CALIFORNIA PUBLIC UTILITIES COMMISSION
Safety and Enforcement Division
Electric Safety and Reliability Branch

Incident Investigation Report

Report Date: April 30, 2019

Incident Number: E20171016-01

Utility: Pacific Gas and Electric Company (PG&E)

Date and Time of the Incident: October 8, 2017, 2218 hours

Location of the Incident: 1210 Nuns Canyon Road
Glen Ellen, CA 95442
County: Sonoma

Fatality / Injury: Three fatalities in merged Nuns Fire

Property Damage: $179 million (PG&E restoration costs in Sonoma Division)

Utility Facilities Involved: Dunbar-1101, Secondary conductors

Violation: Yes

I. Summary

On October 8, 2017 at approximately 2218 hours, a branch from an Alder tree fell and contacted overhead, secondary voltage conductors of PG&E's Dunbar-1101 circuit supplying power to 1210 Nuns Canyon Road in the city of Glen Ellen in Sonoma County. As a result, PG&E's secondary (120/240 V) conductors failed and fell to the ground, thus igniting the Nuns Fire.

The Nuns Fire was combined with several other fires, which were called collectively the Nuns[1] Fire. The merged Nuns Fire burned 56,556 acres, destroyed 1,355 buildings, and damaged 172 buildings. Three fatalities occurred as a result of the Nuns Fire, with one

[1] The Nuns Fire included the Nuns, Oakmont/Pythian, Norrbom, Adobe, Pressley and Partrick fires. SED investigated each of these incidents except the Pressley fire, which was a spot fire that ignited from an ember that originated from the Adobe Fire

of those fatalities occurring within the perimeter of the Adobe Fire. SED does not know the locations of the other two other fatalities.

Based on SED's review, SED found that PG&E violated the Commission's General Order (GO) 95, Rule 35:

GO Rule	Violations
GO 95, Rule 35	Improper prioritization and delay in abating vegetation strain on secondary service conductor

A. Rules Violated

General Order 95, Rule 35 – Vegetation Management

"Where overhead conductors traverse trees and vegetation, safety and reliability of service demand that certain vegetation management activities be performed in order to establish necessary and reasonable clearances, the minimum clearances set forth in Table 1, Cases 13 and 14, measured between line conductors and vegetation under normal conditions, shall be maintained. (Also see Appendix E for tree trimming guidelines.) These requirements apply to all overhead electrical supply and communication facilities that are covered by this General Order, including facilities on lands owned and maintained by California state and local agencies.

When a supply or communication company has actual knowledge, obtained either through normal operating practices or notification to the company, that dead, rotten or diseased trees or dead, rotten or diseased portions of otherwise healthy trees overhang or lean toward and may fall into a span of supply or communication lines, said trees or portions thereof should be removed.

Communication and electric supply circuits, energized at 750 volts or less, including their service drops, should be kept clear of vegetation in new construction and when circuits are reconstructed or repaired, whenever practicable. When a supply or communication company has actual knowledge, obtained either through normal operating practices or notification to the company, that its circuit energized at 750 volts or less shows strain or evidences abrasion from vegetation contact, the condition shall be corrected by reducing conductor tension, rearranging or replacing the conductor, pruning the vegetation, or placing mechanical protection on the conductor(s). For the purpose of this rule, abrasion is defined as damage to the insulation resulting from the friction between the vegetation and conductor. Scuffing or polishing of the insulation or covering is not considered abrasion. Strain on a conductor is present when vegetation contact significantly compromises the structural integrity of supply or communication facilities. Contact between vegetation and conductors, in and of itself, does not constitute a nonconformance with the rule."

B. Witness(es)

	Name	Title
1	Raymond Cho	CPUC Sr. Utilities Engineer
2	Wilson Tsai	CPUC Utilities Engineer
3	Ryan Yamamoto	CPUC Sr. Utilities Engineer
4	Kyle Steis	Fire Captain, California Department of Forestry and Fire Protection (CAL FIRE)
5	Jay Singh	PG&E Director
6	[redacted]	PG&E Supervisor
7	Maria Deluca	PG&E Claims Investigator
8	[redacted]	PG&E Vegetation Management Supervisor
9	[redacted]	Certified Forester, Washington Forestry Consultants, Inc. (PG&E Contractor)
10	[redacted]	Parker Fire Services Consulting

C. Evidence

No.	Source	Description
1	PG&E	Initial Online Incident Report 10/16/17
2	CPUC	Field visit #1, 10/16/17
3	PG&E	20-day Incident Report, 11/13/17
4	CPUC	Data Request #1, 11/21/17
5	CPUC	Field visit #2, 11/21/17
6	PG&E	Data Request Response #1, 12/29/17 through 6/29/18
7	CAL FIRE	Investigation Report and Attachments, 5/30/18
8	CPUC	PG&E Evidence Inspection, 6/11/18
9	CPUC	Data Request #2,7/19/18
10	PG&E	Data Request Response #2, 8/3/18 through 9/21/18
11	CPUC	Data Request #3, 8/16/18
12	PG&E	Data Request Response #3, 8/31/18 through 9/21/18
13	CPUC	CAL FIRE Evidence Viewing Photos, 10/12/18
14	CPUC	Data Request #4, 10/19/18
15	PG&E	Data Request Response #4, 11/15/18 through 12/14/18
16	CPUC	Data Request #5, 1/3/19
17	PG&E	Data Request Response #5, 1/25/19 through 2/6/19
18	CPUC	Data Request #6, 2/8/19
19	PG&E	Data Request Response #6, 2/15/19 through 3/18/19
20	CPUC	Data Request #7, 2/25/19
21	PG&E	Data Request #7 Response, 3/18/19

II. Background

On January 17, 2014, Governor Edmund G. Brown Jr. proclaimed a State of Emergency and directed state officials to take actions to mitigate conditions that could result from the drought and cause a fire. On February 18, 2014, in response to the proclamation, SED issued a letter to PG&E directing PG&E to take all practicable measures to reduce the likelihood of fires caused by utility facilities, including, increasing inspections, taking corrective actions and modifying protective schemes. On June 12, 2014, the California Public Utilities Commission (CPUC) issued Resolution ESRB-4 directing all Investor Owned Electric Utilities (IOU) to take remedial measures to reduce the likelihood of fires started by or threatening utility facilities. On October 30, 2015, Governor Edmund G. Brown Jr. declared a Tree Mortality State of Emergency due to tree mortality caused by the state's prolonged drought and bark beetle infestations.

On October 8, 2017 at approximately 2218 hours, a branch from an Alder tree fell and contacted overhead, secondary voltage conductors of PG&E's Dunbar-1101 circuit supplying power to the subject property. At this first location identified by CAL FIRE, referred to as Nuns 1 in this report, the secondary conductors failed and fell to the ground as a result.

CAL FIRE also identified a second potential ignition location north of 1210 Nuns Canyon Rd., referred to as Nuns 2 in this report, where the CAL FIRE investigator identified an Oak tree limb suspended on a utility line. However, after reviewing a CAL FIRE Forestry Assistant's report and photographs, SED determined the limb was actually a California Bay Laurel tree limb suspended by an overhead communication cable. Regardless of the species of the tree limb, CAL FIRE investigators deemed that the tree failed after the fire passed through the location and that this was not the origin of the Nuns fire[2]. Therefore, this report primarily focuses on the span upon which the Alder branch fell.

The Nuns fire contributed to power interruptions to 3,072 customers on the Dunbar-1101 circuit for a maximum outage duration of 23,705 minutes. PG&E reported an estimated $179 million in restoration costs for its facilities in Sonoma Division.

Remote weather station KENWW Kenwood-Kunde is located approximately 1.6 miles northwest from the incident location. At 2300 hours, the station recorded a wind speed and gust of 17.1 miles per hour (mph) and 45.7 mph, respectively. The ambient condition at 2300 hours was approximately 72.1 degrees Fahrenheit with a 12 percent relative humidity. [3]

[2] 17CALNU010049 CAL FIRE Nuns Investigation Report.

[3] Weather conditions on October 13, 2017 per MesoWest (www.mesowest.utah.edu)

Figure 1. Red marker: approximate ignition point/location (38.394133, -122.516283) near 1210 Nuns Canyon Road. (Source: Google Maps)

III. SED Review and Analysis

A. PG&E's Distribution Facilities Inspection Program

General Order 165 requires biennial patrol inspections and detailed inspections at five-year intervals for rural areas, such as the incident location. Rural areas are defined by GO 165 as "those areas with a population of less than 1,000 persons per square mile".

GO 165 defines a patrol inspection as a "simple visual inspection" meant to identify "obvious" problems and hazards and may be carried out in the course of other company business. GO 165 defines a detailed inspection as one where facilities are "carefully examined" to gather and record conditions of overhead facilities.

For the incident areas, SED reviewed PG&E's 2014 and 2016 distribution patrol inspection and PG&E's 2012 and 2017 detailed inspection documentation. No conditions or issues were documented during the course of PG&E's patrol inspections in 2014 and 2016.

As a result of the 2012 detailed inspection, PG&E created two work orders (#106240932 and #106240939); one work order was related to replacing a damaged anchor and the second work order related to replacing a split crossarm. PG&E

completed #106240932 (anchor replacement) on October 5, 2013 and notification #106240939 (crossarm replacement) on November 13, 2012; both work orders were completed on or before PG&E scheduled due dates.

After reviewing PG&E's 2017 detailed inspection records, SED identified three work orders of interest:

1. Work order #113271607[4] – PG&E identified a failed tree leaning on a service conductor on September 22, 2017. The comments for the work order note "(b)ig tree fell over on to sec wire mid span between last to (sic) svc poles, lots of strain on 1 phase"[5]. On October 5, 2017, PG&E planned to de-energize the conductors for the tree removal. The PG&E inspector prioritized the tree to line contact as Priority B and scheduled a due date of December 22, 2017. However, in SED's opinion, the tree leaning on and putting "lots of strain" on the conductor was an immediate safety hazard that required immediate attention due to the potential fire risk. Ultimately, PG&E cancelled the work order after the fire since the surrounding environment changed because of the fire.
2. Work order #113266538 – PG&E identified woodpecker holes just below the crossarm and a missing high voltage sign on September 21, 2017. The PG&E inspector prescribed to fill the holes and prioritized the repair as Priority E due by September 21, 2018.
3. Work order #113271327 – PG&E identified woodpecker holes and a missing high voltage sign on September 22, 2017. The PG&E inspector prioritized the pole replacement as priority E due by September 22, 2018.

Based on the SED's review of GO 165 inspection records, SED found PG&E in violation of GO 95, Rule 35 for allowing a tree to contact and strain a secondary conductor and for improperly prioritizing the vegetation work related to work order #113271607 to correct the safety hazard. Rule 35 explains that, "Strain on a conductor is present when vegetation contact significantly compromises the structural integrity of supply or communications facilities." Although this violation did not directly contribute to the ignition of the Nuns fire, the violation identifies an unsafe practice by PG&E.

B. PG&E's Vegetation Management Program

The GO 95 rules applicable to Vegetation Management (VM) include:

1. Rule 31.1 – Design Construction and Maintenance.
2. Rule 35 – Vegetation Management.

[4] Bates PGE-CPUC_00008687_CONFIDENTIAL.

[5] Id.

3. Rule 37 – Minimum Clearances of Wires above Railroads, Thoroughfares, Buildings, Etc., Table 1 – Cases 13 and 14.

In order to comply with the applicable GO 95 rules, PG&E's Distribution Vegetation Management Standard[6] (DVMS) outlines the general strategy used to identify:

1. Conductor radial clearance issues;
2. Trees that will encroach PG&E's minimum distance requirements; and
3. Hazard trees that have the potential to strike conductors.

