

Mitigation Measure 3.14-3: Traffic Management Plan:
Prior to the issuance of construction or building permits and prior to the removal of materials from the Project Site during decommissioning, the Applicant shall:

1. *Prepare and submit a Traffic Control Plan to Shasta County Public Works Department and the Caltrans offices for District 2, as appropriate, for approval. The Traffic Control Plan must be prepared in accordance with both the Caltrans Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook and must include, but not be limited to, the following:*
    a. *A plan for communicating construction/decommissioning plans with Caltrans, emergency service providers, and residents located in the vicinity of the Project Site.*
    b. *An access and circulation plan for use by emergency vehicles when lane closures and/or detours are in effect. If lane closures occur, provide advance notice to local fire departments and sheriff's department to ensure that alternative evacuation and emergency routes are designed to maintain response times.*
    c. *Timing of deliveries to/removals from the Project Site of heavy equipment and building materials;*
    d. *Directing vehicles, pedestrians, and bicyclists on SR 299 through the construction zone with a flag person;*
    e. *Providing detours to route vehicular traffic, bicyclists, and pedestrians around lane or shoulder closures, if they occur;*
    f. *Providing adequate parking for construction trucks, equipment, and workers in the designated staging areas within the Project Site;*
    g. *Placing temporary signage, lighting, and traffic control devices if required, including, but not limited to, appropriate signage along access routes to indicate the presence of heavy vehicles and construction/decommissioning traffic, and the placement of traffic cones to provide temporary left-turn lanes into Project driveways as needed;*
    h. *Preserving access to existing ingress/egress points for all adjacent property at all times; and,*

i. *Specifying both construction/decommissioning-related vehicle travel and oversize/overweight vehicle haul routes.*

2. *Obtain all necessary encroachment permits for the work within the road right-of-way or use of oversized/overweight vehicles that will utilize County-maintained roads, which may require California Highway Patrol or a pilot car escort. Copies of the approved traffic plan and issued permits shall be submitted to the Shasta County Public Works Department and Caltrans.*
3. *Consult with the Shasta County Public Works Department and Caltrans to identify any substantial construction activities on SR 299 that may overlap with construction of the Project (e.g., Caltrans SR 299 resurfacing project from Milepost 60.0 to 67.8). Coordinate with the contractor(s) of any identified project(s) to ensure that overlapping construction activities do not cause unnecessary delays on SR 299 or preclude the ability of large vehicles to access the Project Site."*

Significance after Mitigation: *"Less than significant."*

Specialist's Conclusions: The Specialists concur that implementing the identified mitigation as described, together with other identified mitigation measures, will result in a less than significant wildfire effect. See additional comments below.

Additional comments from Specialists:

- As noted in the DEIR, additional, well-maintained primary roads accessing the project area as well as secondary roads interior to the project area would enhance response capacity and reduce response times for initial attack (IA) fire suppression strategies and tactics for areas within the project site. Those same roads would be logical, pre-made, strategic wildfire control lines that could be used for fire containment purposes, including as anchor points for direct and indirect fireline construction, and as control lines for strategic firing operations for offensive fire suppression tactics. Those same pre- made and well-maintained roads could also be utilized as control lines for implementing light understory prescribed burning if that becomes a desired future forest management option. Additionally, with the increased maintenance of existing interior roads, access and egress to the inholdings such as Dogwood Acres, Henrich, Forster, Lammers, etc., would be enhanced, providing for improved escape route opportunities and access for emergency responders.

Mitigation Measure 3.16-1b: *"Pre-Construction Coordination with CAL FIRE (DEIR, page 3.16-16).*
Prior to construction, the Applicant shall provide GIS files or other maps of the Project layout to CAL FIRE to facilitate aerial fire-fighting planning. The Applicant shall notify CAL FIRE of any changes to the Project layout or any maintenance that would require the use of helicopters or the use of equipment not previously identified on maps provided to CAL FIRE that could present a new, previously unidentified vertical obstacle to aerial firefighting."

Significance after Mitigation: *"With implementation of Mitigation Measure 3.16-1b, CAL FIRE would have the information necessary to plan for aerial firefighting with the Project in place. This would allow CAL FIRE to identify locations for retardant or water drops within the Project Site and would allow for the planning of flight plans around the Project Site. With the implementation of Mitigation Measure 3.16-1b, impacts would be reduced to a less-than-significant level.*

Specialist's Conclusions: The specialists concur that, with the identified mitigations as described, together with the other identified mitigation measures that the wildfire risks of the Project would be reduced to a less than significant level. For clarity, and as a tool to further communicate the validity and importance of this mitigation measure, see rationale below.