In order to implement their strategy, PG&E's DVMS prescribes annual vegetation patrols and completion of identified tree work for all primary and secondary distribution facilities.

i. Routine VM Inspections

PG&E's VM contractors, specifically Pre-Inspection[7] (PI) personnel, work with VM Vegetation Program Managers (VPM) to create an annual plan for routine patrols that lead to vegetation work. Vegetation work prescribed by the PI personnel is completed by Tree Contractor (TC) personnel. PG&E also uses a combination of LiDAR[8] and spectral imagery to allow VM personnel to identify hazardous trees in high fire threat areas. Trees identified using these technologies are then inspected from the ground and addressed as necessary. However, PG&E did not use LiDAR or spectral imagery for the incident areas in the last five years[9]. Also, PG&E allows the use of aerial patrols in place of ground patrols.

For the incident areas, PG&E used two VM contractors as part of its vegetation management. Western Environmental Consultants, Inc. (WECI) conducted the vegetation PI to inspect and identify tree work and The Davey Tree Expert Company (Davey Tree) performed the vegetation work that included trimming or removal. Davey Tree is the primary contractor in this area and is allowed to subcontract their type of work to other companies. SED did not identify subcontracted work in this area.

Vegetation PIs are performed by a Consulting Utility Forester (CUF), an individual qualified by PG&E, who inspects all vegetation that have the potential to grow into or fall into the distribution primary conductors before the next inspection and identify vegetation that is currently causing strain/abrasion of secondary conductors.

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[6] Bates PGE-CPUC_00005827_CONFIDENTIAL. Utility Standard TD-7102S, Published on 9/4/15. Rev 1.

[7] PG&E uses the term "Pre-Inspection" to describe routine vegetation management inspections.

[8] LiDAR (an acronym of Light Detection And Ranging) is a surveying technology that measures distance by illuminating a target with a laser light. (Source: Wikipedia.)

[9] Bates PGE-CPUC_DR-112117_Common_Q14.

PG&E's PI contract specification[10] requires a CUF to have at least two years' experience in line clearance tree pruning work, or equivalent experience as determined by PG&E. The PI contract specification also notes that PG&E desires that a CUF have an associate's degree in forestry, arboriculture or a related field, however, an associate's degree is not a requirement. The CUF should be "familiar with the Contractor's work practices, proper arboricultural techniques and practices, proper integrated pest management practices, PG&E's Tree Pruning Specification, PG&E's Pre-Inspection Specification and requirements, and all applicable legal and regulatory requirements."[11]

SED reviewed PG&E's VM documentation for the previous five years before this incident and searched for Alder trees similar to the subject tree for Nuns 1. SED focused on reviewing documented inspections and resulting vegetation work orders from those inspections. PG&E performed VM activities on the Dunbar-1101 circuit in 2012, 2014, 2015, 2016, and July 1, 2017. However, WECI personnel did not identify any trees or any vegetation for work at 1210 Nuns Canyon Road[12] in any routine VM inspections.

Of the routine VM documentation reviewed for Nuns 2, SED did not find relevant vegetation work orders.

ii. Enhanced Vegetation Inspections

In addition to routine VM, PG&E contracted WECI to perform an additional inspection on November 1, 2016, related to a Catastrophic Event Memorandum Account (CEMA), at the incident location.

CEMA is an account used to recover the costs associated with the restoration of service and facilities affected by catastrophic events that have been declared disasters or states of emergency by federal or state authorities. PG&E will file an application to recover the CEMA balance through rates. The amount to be recovered are the reasonable costs incurred, which are determined after CPUC review and audit of the recorded CEMA balance.

Of the enhanced VM documentation reviewed for the subject site, SED did not identify work orders related to the subject tree.

iii. PG&E VM Quality Control (VMQC) and VM Quality Assurance (VMQA)

[10] Bates PGE-CPUC_DR-071918_General_Q04. PG&E Pre-Inspection contract specification. Section 3.2.

[11] Bates PGE-CPUC_DR-071918_General_Q04. PG&E Pre-Inspection contract specification. Section 3.2.

[12] Bates PGE-CPUC_00010070_CONFIDENTIAL.

PG&E's VMQA program audits PG&E facilities for any compliance violations, e.g., GO 95 or Public Resource Code (PRC) Section 4293, while PG&E's VMQC program audits PI and TC personnel for any vegetation work that is missed or not performed correctly. VMQA audits are required to be performed by PG&E's VMQA standard[13], annually at a minimum. PG&E does not require routine VMQC audits and PG&E describes the locations chosen for VMQC audits as "computer-generated" and "randomized".

In the last five years, VMQC audits were performed by PG&E contractor California Forestry & Vegetation Management. PG&E performed one VMQC audit for the Nuns 2 incident location and none for the Nuns 1 location. SED did not identify any PG&E QC findings for Alder trees on the subject circuit.

SED also reviewed PG&E's VMQA audit reports from 2012 through 2017 and focused on the Dunbar-1101 circuit. The VMQA audits verified compliance in PG&E's North Coast Division, which includes both incident locations. During the five-year time period, California Forestry & Vegetation Management and Western Environment Consultants Incorporated performed the audits as directed by PG&E. VMQA audits sort vegetation non-compliances into five categories:

1. Contact with conductor.
2. Within four feet of conductor.
3. Trees that have the potential of being non-compliant within 90 days of auditor observation.
4. Trees that may not hold compliance with GO 95, Rule 35 or PRC §4293 before the next fire season.
5. Trees that present a potential threat to the conductors, called Facility Protect Trees (FPT).

In PG&E's 2014 Audit #7N DS2-14S[14], auditors identified three Valley Oak trees that were within four feet of the conductor but greater than 18 inches away. The report also noted that 38% of the non-compliant trees identified were linked to one inspector, including the three Valley Oak trees. The subject tree was not identified in the VMQA audits SED reviewed.

iv. Applicable PG&E Vegetation Management Standards and Procedures

PG&E's Distribution Routine Patrol Procedure[15] describes various factors when patrolling or pre-inspecting trees for vegetation work. Under section 2.6 "Hazard

[13] Bates PGE-CPUC_00006027_CONFIDENTIAL.

[14] Bates PGE-CPUC_00006960_CONFIDENTIAL.

[15] PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15.

Trees/Facility Protection Trees"[16] the document describes trees that should be identified as such. "(T)rees or portions of trees that are dead, show signs of disease, decay or ground or root disturbance, AND may fall into or otherwise impact primary or secondary conductors, THEN PRESCRIBE work to make tree Facility Safe per Facility Protect and work Difficulty Classification Procedure."[17]

PG&E's Vegetation Management Hazard Tree Rating and Scoring Procedure[18] aids inspectors in prescribing work for potentially hazardous trees.

v. Vegetation Analysis by CAL FIRE

CAL FIRE contracted a Certified Arborist, Mark Porter, to evaluate the subject Alder tree failure. In Mr. Porter's "Evaluation of Alder Tree Failure" report[19], Mr. Porter found that the subject Alder tree branch failed due to "excess load exceeding material strength of wood". Also, diagnostic test results reported fungal decay that may have weakened the branch's strength. Abrasion marks were also noted on broken branches found on the ground next to the Alder tree. Mr. Porter did not note any obvious visual signs of decay on the Alder tree. Figure 2 below shows the tree failure documented by Mr. Porter.

[16] PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15. Page 8.

[17] PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15. Page 8.

[18] PG&E Vegetation Management Hazard Tree Rating and Scoring Procedure. Utility Procedure: TD-7102P-07. Publication Date: 10/13/2014. Appendix A, Page 11.

[19] Evaluation of Alder Tree Failure. Author: Mark Porter, ISA Certified Arborist # WE465. Dated October 17, 2017.

Figure 2. Alder tree branch failure at Location #1. **Left:** Alder tree failure points. **Right:** Failed Alder tree branches on the ground. (Source: Evaluation of Alder Tree Failure by Mark Porter)

In addition, SED reviewed a field report[20] authored by Jeremiah Steuterman, a CAL FIRE Forestry Assistant, that describes the trees at Nuns 1 and Nuns 2. In regards to the Nuns 1, including the Alder tree, Mr. Steuterman did not find evidence of rot, insects, pathogens, or loss of structural integrity on what he identified as a "Red Alder (Alnus Rubra)".

At Nuns 2, Mr. Steuterman found that the subject "California Bay Laurel" (Umbellularia californica), which a CAL FIRE investigator had identified as an "Oak tree,", exhibited evidence of rot in the bole of the tree which led to "extensive decay and loss of structural integrity". It is unclear to SED whether the rot could have been reasonably discovered prior to the tree failure and the order of events leading to the tree's failure. However, the CAL FIRE investigator ruled out the tree at Nuns 2 as a source of ignition.

Based on the VM records reviewed above and evidence provided by Mr. Porter and Mr. Steuterman, SED did not identify a vegetation management related violation by PG&E.

[20] CAL FIRE Field Report. Author: Jeremiah Steuterman, CAL FIRE Forestry Assistant II. Dated October 11, 2017.

C. PG&E's Infrastructure Conditions

SED verified compliance with GO 95 construction standards and GO 95, Rule 31.1 during their review of PG&E's physical infrastructure.

On October 16, 2017, SED staff, Raymond Cho, Ryan Yamamoto and Wilson Tsai, examined the Nuns 1 site and met with the lead CAL FIRE investigator, Captain Kyle Steis. Several PG&E representatives also investigated the site and aided in evidence collection. At the incident span, SED staff encountered the suspect tree, which was later identified as an Alder tree, located across the creek to the west. A large branch from the subject tree, about six inches in diameter, had broken off and fallen into the secondary voltage (120/240 V) road-side conductor. SED staff found one conductor on the ground while the center and field-side phases were still intact and attached to the poles. However, on Pole #2 toward the south, the center phase's insulator pin had broken and the insulator rested on the cross arm. The road-side conductor separated about 4-6 feet from the insulator pin. While taking a closer look at Pole #2, SED staff discovered a slack anchor guy which is a potential violation of GO 95, Rule 56.2. However, it is unknown whether or not this condition was caused by the tree branch failure or if it was an existing condition prior to the fire.

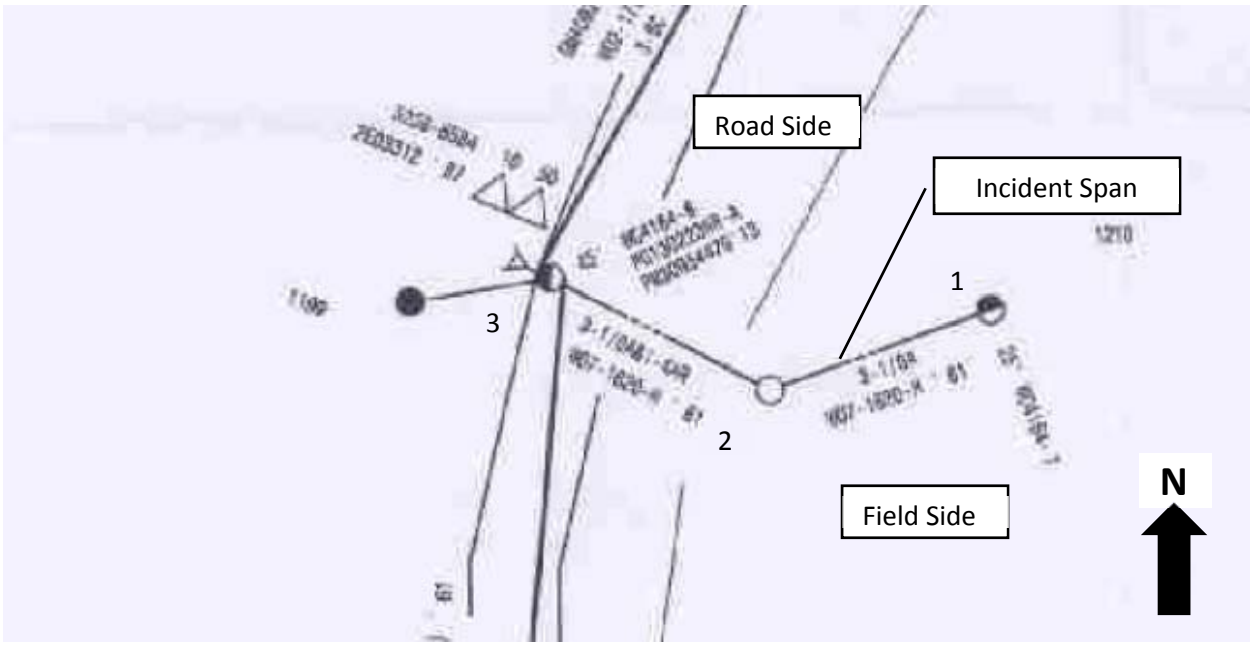

Figure 3. Schematic of pole locations and incident span between Pole #1 and #2. (Source: PG&E with added notes)

On the same day, PG&E field employees arrived about an hour after SED staff arrived to aid in evidence collection at the Nuns 1 scene. The PG&E employees took measurements of the span length, height at the deformation on the center phase, and field-side to center and road-side to center phases at each pole. SED staff documented and reviewed the measurements but did not observe any clearance related issues.