Additional comments from Specialists:

- Aerial firefighting includes both fixed-wing (which includes air tankers, lead planes, and Aerial Supervision Module platforms) and rotor-wing (helicopters) for initial attack, extended attack, and large fire suppression operations. The application of fire-retardant materials, most typically PHOS-CHEK, can be accomplished with both air tankers and helicopters. Helicopters, supported by Mobile Retardant Bases (MTB) supplied with PHOS-CHEK, which are essentially temporary dip tanks filled with the same retardant used by airtankers, where the retardant is mixed onsite and near the wildfire and used to fill helicopter tanks or buckets, can apply retardant in areas when airtankers are either not available, or unable to fly due to hazards in their flight path that decrease the safety of flight traffic patterns. Each aerial asset, fixed-wing and helicopter, have uses applicable to applying aerially delivered fire retardant.
- The application of fire retardants (PHOS-CHEK, FIRE-TROL, foam/water mixes, gels) typically utilized with airtankers and helicopters, can also be applied using ground-based equipment such as water tenders and engines and this application is not limited to day-time hours as is generally the case with aerially applied retardants. Where aerially delivered retardants are limited by aerial hazards including wind turbines, or lack of daylight and/or VFR flight conditions, ground-applied retardants are an alternative and may also be a superior option.
- During the Specialists' visit to various areas of the project site, an optical simulation was conducted to visualize the tactical application of airtankers and retardant between rows of wind turbines and the Specialists concur that retardant application using both fixed-wing and rotor wing aircraft is practical in several areas of the project site with proper aerial supervision, aerial hazard identification maps, and appropriate pilot briefings.
- Airspace hazards such as wind turbines are pre-identified on sectional aeronautical charts, both paper and electronically on georeferenced electronic maps. The FAA updates aeronautical charts on a regular basis, and when known changes occur prior to chart updates the FAA will issue a Notice to Airmen (NOTAM) to alert pilots of new aerial hazards.
- Aviation hazards maps are also developed by land management and firefighting agencies to identify those known hazards that are either not identified on FAA supplied aeronautical charts; or, to further highlight hazards that may be of greater importance to firefighting pilots; agency aerial hazard maps may include cable crossings, towers including MET towers and wind turbines, and low power lines. Agency produced aerial hazard maps are reviewed annually, or more often as needed.
- During wildfire incidents that extend beyond the initial attack phase, fire-specific aerial operations maps ('Air Ops' maps) are typically developed and provided in georeferenced electronic and paper formats. These incident-specific maps provide greater detail on known aerial hazards in addition to tactical information that improves pilot situational awareness (dip sites, mobile retardant bases, helispots, helibases, etc). These same maps are also utilized for briefing pilots and support crews who are assigned to engage in specific missions in or near the fire area and the associated aerial hazards in the mission area.
- Note that modern mapping of aerial hazards, including those produced by land management agencies, incident management teams, and FAA, are available and widely used by pilots in georeferenced electronic format on electronic devices such as tablets and mobile phones which aids in pilot navigation and hazard identification.

Impact 3.16-2: ***"The Project would, unless mitigated, exacerbate wildfire risks and expose people to pollutant concentrations or a significant risk of loss, injury or death from a wildfire or the uncontrolled spread of a wildfire. (Less than Significant with Mitigation Incorporated)"***

Mitigation Measure 3.16-2a: *"Fire Safety" (DEIR, pages 3.16-19 through 3.16-21).*

The Applicant and/or its contractors shall prepare and implement a Project-specific Fire Prevention Plan (FPP) to prevent an exacerbation of wildfire risk during both the Project construction and operation and maintenance phases. Prior to construction, the Applicant shall contact and consult with the Shasta Trinity Unit of CAL FIRE and the Shasta County Fire Department to determine the appropriate amounts of fire equipment to be carried on the vehicles and appropriate prevention measures to be taken. The Applicant shall submit verification of its consultation with the appropriate fire departments to Shasta County. The Applicant shall submit a draft FPP to the Shasta County Project Manager for approval when the building permit application is submitted. The County shall have an opportunity to make comments on and revisions to the FPP, which the Applicant shall incorporate into a revised FPP for approval. The Applicant shall make the approved FPP available to all construction crew members prior to construction of the Project. The FPP shall list fire safety measures including fire prevention and extinguishment procedures, as well as specific emergency response and evacuation measures that would be followed during emergency situations; examples are listed below. The FPP also shall provide fire-related rules for smoking, storage and parking areas, usage of spark arrestors on construction equipment, and fire-suppression tools and equipment. The FPP shall include or require, but not be limited to, the following:

- *Prior to construction, the Project applicant shall designate primary and alternate Fire Coordinators such that a Fire Coordinator is present at all times during Project construction. The Fire Coordinator shall be responsible for ensuring that crews have sufficient fire suppression equipment, communication equipment, shall lead and coordinate fire patrols, ensure that the required clearances are followed onsite, and ensure that all crew members receive training on the FPP and its components.*
- *For vehicles within control of the contractor, the contractor shall require vehicle drivers to conduct a visual inspection of the vehicle for potential sparking risks prior to operation of the vehicle. This inspection should include, but not be limited to a check of tire pressure and an inspection for chains or other vehicle components that could drag while driving. For subcontractors or vendors where vehicles are not within the control of the contractor, the contractor or Applicant shall develop a standard brochure to send to vendors that shall provide educational materials about fire risks associated with vehicles and shall provide an inspection checklist.*
- *The Applicant and/or its contractors shall have water tanks, water trucks, or portable water backpacks (where space or access for a water truck or water tank is limited) sited/available in the study area for fire protection.*
- *During construction of the Project the Applicant and/or its contractors shall implement ongoing fire patrols during construction hours and for 1 hour after the end of daily construction and hotwork.*
- *All construction crews and inspectors shall be provided with radio and/or cellular telephone access that is operational within the Project Site to allow communications with other vehicles and construction crews. All fires shall be reported immediately upon detection.*
- *Require that all internal combustion engines, stationary and mobile, be equipped with spark arresters in good working order.*
- *Require that light trucks and cars with factory-installed mufflers be used only on roads where the roadway is cleared of vegetation.*

- *Require that equipment parking areas and small stationary engine sites are cleared of all extraneous flammable material.*
- *Include a fire conditions monitoring program to monitor meteorological data during construction and operation.*
- *Include a monitoring and inspection protocol for turbines and electrical infrastructure.*
- *Include protocol for disabling re-closers and de-energizing portions of the electrical collection and transmission systems*
- *Prohibit smoking in wildland areas, with smoking limited to paved areas or areas cleared of all vegetation.*
- *All construction vehicles shall have fire suppression equipment.*
- *The Applicant shall ensure that all construction workers receive training on the implementation of the FPP including how to conduct a fire patrol, proper use of fire-fighting equipment and procedures to be followed in the event of a fire, vegetation clearance and equipment usage requirements, turbine, and electrical equipment inspections.*
- *As construction may occur simultaneously at several locations, each construction site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires.*
- *The Applicant shall enforce a requirement that construction personnel park any vehicles within roads, road shoulders, graveled areas, and/or cleared areas (i.e., away from dry vegetation) wherever such surfaces are present at the construction site.*
- *The Applicant and its contractor shall cease all non-emergency work during Red Flag Warning events.*
- *The Applicant shall coordinate the finalization of road improvements (i.e. frequency of grading and vegetation clearance) with CAL FIRE and other emergency responders to ensure that sufficient ingress and egress exists onsite.*
- *Prior to the initiation of construction, a designated inspector from the County shall inspect the Project Site to ensure that sufficient fire suppression equipment is present onsite, that the required vegetation clearances have been cleared, that a crew member training program has been created, that construction vehicles are equipped with fire suppression equipment, that spark arrestors are installed on construction equipment, that a fire conditions monitoring program has been developed, that a monitoring and inspection protocol has been developed, that a disabling and re-closing protocol has been developed, and that CAL FIRE was appropriately consulted regarding road improvements and ingress and egress.*
- *During construction, the Applicant shall submit a weekly FPP compliance report that demonstrates the following: fire patrols have been conducted following construction, any new construction workers have received training on the implementation of the FPP, that non-emergency work is being halted appropriately during Red Flag Warnings, and that sufficient fire suppression equipment is present onsite.*

Successful implementation of Mitigation Measure 3.16-2a (Fire Safety) would be demonstrated by the development of an FPP in consultation with local fire authorities which is documented and submitted to Shasta County for review, any revisions, and final approval. Additionally, successful implementation of Mitigation Measure 3.16-2a would require that the Applicant and its contractor comply with all components of the FPP, that ignition from Project construction activities is promptly reported to the fire department(s) with jurisdiction, and that when it is safe to do so, any Project-caused ignition is suppressed immediately."