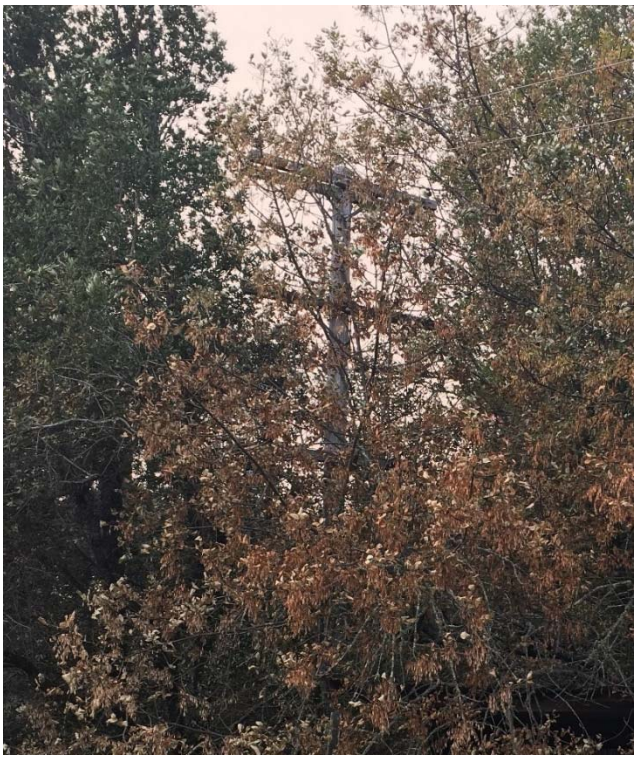


Figure 4. Left. Photo of pole #2 behind trees closest to road taken from the east. **Right.** Photo of pole #1 (approximate GPS coordinates 38.3940925, -122.5159884) immediately downstream, northeast of pole #2 taken from the east.

For Nuns 1, the subject conductors were size 1/0 uninsulated Aluminum and were part of PG&E's Dunbar-1101 circuit normally operating at secondary voltage. The three subject conductors spanned approximately 115 feet between poles and were installed in 1953. Figure 4 above shows the two subject poles that supported the incident span.

In reference to the subject span, PG&E identified the upstream class 4, 35-foot wood pole (PG&E pole #101993035, GPS coordinates 38.396168, -122.515159) was located to the west of the next downstream pole. The downstream pole to the east that PG&E identified was a class 6, 35-foot pole (PG&E pole #102036545, GPS coordinates 38.396261, -122.514809). SED noted approximate GPS coordinates for pole #1: 38.3940925, -122.5159884. Therefore, SED does not believe that PG&E provided the correct pole intrusive inspection information[21]. Regardless, the poles carrying the subject span did not fail and therefore did not contribute to the fire.

Based on the infrastructure SED reviewed, SED did not identify a violation at the physical incident location.

[21] Bates PGE-CPUC_00006285_CONFIDENTIAL and PGE-CPUC_00006287_CONFIDENTIAL.

D. PG&E's Equipment Operations and Maintenance

SED verified compliance with GO 95, Rule 31.1 during their review of PG&E distribution equipment operations and maintenance records.

On October 8, 2017, the Dunbar-1101 Circuit Breaker (CB-1101) had data recording capability prior to and for a limited duration during the fire. SED staff reviewed the Supervisory Control and Data Acquisition (SCADA) load data recorded at the equipment listed below for October 8, 2017.

Figure 5. Diagram showing a transformer (denoted by XFMR) and protective devices upstream of incident span/Area of Interest. Not drawn to scale. (Source: PG&E[22])

Prior to and during the incident, the subject span was protected by upstream Line Recloser (LR) 47964 and the Dunbar (CB-1101). CB-1101 is the source device for the Dunbar circuit and subject span. All smart meter data referenced below are sourced from smart meters located downstream of LR-47964 except one (service point #1009167332) that is not served by the Dunbar-1101 circuit.

[22] Bates 2018.05.22_CPUC Nuns Factual Report.

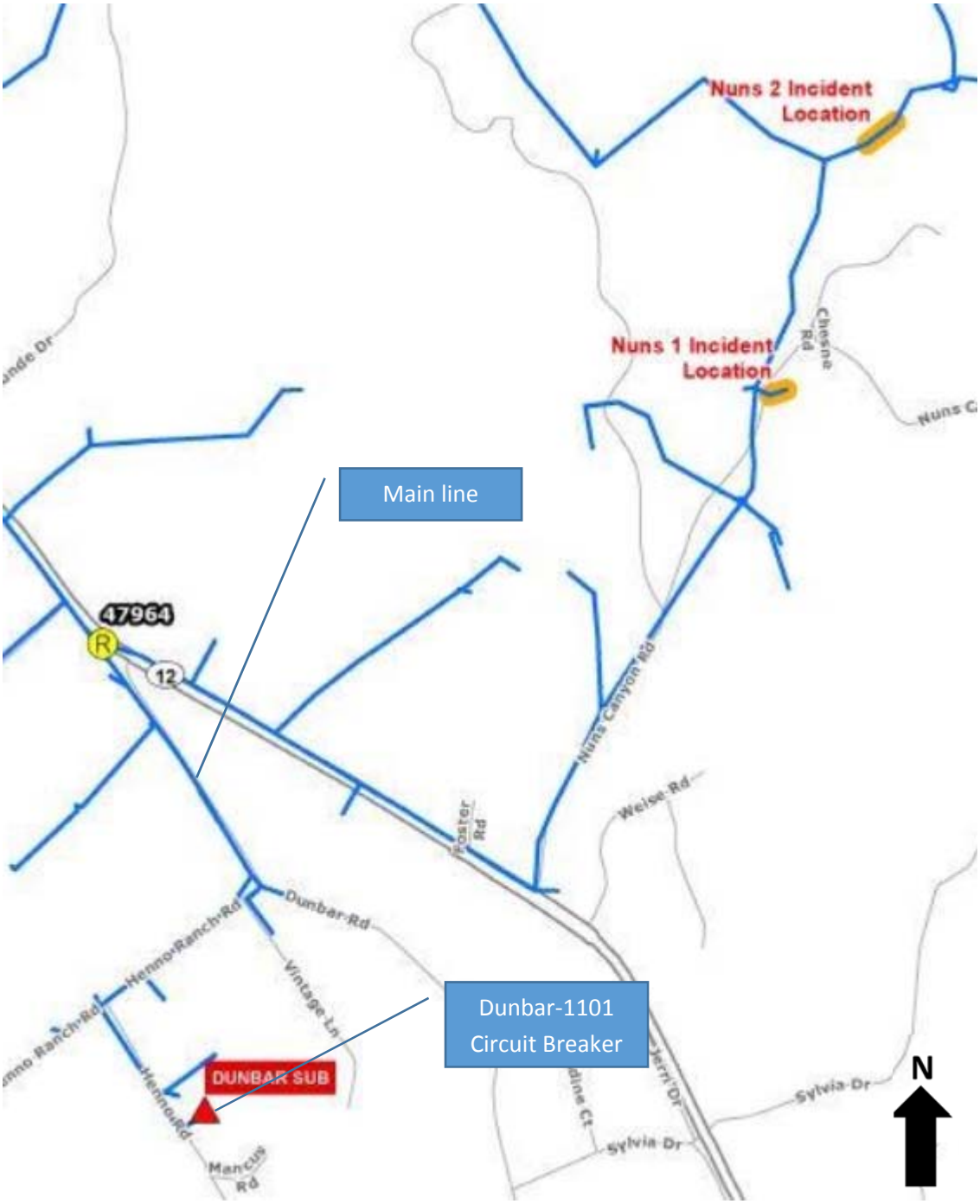

Figure 6. Map showing the approximate locations of protection devices upstream of incident span/Area of Interest. Not drawn to scale. (Source: PG&E)[23]

[23] PGE-CPUC_00023056_CONFIDENTIAL Nuns.

i. Event Timeline

October 8, 2017

2218 hours – Two smart meters register a Last Gasp event downstream of incident span. Last Gasp is an indication of total power loss of the smart meter.[24]

2234 hours – Approximate ignition time of Nuns fire.
First responders receive first 911 call regarding the Nuns fire from an individual located at 11775 Sonoma Highway.[25]

2251 hours – LR-47964 operates open and then closes in approximately 10 seconds and twelve downstream smart meters register power failures because of the open operation.[26]

2300 hours – LR-47964 records an overcurrent trip. Fault data shows load on phases A, B and C as 5 Amps, 564 Amps and 565 Amps respectively.[27]

2358 hours – Eleven downstream smart meters register power failures.[28] Also, at this time, CB-1101 registers alarms for the load on phase A exceeding "High" and "High High" load limits set by PG&E. The "High" limit was set for 570 amps and the "High High" limit was set for 590 amps.[29] As a result of a fault related to these load limit alerts, the CB operated open and reclosed within a minute once the fault was cleared downstream.[30]

2359 hours – LR-234's reclose relay is automatically cut out thus disabling the reclose capability once it operates open.[31]

October 9, 2017

0000 hours – PG&E remotely disables reclosing capability for CB-1101.[32]

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[24] Bates PGE-CF_00000027_Confidential.

[25] Bates Nuns Supplement 12-31.

[26] Bates PGE-CPUC_00007893 and PGE-CPUC_00007896.

[27] Bates PGE-CF_00004972.

[28] Bates PGE-CF_00000027_Confidential.

[29] Bates PGE-CPUC_00007876.

[30] Id.

[31] Bates PGE-CPUC_00007876.

[32] Id.

0001 hours - PG&E remotely opened CB-1101 which de-energized the entire Dunbar-1101 circuit. At the same time, two downstream smart meters registered power failures.[33]

End of Timeline

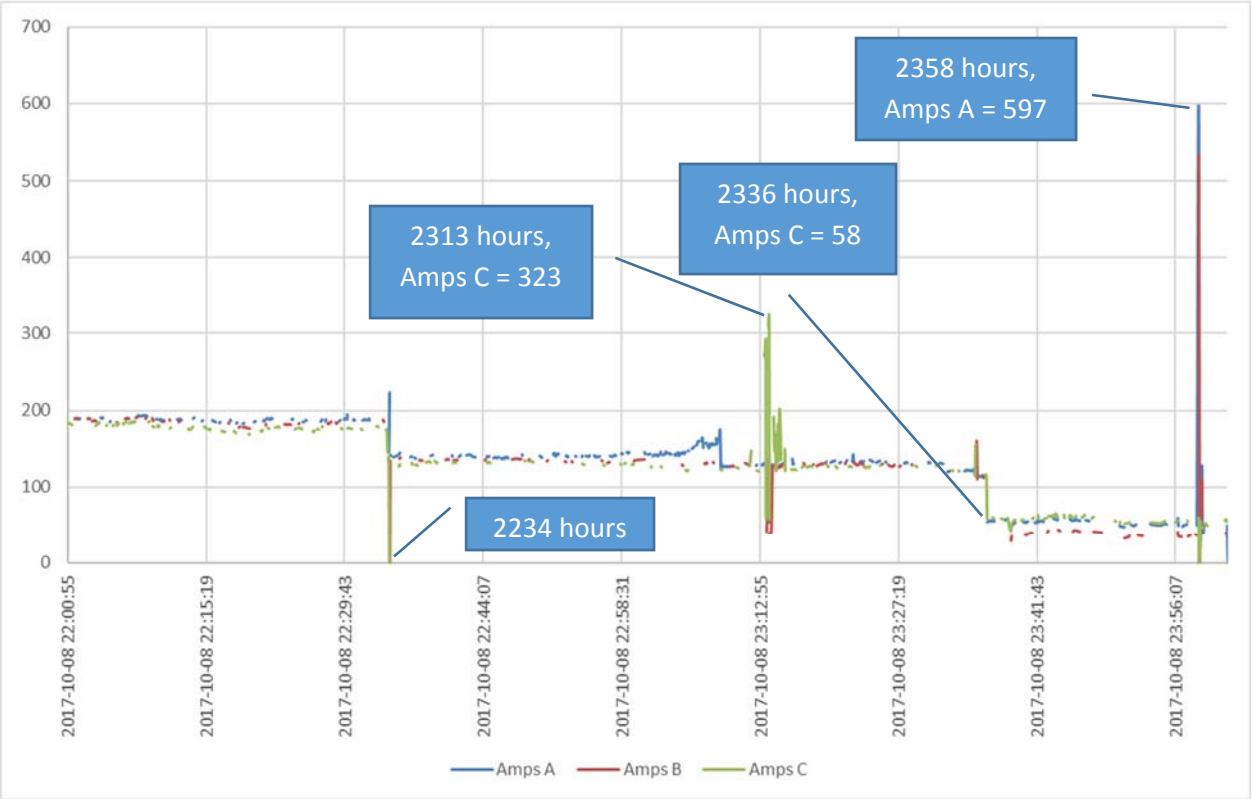


Figure 7. SCADA plot of load data recorded at Dunbar-1101 CB from October 8, 2017 at 2200 hours to October 9, 2017 at 0001 hours. The chart highlights times that signify either an operation of equipment (open/close) or a fault on the circuit.

On October 8, 2017 at 2251 hours, LR-47964 opened and reclosed once. The LR is set to operate 4 times before locking out[34] and did not seem to malfunction. PG&E last changed the settings for LR-47964 on February 23, 2016. Of the three phases, phases B and C recorded an overcurrent event ranging from 562 to 565 amps at around 2313 hours (adjusted time based on SCADA load data recorded at the Dunbar-1101 CB; originally 2311 hours). For comparison, the third phase (Phase A) registered about 4-5 amps.

On October 18, 2017 at 1400 hours, a troubleman found two fuses open for fuse #15877[35] that protected Nuns 2. This fuse is located downstream of Nuns 1, however, SED could not determine when the fuses opened. As mentioned above, the source

[33] Id and Bates PGE-CPUC_00013124.

[34] Bates PGE-CPUC_00021172 and PGE-CPUC_02082019-DR_Nuns_Q01.

[35] Bates PGE-CPUC_DR-071918_Nuns_Q12.

device for Dunbar-1101 was opened around midnight on October 9, 2017, so no power was supplied to fuse #15877 after that time.

SED also reviewed equipment test records for LR-47964 and the Dunbar-1101 CB. PG&E provided one record for LR-47964, which is located upstream of both locations. PG&E inspectors completed the inspection on December 2, 2017 and did not provide any additional records since the device was installed sometime in 2016[36]. SED did not observe issues with the CB or LR after reviewing the equipment test records.

Based on the SCADA and smart meter records reviewed, SED did not identify a violation by PG&E regarding its equipment operations and maintenance.

E. Other Field Observations and Review of Physical Evidence

On November 21, 2017, SED staff field investigated the Nuns 2 site that PG&E's contracted investigator identified. During SED's visit, PG&E retained two AT&T cable bundles left on the side of the road. PG&E employees also retrieved two solid copper conductor spans between the subject poles on this site. However, CAL FIRE investigators ruled out this site as an ignition point for the Nuns fire[37].

On June 11, 2018, SED staff visited PG&E's evidence storage location in Oakland, California. SED identified abrasion and separation for the solid copper conductors PG&E retained from Nuns 2. The conductors were labeled as part of the Nuns fire at 1210 Nuns Canyon Road.

[36] E-mail between Raymond Cho and Meredith Allen. Subject: Re_ Data Request 6_ Common Question 3. Date: 3/26/19.

[37] 17CALNU010049 CAL FIRE Nuns Investigation Report.

Figure 8. PG&E evidence items from Nuns 2 location. **Left:** Abrasion on solid copper conductor. **Right:** End of separated copper conductor.

PG&E did not identify arcing on the conductors collected for Nuns 2[38]. CAL FIRE did not identify this site as an ignition point and SED did not investigate Nuns 2 any further.

On October 12, 2018, SED staff met with CAL FIRE investigators in Santa Rosa and reviewed evidence retained by CAL FIRE for the Nuns 1 location involving the Alder tree branch. Of the evidence reviewed, SED found metal transfer on a tree limb, abrasion on a tree limb and pitting on all conductor phases. SED could not determine the cause of pitting on the conductors since there were no obvious signs of charring or arcing associated with the pitting.

Figure 9. Abrasion circled in red on Alder tree limb. CAL FIRE evidence item number E-1.

[38] Bates PGE-CPUC_02082019-DR_Nuns_Q03.

Figure 10. Metallic transfer on Alder tree limb. CAL FIRE evidence item number E-3.

Figure 11. One end of the downed roadside conductor near the Alder tree.

IV. CAL FIRE Investigation

CAL FIRE investigator, Captain Kyle Steis, determined that the "the Nuns Fire ignited as a result of a section of an Alder tree detaching from the stem and contacting an energized powerline conductor causing the conductor to fall to the ground contacting a

receptive fuel bed and ignited the Nuns fire."[39] Captain Steis determined that the subject Alder branch failed and fell into secondary voltage conductors.

Mr. Porter, the CAL FIRE contracted ISA Certified Arborist, did not note any visual signs of decay on the Alder tree that contributed to the branch failure. Also, Mr. Steuterman reported "no infections were observed at these sites"[40] for Nuns 1. CAL FIRE did not identify any violations by PG&E for the Nuns fire.[41]

Mr. Porter and Mr. Steuterman, who are trained and qualified professionals in a vegetation management related field, did not identify signs of hazardous tree conditions that PG&E inspectors would have reasonably been able to identify and mitigate prior to the fire.

V. Conclusion

Based the evidence reviewed, SED found a violation by PG&E of GO 95, Rule 35 relating to PG&E's discovery during a September 22, 2017 detailed inspection of a tree that was in contact with and straining a secondary conductor and for which PG&E improperly prioritized the needed vegetation work to correct this immediate safety hazard. PG&E inspectors found the unsafe condition on September 22, 2017[42] and produced work order #113271607. Although this violation did not directly contribute to the ignition of the Nuns fire, it represents an unsafe practice conducted by PG&E.

If SED becomes aware of additional information that could modify SED's findings in this Incident Investigation Report, SED may re-open the investigation and may modify this report or take further actions as appropriate.

VI. Attachments

Attachment A – CAL FIRE Investigation Report – Case No. 17CALNU010049

Attachment B – CAL FIRE Arborist Report by Mark Porter

Attachment C – CAL FIRE Forester Report by Jeremiah Steuterman

Attachment D – CAL FIRE Evidence List

Attachment E – PG&E Work Order #113271607

[39] CAL FIRE Fire Investigation Report 17CALNU010049. Page 3.

[40] CAL FIRE Field Report. Author: Jeremiah Steuterman, CAL FIRE Forestry Assistant II. Dated October 11, 2017. Page 2.

[41] Id. Page 2.

[42] Bates PGE-CPUC_00008687_CONFIDENTIAL.

ATTACHMENT A

CAL FIRE Investigation Report

Case Number 17CALNU010049

CAL FIRE

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION

Sonoma-Lake-Napa Unit
1199 Big Tree Lane
Saint Helena, CA 94574

INVESTIGATION REPORT

CASE NUMBER:	17 CALNU 010049
CASE NAME:	Nuns
DATE:	October 08, 2017
INCIDENT TYPE:	Wildland
INCIDENT INVESTIGATOR(s):	Lead investigator: [redacted]

1 - VIOLATION(S):

None

2 - SUMMARY:

On October 08, 2017 at 11:11 p.m., the CAL FIRE Saint Helena Emergency Command Center (ECC) dispatched a wildland fire at 2 Nuns Canyon Road in the community of Glen Ellen, located in Sonoma County, California. The ECC named the fire Nuns. Firefighting resources from CAL FIRE and various other Fire Departments responded to the fire.

The Nuns fire originated in a field at the address of 1210 Nuns Canyon Road in the community of Glen Ellen on the night of October 08, 2017. Within the field a section of tree detached from the stem and contacted a powerline conductor. The powerline conductor fell to the ground, contacted a receptive fuel bed, and ignited the Nuns Fire.

Around the time of dispatch for the Nuns Fire, a remote automated weather station located 1.6 miles away recorded an average wind speed of 17 miles per hour and gusts at 45 miles per hour. The wind contributed to the advancement of the Nuns Fire. A red flag warning was issued by the National Weather Service for the Sonoma-Lake-Napa Unit starting at 11:00 AM on October 08, 2017.

The Nuns Fire burned into adjoining fires and became part of the Central LNU Complex. The Nuns, Adobe, Norrbom, Pressley, Partrick and Oakmont/Pythian fires are all incorporated into the Central LNU Complex. The Central LNU Complex was contained on October 31, 2017. The Central LNU Complex consumed 56,556 acres and damaged and destroyed 1,527 structures (See Damage Inspection Summary Report).

Based on my origin and cause investigation, I determined the Nuns Fire ignited as a result of a section of an alder tree detaching from the stem and contacting an energized powerline conductor causing the conductor to fall to the ground contacting a receptive fuel bed and ignited the Nuns Fire.

3 - SUBJECT:

A powerline conductor located on the property of 1210 Nuns Canyon Road, Glen Ellen, CA.

Global positioning system coordinates: N 38 23.648, W 122 30.977

4 - VICTIM(S)

In total the Nuns incident burned 56,556 acres within Napa and Sonoma Counties. The fire damaged and/or destroyed 1527 structures in Napa and Sonoma County (See Damage Inspection Summary Report) and resulted in 2 fatalities.