Specialist's Conclusions: **The specialists concur that, with the identified mitigations as described, together with the other identified mitigation measures that the wildfire risks of the Project would be reduced to a less than significant level.**

Additional comments and recommended refinements of existing mitigation measure from Specialists:

- As evidenced by past fire history in the vicinity of the project area including the Fountain Fire, the prevailing wind direction is south-southwest; ignitions (natural and human-caused) that occur in the project area will likely cause fire spread in a north-north easterly direction away from communities located west of the project area, but towards areas such as Shasta Cascades Timberlands.
- As noted above in mitigation measure 3.16-1b, the use of fire retardants such as PHOS-CHEK and FIRE-TROL, other foam/water mixes, and gels, such as typically utilized with airtankers and helicopters, can also be applied using ground-based equipment such as water tenders and engines and this application is not limited to day-time hours as is generally the case with aerially applied retardants. Where aerially delivered retardants are limited by aerial hazards including wind turbines, or lack of daylight and/or IFR flight conditions, ground-applied retardants are an alternative and may also be a superior option.
- The majority of the existing (pre-construction) vegetative conditions include a mostly homogeneous stand of young pine planted after the Fountain Fire. The addition of roads and wide vegetation-free or mostly free turbine pads scattered across the project area will serve to break up the continuity of the fuels -- this can be very advantageous during fire suppression operations.
- Additionally, the landowner of the leased lands associated with the project has and plans to continue creating roadside shaded fuelbreaks (thinning in existing pine plantations) along primary road systems. Shaded fuelbreaks are advantageous for fire suppression purposes and provide safer fire control lines and access for firefighters.

The following refinements are offered to further strengthen Measure 3-16.2a:

- The Fire Prevention Plan (FPP) shall require that all construction vehicles, including vehicles transporting supplies and materials, and any O&M related vehicles, are regularly inspected to minimize vehicle fire hazards.
- The FPP shall include provisions for fire prevention and fire control/suppression when using tracked equipment such as dozers, excavators, cranes, etc., that will be working near vegetation that may be ignited by sparks associated with metal tracks and natural surfaces (i.e., rock).
- If emergency work needs to be undertaken during Red Flag Warning conditions, the FPP shall advise that extreme caution must be taken and prophylactic measures shall be taken such as application of ground-based fire retardants/gels/foams on nearby (within 30 feet, or more depending on the type of 'emergency work') vegetation or other flammables.
- The FPP shall specify when use of public roadways by construction related vehicles, including those traversed by the public near the project site, will be limited or ceased due to critical fire weather (CFW) periods and when Red Flag Warnings (RFW) have been issued, with an objective of ensuring there will not be a significant impact to any emergency response plans or emergency evacuation plans.
- The FPP shall use industry-approved fire behavior and fire spread modeling such as 'FlamMap' to develop thresholds and triggers for certain activities, including curtailment of construction-related activities that increase risk of ignition (e.g., blasting, grinding, welding, cutting, excavating, driving, etc.) The models will provide parameters based on temperature, wind speed, topography, fuel types, fuel moisture and relative humidity to establish work stoppage guidance.
- The FPP shall contain measures to ensure that any burned area emergency response ("BAER") measures meet CAL FIRE standards.
- The FPP shall require that hazardous fuels (e.g., wildland vegetation) near any powerlines or related systems shall be removed and maintained as needed upon inspection; inspections should occur annually.

Mitigation Measure 3.16-2b: *"Nacelle Fire Risk Reduction (DEIR, pages 3.16-21 through 3.16-22).*

Turbines shall be equipped with fire detection and prevention technology compatible with the manufacturer's operating requirements and will be maintained in good working order throughout the life of the Project. Turbines with electrical equipment in the nacelle shall have safety devices to detect electrical arc and smoke that use the best available technology for fire detection and suppression within turbines. The turbine design shall include the following components:

1. *Early fire detection and warning systems;*
2. *Automatic switch-off and complete disconnection from the power supply system; and*
3. *Automatic fire extinguishing systems in the nacelle of each wind turbine.*
4. *Additionally, turbines shall include lightning protection equipment such as grounding equipment, and a lightning measurement system. Lightning grounding systems shall consider site-specific conditions such as soil type and conductivity.*

Should any of these devices report an out-of-range condition, the device shall command a shutdown of the turbine and disengage it from the electrical collection system, and send a notice through the SCADA. The entire turbine shall be protected by current-limiting switchgear installed at the base of the tower.

In the event of a lightning strike, an electrical inspection shall be conducted on the affected turbine to identify and address any damage to the turbine or electrical system that could result in subsequent fire risk."

Specialist's Conclusions: The specialists concur that, with the identified mitigations as described, together with the other identified mitigation measures that the wildfire risks of the Project would be reduced to a less than significant level.

Additional comments from Specialists:

- With the required mitigation measure of a functional fire Suppression system in all nacelles combined with the development and implementation of the required Fire Prevention Plan before start of construction the Specialists believe the wildfire risks are less than significant.
- The Specialists also believe that with the reduction of fuels along project roadways and windmill sites within the project area will significantly reduce the wildfire risk within the project area. The project roads and windmill sites will serve as fuel reduction areas and provide a benefit to the remaining timber production area by providing quicker access to firefighting equipment during lightning fires. The new roads will also provide areas for wildland firefighters to anchor and flank wildfires providing for easier ground-based containment actions. The road widths will be widened to include a 20-foot-wide all-weather surface which will provide better access to all wildfire equipment including dozers. Firefighting equipment access speeds will also be increased due to the new road surfaces in the project area. Being able to access a fire within the project area quickly during Initial Attack will minimize future large fires due to lightning or human caused fires.

Mitigation Measure 3.16-2c: *"Emergency Response Plan" (DEIR, page 3.16-22)*

Prior to the submission of the building permit application, the Applicant shall prepare an emergency response plan to be reviewed and approved by Shasta County Planning, CAL FIRE, and the Shasta County Fire Department. Following approval of the plan, the Applicant and/or its contractors shall implement the requirements in the plan during all phases of construction and operation, as applicable. The emergency response plan shall describe the likely types of potential accidents or emergencies involving fire that could occur during both construction and operation, and shall include response protocols for each scenario. The plan shall include key contact information and a description of key processes, in the event of an emergency in order to alert relevant responders of the emergency, and how to control the emergency. The plan shall include

crew member training in response, suppression, and evacuation. The training shall be coordinated by the designated Fire Coordinators. Prior to construction, the Applicant shall submit to the County a compliance report demonstrating that all crew members have been trained. As new construction crews or operation workers are brought onsite, the Applicant shall submit additional compliance reports demonstrating that they have been received training on the emergency response plan."

Significance after Mitigation: *"Implementation of Mitigation Measure 3.16-2a (Fire Safety), Mitigation Measure 3.16-2b (Nacelle Fire Risk Reduction), and Mitigation Measure 3.16-2c (Emergency Response Plan) would require the Applicant and its contractors to implement fire safety measures to prevent fire and be prepared to respond immediately if a fire should ignite, and would require collaboration with area fire protection agencies to reduce the risk of wildfire ignition and spread. This impact would be reduced to a less-than-significant level."*

Specialist's Conclusions: The specialists concur that, with the identified mitigations as described, together with the other identified mitigation measures that the wildfire risks of the Project would be reduced to a less than significant level. Additional measures to further strengthen the mitigation measures are suggested below.

Additional comments and suggestions from Specialists to add to Mitigation Measure 3.16-2c:

- The Emergency Response Plan shall be updated annually to incorporate changes to key contacts including names and contact information, as well as new information regarding emergency response associated with wind turbines and/or Best Management Practices.

Impact 3.16-3: ***"The Project would require the installation and maintenance of Project-related infrastructure (such as roads and power lines) that may exacerbate fire risk, and the installation and maintenance of fire suppression infrastructure (such as vegetation clearances and emergency water sources) that may result in temporary or ongoing impacts to the environment. (Less-than-Significant Impact)"***

Mitigation Measure: *"None required." (DEIR, page 3.16-23)*

Specialist's Conclusions: The specialists concur that, with the identified mitigations as described, together with the other identified mitigation measures that the cumulative wildfire risks of the Project would be reduced to a less than significant level.