WITNESSES:

W-1 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Seeing fire coming from Nuns Canyon and Nelligan Road toward her property the night of October 08, 2017

W-2 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Performing structure protection at 1210 Nuns Canyon Road on the night of October 08, 2017

W-3 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Being at 1210 Nuns Canyon Road the night of October 08, 2017

W-4 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Arborist at Nuns Fire, evaluated tree and provided report

W-5 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Forestry Assistant II at Nuns Fire, evaluated trees and provided report

W-6 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Providing scene security at the origin of Nuns Fire

W-7 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Providing scene security at the origin of Nuns Fire

W-8 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Providing scene security at the origin of Nuns Fire

W-9 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Providing scene security at the origin of Nuns Fire

W-10 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Providing scene security at the origin of Nuns Fire

W-11 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Providing scene security at the origin of Nuns Fire

W-12 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Provided investigation assistance

W-13 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Provided investigation assistance

W-14 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Provided investigation assistance

W-15 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Provided contact telephone number for [redacted]

W-16 Name: [redacted]
Address: [redacted]
Phone [redacted]
Can testify to: Assisted with evidence transportation

W-17 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Assisting with investigation of Nuns Fire

W-18 Name: [redacted]
Address [redacted]
Phone: [redacted]
Can testify to: Assisting with investigation of Nuns Fire

W-19 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Origin and cause investigation

W-20 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: PG&E representative during evidence collection

W-21 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Fire Investigator hired by Pacific Gas and Electric

W-22 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Reviewing collected evidence

OTHERS:

O-1 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Clearing Nuns Canyon Road of downed trees

O-2 Name: [redacted]
Address: [redacted]
Phone: [redacted]
Can testify to: Providing aerial bucket truck for Nuns Fire

5 - EVIDENCE:

E-1 Section of tree limb

E-2 Section of tree limb

E-3 Section of tree limb

Evidence items E-1-E-3 were sections of the detached tree that came in contact with the powerline conductor. In the narrative referred to as detached section of tree/tree top.

E-4 Short section of wire

Evidence item E-4 was section of powerline conductor connected to the wooden cross member of the power pole located in the field at 1210 Nuns Canyon Road.

E-5 Wood pin

Detached from wooden cross member on power pole located in field at 1210 Nuns Canyon Road.

E-6 Center phase wire

Collected as part of the powerline conductor span located at 1210 Nuns Canyon Road

E-7 East span powerline conductor

Collected as part of the powerline conductor span located at 1210 Nuns Canyon Road

E-8 West span powerline conductor

Collected as the powerline conductor span that was in contact with the ground at 1210 Nuns Canyon Road.

E-9 West span wood pin and conductor

Collected as part of the power line equipment

6 – CONDITION(S):

Fuel:

Grass oak woodlands in lower elevations and valley, brush mid slope, timber/hardwood mix at higher elevations.

Weather:

The National Weather Service put out a red flag warning for the North-East Bay and Santa Cruz Mountains starting at 11:00 AM Sunday October 08, 2017 through October 15, 2017 (See attachment 4).

Weather station ID: KENWW
Weather station distance from Nuns SOA: 1.6 miles, Northwest
Time: 11:00 PM
Temperature: 72 degrees Fahrenheit
Relative humidity: 12%
Wind speed: 17.1 mph
Wind gust: 45.7 mph
Wind direction: North

Weather station ID: E2362
Weather station distance from Nuns SOA: 9 miles, Northwest
Time: 11:39 PM
Temperature: 73 degrees Fahrenheit
Relative humidity: 13%
Wind speed: 12 mph
Wind gust: 36 mph
Wind direction: North

Weather station ID: Hawkeye RAWS
Weather station distance from Nuns SOA: 30 miles, North
Time: 11:56 PM
Temperature: 64 degrees Fahrenheit
Relative humidity: 12
Wind speed: 48 mph
Wind gust: 79.01
Wind direction: North/Northeast

Topography:

The Nuns Fire burned in various terrain from the valley floor to the mountains.

7 – EQUIPMENT:

A powerline conductor located at 1210 Nuns Canyon Road, Glen Ellen, CA

8 - PROPERTY:

The origin of the Nuns Fire was located in a flat field on the following property:

APN: 052-040-008

Address: 1210 Nuns Canyon Road, Glen Ellen, CA

Owner: [redacted]

In total, the Central LNU Complex burned 56,556 acres within Napa and Sonoma Counties. The fire damaged and/or destroyed 1527 structures in Napa and Sonoma County (See Damage Inspection Summary Report) and resulted in 2 fatalities.

9 - NARRATIVE:

(All times and measurements are approximate)

On October 08, 2017 at 11:11 p.m., the CAL FIRE Saint Helena Emergency Command Center (ECC) dispatched a wildland fire at 2 Nuns Canyon Road in the community of Glen Ellen. The ECC named the fire Nuns. Firefighting resources from California Department of Forestry and Fire Protection (CAL FIRE) and various other Fire Departments responded to the fire.

On October 09, 2017, I was employed by the California Department of Forestry and Fire Protection (CAL FIRE) as a peace officer. On October 09, 2017, I responded to the Nuns Fire to conduct an origin and cause investigation of the fire. I drove to the fire's dispatched location on Nuns Canyon Road. Nuns Canyon Road is a rural county road that runs north to south with wooden power poles and powerline conductors running parallel to the road located on the west side. For my safety and to avoid any potential contact with downed powerline conductors, I visually examined the powerline conductors confirming all were intact as I drove down the road. I parked near the driveway to 1210 Nuns Canyon Road. The address of 1210 Nuns Canyon Road was located one half mile off Sonoma Highway toward the north east. The road past 1210 was blocked with downed tree limbs and debris.

Powerline conductor is used in this report based on the following definitions.
Collins English Dictionary defines power line as a cable, especially above ground, along which electricity is passed to an area or building. State of California rules for Overhaed Electric Line Construction General Order No. 95 defines conductor as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics. The Guide to Wildland Fire Origin and Cause Determination published by the National Wildfire Coordinating Group defines the category of powerlines to include all electrical equipment associated with the production, transmission, and use of electricity.

I walked north on Nuns Canyon Road. I observed thick smoke and active fire burning. I observed two powerline conductors laying on the road between pole #6459, PG&E 019636 and pole # 15630. I continued to walk cautiously past the downed span to the fire's edge. For my safety and to avoid any potential contact with downed powerline conductors, I continued to look up at the powerline conductors to confirm all were intact. I walked to the fire's edge (N 38 23.892, 122 30.805) and observed a backing fire on both sides of Nuns Canyon Road. I did not observe any additional powerline conductors down.

I returned to the section of downed powerline conductors between pole #6459, PG&E 019636 and pole # 15630. I observed what appeared to be an oak limb suspended on a utility line over the span of downed powerline conductors (IMG_1519). I visually examined the limb and the base of the tree where the limb detached. The exposed wood located at the top of the base of the tree appeared to be fresh wood and displayed minimal signs of fire damage. The bark around the tree base had signs of fire damage (IMG_1550).

I returned to 1210 Nuns Canyon Road. I walked the span of powerline conductors located to the south of 1210 Nuns Canyon. I visually examined pole #120120432. The wooden power pole appeared to have three wooden cross arms with two transformers and powerline conductors that went to the east and west. I walked out the powerline conductors to the west. The powerline conductors appeared to run to a weather head located in a large gravel turn out. The weather head and all powerline equipment appeared to be in good working order. I visually followed the powerline conductors to the east from pole# 120120432 to a wooden power pole located in a field at 1210 Nuns Canyon Road, east of Calabazas Creek.

I walked on to the property at 1210 Nuns Canyon attempting to locate the wooden power pole located on the east side of Calabazas Creek. The wooden power pole was located next to what appeared to be a pump house. The pump house contained what appeared to be a pressure tank and water storage container. There were no identifying marks on the wooden power pole. The wooden power pole was surrounded by vegetation in close proximity to powerline conductors. (IMG_1415). Three powerline conductors run north to

south from the pump house power pole, connecting to another power pole in the field and eventually attaching to a residence. I identified the three powerline conductors as the west span, center span, and east span based on their cardinal point location on the power pole. The west span was closest to Calabazas Creek, on the west side of the power pole. The east span was on the field side of the power pole. The center span was located between the east and west span.

I observed the west span powerline conductor that was connected to the pump house power pole resting on the ground. I observed a section of tree had detached from the stem and was resting on top of the west span powerline conductor. It appeared when the section of tree detached from the stem, it fell towards the east and came in contact with the west span powerline conductor, causing the powerline conductor to separate and fall to the ground. A short section of the west span powerline conductor remained attached to the cross arm of the power pool next to the pump house. The center and east powerline conductors remained suspended. The center span powerline conductor appeared to have a bow in it (IMG_1629).

At 4:30 p.m., CAL FIRE Investigator [redacted] arrived to assist with the origin and cause investigation. I briefed [redacted] on the fire and investigation. We flagged off an area with yellow and black flagging to the north and south of 1210 Nuns Canyon Road, designating an area not to be entered.

At 5:25 p.m., I contacted the ECC to request a security guard to maintain overnight scene security at the Nuns Fire.

Scene security was provided and maintained through the duration of Nuns Fire investigation. Each security officer parked their vehicle on Nuns Canyon Road, south of the address of 1210, outside of the flagged off area. Clear and concise direction were given that nobody is to enter the flagged off area and to complete an ICS 214, logging any activity throughout the day and night. Each morning I arrived at 1210 Nuns Canyon Road, I collected a filled-out ICS 214 from the previous night security guard (See

attachment 11).

At 9:35p.m. I left the Nuns Fire.

On October 10, 2017, at 7:35 a.m., I returned to the Nuns Fire. [redacted] arrived a short time later.

At 8:15 a.m. [redacted] conducted a follow up interview at the [redacted] with [redacted] In summary [redacted] stated on October 08, 2017 around 10:35 p.m. she smelled smoke and called 911 to report she smelled smoke. While on the phone with 911 she saw fire coming from Nuns Canyon Road and Nelligan Road toward [redacted] A LE 78a witness statement was left with [redacted] to fill out at a later time.

[redacted] and I walked out Nuns Canyon Road to the north of 1210 Nuns Canyon Road. We observed macro fire direction indicators of foliage freeze and protection. For our safety and to avoid any potential contact with downed powerline conductors we looked at all the powerline conductor spans as we walked out Nuns Canyon Road. All powerline conductors, power poles, hardware, and power pole fuses were intact. The only span that was not suspended was the span identified the previous day between pole #6459, PG&E 019636 and pole # 15630. We walked back to 1210 Nuns Canyon and observed a power pole on the west side of Nuns Canyon Road that had powerline conductors that ran to west of the power pole.

At 10:58 a.m., [redacted] and I attempted to locate the powerline conductors that ran to the west. We drove onto the [redacted] attempting to follow the powerline conductor span. From our vantage point we could see all powerline conductors were intact. We hiked the remaining section of powerline conductors that could not be seen and confirmed all powerline conductors were suspended and intact. We returned to 1210 Nuns Canyon Road.

At 11:31 a.m., [redacted] received a LE 78a witness statement from [redacted] (See attachment 10).

[redacted] and I examined the wooden power pole located next to the pump house at 1210 Nuns Canyon Road. We focused on trying to locate the detachment point of the west span powerline conductor. With binoculars, we looked at the short section of powerline conductor that was attached to the wooden cross arm of the power pole. The tips of the attached section of powerline conductor appeared to be discolored (IMG_1416-IMG_1418) where the powerline conductor detached.

At 1:15 p.m., I met with [redacted] identified himself as an owner of 1210 Nuns Canyon Road. [redacted] said a tenant named [redacted] was renting the house at 1210 Nuns Canyon Road. [redacted] did not have contact information for [redacted] I gave [redacted] my contact information and asked him to contact me with [redacted] information. I obtained [redacted] contact information.

At 1:48 p.m., [redacted] and I returned to the downed section of tree and powerline conductor near the pump house. We visually examined the section of tree looking for rub/score marks indicating any contact with the powerline conductors.