Additional comments and suggestions from Specialists:

- It is noted that except in areas where there are significant slope constraints or where cultural resources are to be avoided, collection lines will be constructed underground thus reducing fire risk; power-related support systems (e.g., transformers) should also be housed within the turbine, or fully fenced off and clear of flammable vegetation.

Impact 3.16-4: ***"The Project would, unless mitigated, expose people or structures to significant risks, including adverse water quality effects or downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. (Less than Significant with Mitigation Incorporated)"***

Mitigation Measure 3.16-4: *"Implement the Fire Safety measures that would be required by Mitigation Measure 3.16-2a; implement the Nacelle Fire Risk Reduction measures that would be required by Mitigation Measure 3.16-2b; and implement the Emergency Response Plan that would be required by Mitigation Measure 3.16-2c." (DEIR, page 3.16-24)*

Significance after Mitigation: *"With implementation of these measures, the risk of flooding, mudslides, and slope instability associated with post-fire conditions would be addressed with a detailed Fire Prevention Plan, fire risk reduction measures in turbines, and an emergency response plan. Therefore, this impact would be less than significant."*

Specialist's Conclusions: The specialists concur that, with the identified mitigations as described, together with the other identified mitigation measures that the wildfire risks of the Project would be reduced to a less than significant level.

Additional rationale and suggestions from Specialists:

- Agencies, post-fire, should a fire with enough size and severity that warrants it to occur, typically complete a 'Burned Area Emergency Response' (BAER) report or equivalent that identifies measures to be taken to limit the potential for post-fire erosion of soils and potentially contaminants during rain and surface water run-off events (due to wildfire-related vegetation removal). The FPP shall ensure that burned area emergency response measures are addressed and consultation with CAL FIRE occurs. standards.
- With the requirement for a Nacelle fire suppression system, fire risk is lessened.
- The Hatchet Wind Project has not experienced any fires since it was installed in 2010 as noted by the Shasta County Emergency Communications Center data.

Section 2.16.4 Cumulative Analysis

Specialist's Conclusions: The Specialists reviewed the Cumulative Analysis and concurred with the EIR, impacts would be less than significant.

Conclusions and Recommendations Summary

After thorough review, Darin Quigley and Syndy Zerr find that the wildfire mitigation strategies, as described in the EIR, and elsewhere in the record, are adequate to reduce the Project's wildfire risk to a less than significant level. To further strengthen these measures, and further enhance wildfire safety of the project, we suggest that County include the following additional measures:

- The Fire Prevention Plan (FPP) shall require that all construction vehicles, including vehicles transporting supplies and materials, and any O&M related vehicles, are regularly inspected to minimize vehicle fire hazards.
- The FPP shall include provisions for fire prevention and fire control/suppression when using tracked equipment such as dozers, excavators, cranes, etc., that will be working near vegetation that may be ignited by sparks associated with metal tracks and natural surfaces (i.e., rock).
- If emergency work needs to be undertaken during Red Flag Warning conditions, the FPP shall advise that extreme caution must be taken and prophylactic measures shall be taken such as application of ground-based fire retardants/gels/foams on nearby (within 30 feet, or more depending on the type of 'emergency work') vegetation or other flammables.
- The FPP shall specify when use of public roadways used by construction-related vehicles and equipment, including those roadways normally traversed by public near the project site, will be limited or ceased due to critical fire weather (CFW) periods and when Red Flag Warnings (RFW) have been issued, with an objective of ensuring there will not be a significant impact to any emergency response plans or emergency evacuation plans.
- The FPP shall use industry-approved fire behavior and fire spread modeling such as FlamMap to develop thresholds and triggers for certain activities, including curtailment of construction-related activities that increase risk of ignition (e.g., blasting, grinding, welding,

cutting, excavating, driving, etc.) The models will provide parameters based on temperature, wind speed, topography, fuel types, fuel moisture and relative humidity to establish work stoppage guidance.

- The FPP shall address the need for burned area emergency response measures to be analyzed and addressed by CAL FIRE (or agency with jurisdiction).
- The FPP shall require that hazardous fuels (e.g., wildland vegetation) near any powerlines or related systems shall be removed and maintained as needed upon inspection; inspections should occur annually.
- The Emergency Response Plan shall be updated annually or as needed to incorporate changes to key contacts including names and contact information, as well as new information regarding emergency response associated with wind turbines and/or Best Management Practices.