At 2:30 p.m., Glen Ellen Fire Department fire engine 3385 arrived at 1210 Nuns Canyon Road. [redacted] introduced himself to me. In summary [redacted] told me the following. The night the Nuns fire started he responded to 1210 Nuns Canyon Road and performed structure protection on the residence. He saw fire on both sides of the road. The wind was erratic and blowing in all directions. The shop located on the property was starting to catch fire and the fire was starting to skunk around the back side of the residence. He tried to fill the engine with water from a garden hose on the property and was not able to get any water out of the hose.

CAL FIRE Investigator [redacted] arrived to assist with the origin and cause investigation. [redacted] was briefed on the investigation.

[redacted] and I walked out Nuns Canyon Road. We examined the oak limb suspended on a utility line north of 1210 Nuns Canyon Road I had identified on October 09, 2017. The wood at the base of the tree where the oak limb had detached and the wood at the base of the limb showed minimal fire damage (IMG_ 1542-IMG_1560). Looking at the wood at the top of the base of the tree, from outside to inside, I observed wood colors of tan, red/pink, light brown, and black/dark brown in the center. The bark around the tree base had signs of fire damage. Minimal fire damage to the exposed top wood indicated the tree fell after the fire had passed through. As a group, we concluded the oak limb detached from the base of the tree after the fire passed through that location. The oak limb contacted the suspended powerline conductors, causing the powerline conductors to detach from the power pole and rest on the road.

As a group, we continued our walk out Nuns Canyon Road looking at macro fire pattern indicators. Advancing fire pattern indicators of foliage freeze and protection were observed. For our safety and to avoid any potential contact with downed powerline conductors, we continued to look up at the powerline conductors to confirm all were intact. We continued to look at fire pattern indicators as we walked. A transition of fire pattern indicators was observed further north on Nuns Canyon Road. The fire went from advancing to backing on the north/east side of the road indicating a transition zone. The ground fuels showed less consumption and a lower fire intensity. On the west side of the road the fire pattern indicators made a downhill run. We returned to 1210 Nuns Canyon Road (See attachment 3).

[redacted] and I returned to the wooden power pole next to the pump house. The power pole was re-examined using binoculars. The short section of attached powerline conductor appeared to be discolored at the tips. Further up the wire near the wooden cross arm the powerline conductor appeared to have separation between the wire strands (IMG_1584).

Fire pattern indicator flags were placed in the field near the pump house (IMG_1510-IMG_1518). Red flags were placed to mark advancing fire pattern indicators, yellow flags

were placed to mark lateral fire pattern indicators and blue flags were placed to mark backing fire pattern indicators. Digital photographs of the flags were taken on October 11, 2017. Fire pattern indicators of protection and staining were observed. A general origin area (GOA) was determined based on fire direction indicators. Within the GOA laid the downed powerline conductor and downed section of tree.

At 8:24p.m. I left the Nuns Fire.

On October 11, 2017 at 7:57 a.m., I arrived at 1210 Nuns Canyon Road.

At 8:00 a.m. [redacted] arrived.

At 8:10 a.m., additional fire pattern indicator flags were placed at near the pump house, east side of the creek and on the west side of Nuns Canyon road.

At 9:30 a.m., [redacted] and I focused on fire pattern indicators on the west side of Nuns Canyon Road west of 1210 Nuns Canyon Road. Advancing fire pattern indicators of foliage freeze and spalling were observed indicating the fire advanced uphill, west of Nuns Canyon Road (IMG_1392-IMG_1401). The fire was slope driven and made various uphill runs. We followed the fire pattern indicators uphill until we reached the top of the hill. Backing fire pattern indicators were observed at the top of the hill. The fire burned lower intensity and even staining around rocks was observed (IMG_1566). The fire traveled to the north at the top of the hill and transition to down slope. We continued to follow the fire pattern indicators. We followed the down slope run to Nuns Canyon Road (IMG_1567). The location on Nuns Canyon Road where the downhill fire pattern indicators met the road, was the same area previously identified as transition zone (IMG_1568). Based on the fire pattern indicators observed, the fire made advancing and backing runs and eventually advanced towards the south (See attachment 3 & IMG_1561-IMG_1570).

At 10:30 a.m., CAL FIRE Forestry Assistant II [redacted]

[redacted] arrived at 1210 Nuns Canyon Road. He evaluated the detached section of tree and tree stem located near the pump house at 1210 Nuns Canyon. He also evaluated the suspended oak tree limb and tree base located on Nuns Canyon Road. In summary [redacted] concluded the tree stem and tree top (detached section of tree) located near the pump house was an Alder. The tree did not have evidence of rot or loss of structural integrity. No infections, insects or pathogens were observed affecting the tree (see attachment 5).

At 11:39 a.m., [redacted] completed his evaluation.

At 12:13 p.m., I took digital photographs using my state issued digital camera of the fire pattern indicator flag field. I took digital photographs of the wooden power pole and power pole hardware.

My camera is set on the continuous numbering setting for digital image labeling. The first picture image I took at the Nuns Fire was IMG_1326.

At 3:42 p.m., observations and measurements of the tree top and stem located near the pump house at 1210 Nuns Canyon Road was taken.

The tree top had numerous tree branches extending off with green colored leaves. The tip of the tree top was detached (IMG_1640). The tip of the tree appeared to have a rub/score mark on it (IMG_1501-IMG_1503).

The length of the tree top was twenty-nine feet, six inches. The distance from the stem of the tree to the base of the tree top was three feet, eleven inches. The distance from tree stem to the GOA was thirty feet.

The stem of the tree was located near Calabazas Creek. The creek had water in it. The upper section of stem of the tree appeared to have minimal fire damage (IMG_1465-IMG_1467). The base of the tree stem appeared to have fire damage on the northeast side.

I walked a large circle around the downed tree top with powerline conductor beneath it two times, once clockwise and once counter clockwise looking at all aspects of the tree. The tree top had advancing fire pattern indicator flags to the south and east, lateral fire pattern indicator flags to the northeast and backing fire pattern indicator flags to the west. The tree top and powerline conductor was located inside of the GOA. The foliage of the tree top appeared to curl in toward the limb (IMG_1469, 1497-1499) and detached twigs on the ground showed signs of backing. The fire pattern indicators support the fire started underneath the tree top. The tree top displayed fire damage on the underside of the limb, indicating the tree top came down before the fire passing through. Fire damage to the tree top displayed low intensity of fire, not a lot of consumption of fuel and minimal depth of char (IMG_1489-IMG_1496).

Standing near the GOA, I looked up at the center and east powerline conductor span. I observed the center powerline conductor span had an indentation/bow in the line (IMG_1506-1507). The east powerline conductor span did not appear to have the same indentation/bow in the span.

At 4:16 PM, two reference points were located at 1210 Nuns Canyon Road at. A metal stake was placed in the ground at reference point one (RP1) and global positioning systems (GPS) coordinates (WGS 84) were taken (N 38 23.645 W 122 30.967). The concrete casing around what appeared to be the pump well was identified as reference point two (RP2) and GPS coordinates were taken (N 38 23.643 W 122 30.982).

Measurements from RP1 and RP 2 to the center of the GOA were taken.
RP1 to GOA measured 30 feet.
RP2 to GOA measured 43 feet 2 inches.
At 4:26 PM, the perimeter of the GOA was measured (See attachment 3).
Measurements of fire direction indicators from the GOA to indicators was taken (See attachment 3).

At 5:12 p.m. I left the Nuns Fire.

On October 12, 2017 at 7:42 a.m., I arrived at 1210 Nuns Canyon Road.

At 8:00 a.m., [redacted] arrived.

At 8:38 a.m., I took digital photographs of the suspended tree limb resting on utility line and base of tree (IMG_1519-IMG_1560).

At 9:09 a.m., I listened to a voicemail on my state issued cellular telephone from [redacted] In summary [redacted] told me the following. He had spoken to [redacted] who was home the night the Nuns Fire started. [redacted] told [redacted] when he left the residence the night of the fire he could not turn left out of the driveway at 1210 Nuns Canyon Road due to active burning fire near the road and drove right out of the driveway to avoid the fire.

At 10:56 a.m., I called [redacted] using my state issued cellular telephone. [redacted] gave me a contact telephone number for [redacted] I called [redacted] and left a message asking him to return my call.

At 11:41 a.m., I received a phone call on my state issued cellular telephone from [redacted]. I received permission to digitally record our conversation (See attachment 13). [redacted] told me the following in summary. The night the Nuns Fire started he heard a branch break and the electricity went out. He looked out the window of his residence and did not see anything. He was awakened by family members who told him there was a fire. They tried to evacuate toward the highway and could not due to fire. They drove north on Nuns Canyon Road and waited at Calabasas Preserve for the fire to pass. [redacted] saw flames in the meadow toward the highway.

At 11:45 a.m., Arborist [redacted] arrived at 1210 Nuns Canyon. [redacted] evaluated the detached tree top and stem located near the pump house at 1210 Nuns Canyon Road (See attachment 6). In summary [redacted] concluded the tree was an alder and a complete branch failure occurred. Prior to the failure, the health and

condition of the subject tree is judged to be within normal limits for the species. [redacted] provided a written report.

At 1:30 p.m., [redacted] completed his evaluation.

At 2:45 p.m., GPS coordinates (WGS 84) of the fire flag indicators were recorded and documented. (See attachment 3).

At 5:25 p.m., I left 1210 Nuns Canyon Road.

On October 13, 2017 at 7:45 a.m., I arrived at 1210 Nuns Canyon Road.

At 8:00 a.m. [redacted] arrived.

At 10:00 a.m., I walked up and down Nuns Canyon Road and into the burn, re-examining my fire pattern indicators. I confirmed the fire direction of travel based on the indicators I observed. The fire pattern indicators all supported the fire originated from the identified GOA near the pump house at 1210 Nuns Canyon Road.

At 1:25 p.m., Sonoma County Public Works Supervisor [redacted] arrived at 1210 Nuns Canyon Road. He asked permission to clear Nuns Canyon Road north of 1210 of downed trees and debris. Permission was granted. [redacted] was given an ICS 214 to complete and clear and concise instructions to document his purpose and people performing road clearing activities.

At 2:25 p.m., additional Sonoma County Public Works employees arrived at 1210 Nuns Canyon Road. All employees were logged on ICS 214.

[redacted] supervised the Public Works crew during their road clearing activities.

At 5:04 p.m., [redacted] and his Public Works crew completed their road clean up. I received

a filled-out ICS 214 from [redacted] (See attachment 11).

At 5:45 p.m., [redacted] and I left 1210 Nuns Canyon Road.

On October 14, 2017 at 7:45 a.m., I arrived at 1210 Nuns Canyon Road.

At 9:41 a.m., I met with the assigned Light Detection and Ranging (LIDAR) . I briefed them on the fire and gave them an ICS 214 to document their activity for the day.

At 6:20 p.m., the LIDAR team completed their work. I collected a completed ICS 214 (See attachment 11).

At 6:46 p.m., I left 1210 Nuns Canyon Road.

On October 15, 2017 at 7:51 a.m., I arrived at 1210 Nuns Canyon Road.

I took GPS coordinates and digital photographs of the fire's progression (See attachment 3 & IMG_1561-IMG_1570).

At 10:30 a.m., Sonoma Valley Fire Battalion Chief [redacted] arrived at 1210 Nuns Canyon Road. He wanted to evaluate access for fire engines on Nuns Canyon Road. Access was granted. An ICS 214 was given to [redacted] to complete.

At 11:03 a.m., an aerial bucket truck from [redacted] arrived at 1210 Nuns Canyon. The bucket truck was utilized to take aerial photographs of the GOA. I briefed the crew of the bucket truck on the fire and gave them an ICS 214 to complete.
At 11:25 a.m., [redacted] dropped off a completed ICS 214 and left 1210 Nuns Canyon Road (See attachment 11).

The aerial bucket truck was carefully parked outside of GOA, 35 feet to the south.

At 11:50 a.m., I took aerial photographs of the GOA from the bucket of the truck (IMG_1571-IMG_1639).

At 12:40 p.m., I completed my aerial photographs. I received a completed ICS 214 from the aerial bucket truck crew and they left (See attachment 11).

At 2:03 p.m., I contacted the Sonoma-Lake-Napa Unit warehouse to arrange transportation of the downed tree top within the GOA. A stake side truck was needed to transport the downed limb to evidence storage. I measured the length of the tree top with a measuring tape. The length of the tree top exceeded the length of my state issued pickup truck camper shell.

At 2:53 p.m., Hayward Engine 308 (E308) arrived at 1210 Nuns Canyon Road. They were assigned by the division of the fire to mop up a smoke located at 1200 Nuns Canyon Road. The engine was given an ICS 214 to complete and permission to complete their task.

At 4:03 p.m., E308 returned to 1210 Nuns Canyon Road. I received a completed ICS 214 prior to their exit (See attachment 11).

At 4:43 p.m., CAL FIRE Firefighter [redacted] arrived at 1210 Nuns Canyon Road in CAL FIRE LNU utility 1404 (U1404) to assist with transportation of the tree top.

[redacted] assisted with the removal of the downed tree top. I instructed [redacted] to cautiously work around the perimeter of the tree top. [redacted] used a chainsaw to cut the downed tree top into smaller, more manageable sections. He worked around the perimeter of the tree top carefully trying to avoid disturbing the GOA. I was present during the cutting and removal of the tree top. The collected sections of tree top were tagged as evidence E-1 and E-2 (IMG_1640-IMG_1643, IMG_1657) and loaded up in U1404.

At 5:19 p.m., evidence item E-1 and E-2 were transported to CAL FIRE Middletown evidence storage. I followed U1404 to the evidence storage in my state issued pickup truck. I never lost visual sight of U104 during the transportation of evidence.

At 6:48 p.m., I arrived at Middletown evidence storage. I entered evidence item E-1 and E-2 into evidence storage. I received a complete ICS 214 from [redacted] (See attachment 11).

On October 16, 2017 at 8:14 a.m., I arrived at 1210 Nuns Canyon Road.

At 8:35 a.m., I took GPS coordinates of the wooden power poles located in the field near the pump house at 1210 Nuns Canyon road.

At 8:58 a.m., I took digital photographs using my state issued digital camera of the GOA with the tree top removed. The GOA was littered with small twigs and green, brown and charred tree foliage.

At 9:02 a.m., I visually examined the GOA.

I walked around the perimeter of the GOA two times, once clockwise and once counter clockwise looking for micro fire pattern indicators. I observed fire pattern indicators of staining and protection (IMG_1671, IMG_1672). I worked from advancing fire pattern indicators toward backing fire pattern indicators based on the micro fire pattern indicators I observed. The fire appeared to be lower intensity in GOA. I observed dried cured annual grass that was partially consumed by fire and a lack of white ash. The GOA was disturbed by the downed tree top, the tree top foliage contacting the ground within the GOA, and the removal of the tree top.

Based on the fire pattern indicators I observed, a specific origin area (SOA) four feet by four feet in size was located within the GOA. The downed powerline conductor laid in the center of the SOA. I visually examined the SOA. I used a debris removal tool and hovered

a magnet over the SOA. I did not locate or collect any additional items identified by the magnet or visually.

At 2:57 p.m., representatives from Pacific Gas and Electric (PG&E) arrived.

At 3:37 p.m., representatives from the California Public Utilities Commission arrived.

At 4:45 p.m., additional representatives from PG&E arrived to assist with powerline conductor and power pole hardware removal.

I identified three powerline conductors and connecting power pole hardware as items I wanted to collect as evidence. As each item was removed, it was identified by colored tape indicating where it was located prior to removal. Red, white and blue tape was used to identify the span location and white tape with a black marking was used at each end of the powerline conductor to identify which end was on the top side.

At 5:08 p.m., PG&E started removal of power pole hardware and powerline conductors.

The west powerline conductor was wrapped with red tape. The center span was wrapped with white tape and the east span was wrapped with blue tape. The powerline conductor span was measured from power pole to power pole. The total span measured 113 feet 5inches in length and 23 feet off the ground in the center of the span. The center line was identified by PG&E as the neutral wire and the two outside lines were identified as 120 volt lines.

Line spacing between the powerline conductors was measured at the top of the cross arm of each power pole by the PG&E linemen that removed the powerline conductors. The measurements at the south pole were given as 26 inches from outside to center powerline conductor and 62 inches from center to outside powerline conductor. The measurements at the north pole were given as 16.5 inches from outside to center powerline conductor and 62 inches from center to outside powerline conductor.

At 6:20 p.m., I documented evidence items E-3-E-9.

At 6:54 p.m., I placed and secured all evidence items in the camper shell of my state issued pickup truck to transport to the CAL FIRE Santa Rosa evidence storage.

At 7:36 p.m., I arrived at the CAL FIRE Santa Rosa evidence storage.

At 7:40 p.m., I entered all collected evidence items into storage.

On October 18, 2017 at 6:54 p.m., I arrived at 1210 Nuns Canyon Road. I met with CAL FIRE Investigator [redacted] and private fire investigator hired by PG&E, [redacted] showed [redacted] where he believed the Nuns Fire originated prior to my arrival. [redacted] showed me [redacted] findings. [redacted] and I agreed to revisit [redacted] findings the next morning.

On October 19, 2017 at 8:34 a.m., I arrived at 1210 Nuns Canyon Road. I met with [redacted] We examined the identified SOA [redacted] had identified the previous day. In the SOA laid a downed powerline conductor. [redacted] concluded the downed powerline conductor ignited the Nuns Fire. I did not agree with [redacted] findings based on the following: When I arrived at the Nuns Fire I walked out Nuns Canyon Road to the fire's edge. The fire's edge was located to the south of where [redacted] identified his SOA. I had walked to end of Nuns Canyon Road following out the span of suspended powerline conductors. The downed powerline conductor [redacted] identified was suspended when I walked out the road on October 10, 2017. I took GPS coordinates (WGS 84) using my state issued GPS device of [redacted] SOA. The GPS coordinates were N 38 23.900 by W 122 30.740. I took GPS coordinates at the location where I observed the fire's edge on October 10, 2017. The coordinates were N 38 23.892 by W 122 30.805.

On December 18, 2017 CAL FIRE Assistant Chief [redacted]

[redacted] emailed me a link containing California Public Utilities Commission published electric safety incident reported by PG&E. In summary, the report states on October 16, 2017 PG&E identified a tree top that broke and fell on an open secondary service at 1210 Nuns Canyon Road. (See attachment 12).

On March 8, 2018 at 1:55 p.m., I met with electrical engineer [redacted] of [redacted] and I reviewed photographic documentation of evidence items that had been collected at the Nuns Fire. In summary [redacted] told me the following: The wire strand ends of the downed powerline conductor displayed penciling at the tips, an indication of tension break in the line and beads of melted metal indicating arc marking that would be present at a temperature of 1200 degrees Fahrenheit (IMG_1675 & IMG_1676). Evidence item E-3, section of tree limb, displayed arc tracking indicating that section of the tree came in contact with a heat source.

On May 21, 2018 at 9:00 a.m. I received a CAL FIRE LE 71 from [redacted] The LE 71 contains requests made by [redacted] to PG&E for data (See attachment 9). All the data is stored on a thumb drive located in the CAL FIRE Santa Rosa evidence storage.

On May 25, 2018, I received a CAL FIRE LE 71 from [redacted] The LE 71 contains additional requests made by [redacted] to PG&E for data (See attachment 9). All the data is stored on a thumb drive located in the CAL FIRE Santa Rosa evidence storage.

On May 25, 2018, I received data from PG&E that contained the Nuns Incident Description & Factual Summary. Within the summary, PG&E states two smart meters located downstream from 1210 Nuns Canyon Road both reported a Last Gasp event at 10:18 p.m. on October 08, 2017. At 10:51 p.m. on October 08, 2017 Line Recloser 47964 operated and reclosed, resulting in an approximately 10-second outage at 1210 Nuns Canyon Road. At approximately 12:01 a.m. on October 09, 2017 the Dunbar 1101 Circuit Breaker was remotely opened and de-energized (See attachment 12).

Opinions and conclusion:

Based on my training, education, experience, and facts gathered during my origin and cause investigation, I determined the Nuns Fire was ignited due to a tree top contacting an energized powerline conductor causing the powerline conductor to come in contact with a receptive fuel bed.

Transfer of digital photographs:

I transferred 359 photographs (IMG_1326-IMG_1684) that I had taken from my assigned digital camera to digital video disc on October 19, 2017 at 3:25 p.m.. I made a second digital video disc using the same process. I did not alter the photographs during this process. I labeled the digital video disc with "Digital Photographs Copy #1 and "Digital Photographs Copy #2".

Transfer of digital voice recording:

I transferred a digital voice recording of my interview with [redacted] to a digital video disc on October 19, 2017 at 5:05 p.m. I made a second digital video disc using the same process. I did not alter the digital voice recording during this process. I labeled the digital video disc with "Digital voice recording copy #1 and digital voice recording copy #2".

*I reserve the right to reexamine this report if additional information is discovered or provided to me that could amend or reinforce my opinions or conclusions.

END REPORT

[redacted]

Fire Captain, CAL FIRE

10 - ATTACHMENTS:

1. CAL FIRE FC 34 Dispatch Action Report
2. Fire perimeter map
3. Incident sketches
4. Weather
5. Forestry Assistant II site report
6. Arborist site report
7. Photographs
8. Evidence log
9. CAL FIRE LE 71 Supplemental report
10. CAL FIRE LE 78a Witness Statement
11. ICS 214's
12. Utility reports
13. Digital video discs
    -Damage Inspection Summary Report
    -Digital Photographs
    -Digital Voice Recording
    -LIDAR

ATTACHMENT B

CAL FIRE Arborist Report by Mark Porter

Mark Porter, Mark's Tree Service and Consulting
ISA Certified Arborist # WE465
markstree@iCloud.com

member

Evaluation of Alder Tree Failure
1210 Nuns Canyon Road
Glen Ellen, CA

Prepared for Cal Fire Investigator Kyle Steis

October 12, 2017

Table of Contents

Summary

A tree failure occurred on October 8, 2017 at 1210 Nuns Canyon Road, Glen Ellen, California. A 56,556 acres wildfire occurred in the area and extensive damage on the property took place.

I was asked to inspect the site and assist in the investigation of the tree failure. The type of tree failure that occurred at this property was a branch failure of a white alder tree. Several branches from the subject tree **fractured**[1] in the wind.

On October 12, 2017 I visited the site with Cal Fire Investigating Officers Kyle Steis and Greg Roath, made some notes and took some photographs. It is my professional opinion the branch fractures are a result of excess load exceeding material strength of the wood. Wood strength is compromised since wood decay diagnostic results report the fungal decay Stereum is present (see- Appendix IV). In addition, I observed branches in close proximity to conductors. Abrasion marks can be seen on broken branches found on the ground next to the subject tree. These abrasion marks appear to indicate clearance issues not attended to.

Neighboring trees with clearance issues near energized conductors illustrate conditions that were present during my site inspection and at the time of the branch failures.

Introduction

Background

On October 8, 2017, at 10:00 PM the Nuns Fire (or Central LNU Complex) occurred. It is my understanding the Nuns fire burned 56,556 acres (see - APPENDIX I Cal Fire Incident Report).

It was reported to me a tree failure occurred on or around October 8, 2017 at 1210 Nuns Canyon Road, Glen Ellen, California (see- Appendix II Site Overview). October 12, 2017, I met with Cal Fire Investigating Officer Kyle Steis and Greg Roath at this site to assist with the investigation.

Assignment

I was asked to:

1. Visit the site where the tree failed.

[1] *Words in bold print apart from section headings, may be unfamiliar to the reader, therefore, are defined in the Glossary.*

2. Provide my professional opinion of the circumstances or conditions that led to the failure of a white alder tree on this site

3. Document my observations in a report.

Limits of Assignment

Extensive damage on the property took place. The type of and extent of damage is not included in this report. The cause of the fire on and surrounding this property is also not included in this report. This report focuses on the subject and neighboring trees I was asked to look at.

Purpose and Use of Report

To assist Cal Fire with the tree failure investigation.

Observations

Site

I visited the site on October 12, 2017. The subject tree is a white alder (*Alnus rhombifolia*). Two broken branches (approximately 6 and 7 inches in diameter) lay on the ground close to the subject tree (see Photos 1-5). Diameter at breast height of the alder tree is approximately 14 inches. **Crown** shape is full and appears normal for the species. The fractures occurred away from a connection (union) to the trunk or another branch.

Several native trees grow along with the subject tree in a creek, in line, and close to the subject tree. Above the creek there are high voltage power lines. Existing vegetation from neighboring trees overhang the wires and are currently in direct contact. Complete branch failures occurred as well as partially broken branches still hang in the subject tree. I observed wires are near the broken tree branches. The property and neighboring properties was evacuated because of the wildfire.

Significant Finding. Branches from the canopy of the subject tree have been in contact with electric wires. Branch abrasions approximately 2 feet apart are present and appear to be approximately the same width of power line wires. **Lidar** measurements of the distance between lines may be helpful. Conditions as of the date of inspection can be seen in Photos 7, 11 & 12. Cal Fire Investigators Kyle Steis and Greg Roath pointed out the abrasions present on fallen branches from the subject alder tree (see Photos - 6,8,9, & 10). There are no other cables or wires present in the vicinity that would be responsible for those abrasion marks.

The **fracture point** on the subject tree branches exhibit splintered wood**.** The wood appears to have a slight yellowing of color. This can be seen close to the outside margin of a broken branch (see Photo 4 at blue arrow). Wood decay diagnostic results report the presence of Stereum fungi.

Observations of **branch and trunk defects** were difficult to find however, I observed scrape marks that I believed to be significant. Prior to the failure the health and condition of the subject tree is judged to be within normal limits for the species.

Species Information[2]

- White alder (*Alnus rhombifolia)*
- Native to California, Western North America from the Sierra Nevada to Montana.
- Relatively tolerant of heat and wind in landscaped areas.
- Has Deciduous foliage.
- Height: 50 - 90 feet.
- Width: 40 - 70 feet.
- Growth Rate: 36 or More Inches per Year.
- Longevity 40 to 150 years.
- Branch Strength Rated as Medium.
- Fire Resistance is Favorable.

Discussion

The alder branches failed due to a combination of factors, such as the elasticity limit of the wood was reached during a moment of increased pressure. This means that the combination of branch foliage weight and wind dynamics combined to create pressure that was simply too great for the branch to maintain. The lab reports Stereum is a decay fungus of later stages of decay. Wood decay is known to weaken the strength of tree parts and lead to branch failure.

The alder species is given a 'medium' branch strength within the researcher reported information. This is very general and branch strength could also be considered low when combined with other factors, such as previous pruning history, location of the branch within the canopy, overall branch length, as well as disease. It is not reported how the strength is measured, compared to, or determined. The **consequences of failure** associated with alder species is not as dramatic as some large statured species, yet branch failures are common in native trees. Alder species is a host to Stereum spp. (Parchment Fungus). It is reported to be commonly found on dead trees, branches, and stumps. The broken branch may have been previously wounded before complete failure since the mode of infection enters branch stubs and wounds (Sinclair).

Researchers study tree biomechanics trying to better understand how branches break. Attempts to predict failures are improving with research, yet it is far from an exact science. Tree failure reporting statistics in California informs us that branch failures are often associated with defects. Load limits and wood properties are useful to look at yet limited. The factors of tree failure are many and variable. Decay fungi is recognized as a pathogen that weakens wood strength.

[2] Urban Forestry Ecosystem Institute – http://selectree.calpoly.edu/tree-detail/alnus-rhombifolia

Other Conditions of Concern

The branches in close proximity to the wires are serious concern for safety during line clearing events. Additionally, equally serious or more so than branch defects.

As a line clearance foreman, for one of the largest utility contractors in the country (circa 1980s), I recall work orders showing a specific area to schedule work called a grid. The work order listed locations of trees with branches touching and overhanging the wires. Those marked as ***"H"*** are for hot (touching the wires) and ***"OH"*** marked as overhang (overhanging the wires.

The utility companies want those ***H*** trees and ***OH*** trees cleared. The ***hot trees*** are dangerous and can send a quick alarming shock through the body if a climber comes in contact, even if the climber is a considerable distance away. Electrocution is a real possibility. Insulated aerial lift trucks offer the operator a bit more protection, yet the worker must exercise extreme caution. It's very important to make small controlled cuts to clear energized wires of *Hot* branches and especially *Overhangs*.

The *Overhang trees* are extremely dangerous for electrocution potential, knocking wires down, and even creating a fire. Hot trees can start a fire in the tree if the foliage is dry enough and spread to surrounding flammable material. Even a slight breeze can cause direct contact with a branch and energized conductor. As the branch and the energized conductor touch the sizzling noise can be heard and flash of fire can be seen.

Recall that at the time of my site inspection I observed trees surrounding the subject tree that are both *hot* and *overhang* the high voltage electric wires (see - photos 7, 11, and 12). Because of the abrasions seen on the branches in photos 8, 9, and 10, I believe it is reasonable to conclude that dangerous conditions were present prior to the failure.

The Mode of Failure

There are three primary modes or classification of tree failure (California Tree Failure Report Program) *branches, trunk, and root.* The failure at this site is a <u>branch failure.</u>

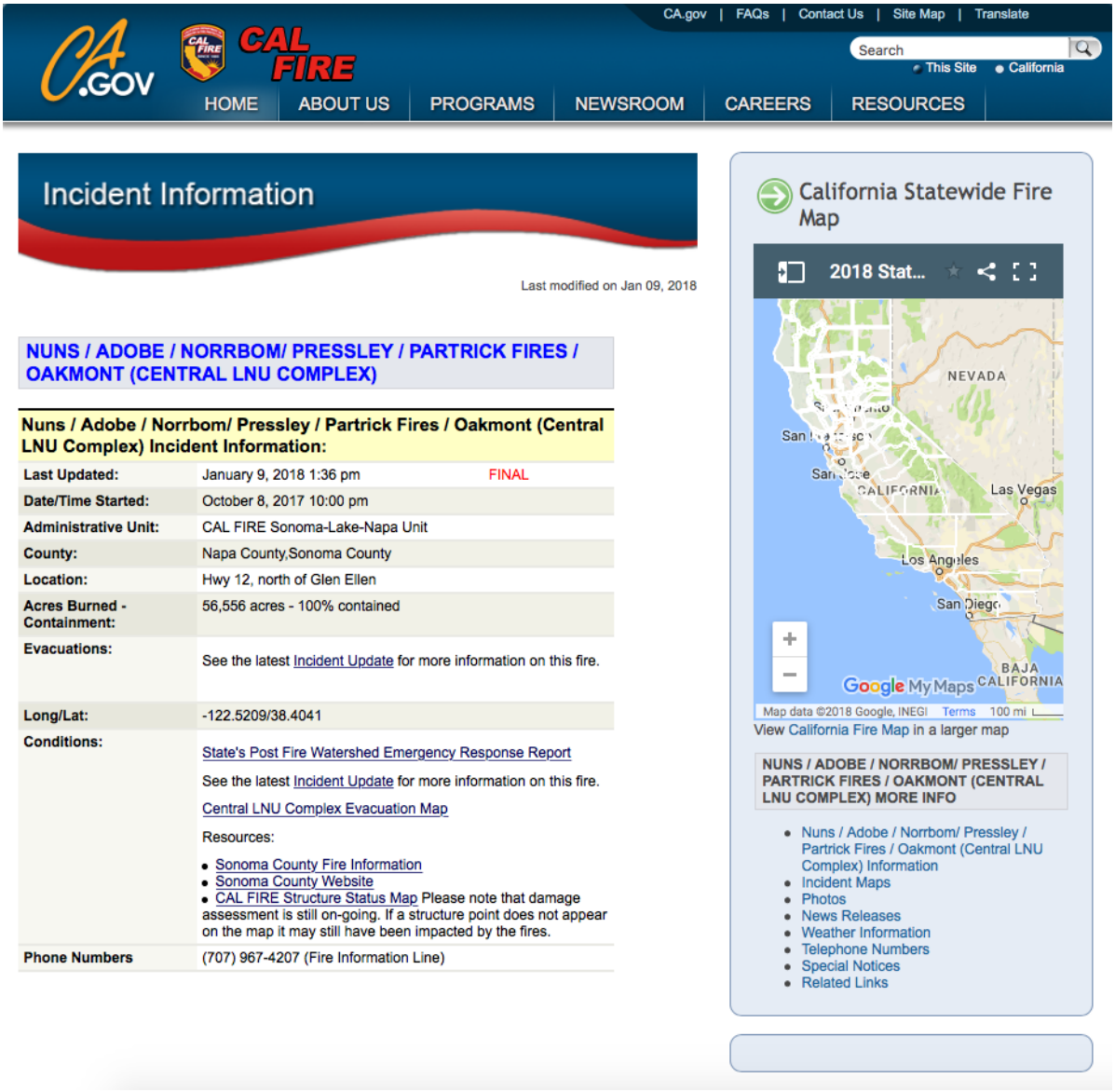
Conclusion

It is my professional opinion the branch fractures are a result of excess load exceeding material strength of the wood. Wood strength is reduced with the presence of decay organisms confirmed by DNA lab results.

Abrasion marks are evident on broken branches found on the ground adjacent to the subject tree. These abrasion marks appear to indicate clearance issues not attended to.

Neighboring trees with clearance issues near energized conductors illustrate similar conditions that were present during my site inspection and at the time of the branch failures.

Appendix I Cal Fire Incident Information -



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Incident Information

Last modified on Jan 09, 2018

NUNS / ADOBE / NORRBOM/ PRESSLEY / PARTRICK FIRES / OAKMONT (CENTRAL LNU COMPLEX)

Nuns / Adobe / Norrbom/ Pressley / Partrick Fires / Oakmont (Central LNU Complex) Incident Information:

Last Updated:	January 9, 2018 1:36 pm FINAL
Date/Time Started:	October 8, 2017 10:00 pm
Administrative Unit:	CAL FIRE Sonoma-Lake-Napa Unit
County:	Napa County,Sonoma County
Location:	Hwy 12, north of Glen Ellen
Acres Burned - Containment:	56,556 acres - 100% contained
Evacuations:	See the latest Incident Update for more information on this fire.
Long/Lat:	-122.5209/38.4041
Conditions:	State's Post Fire Watershed Emergency Response Report See the latest Incident Update for more information on this fire. Central LNU Complex Evacuation Map Resources: • Sonoma County Fire Information • Sonoma County Website • CAL FIRE Structure Status Map Please note that damage assessment is still on-going. If a structure point does not appear on the map it may still have been impacted by the fires.
Phone Numbers	(707) 967-4207 (Fire Information Line)

California Statewide Fire Map

View California Fire Map in a larger map

NUNS / ADOBE / NORRBOM/ PRESSLEY / PARTRICK FIRES / OAKMONT (CENTRAL LNU COMPLEX) MORE INFO

- Nuns / Adobe / Norrbom/ Pressley / Partrick Fires / Oakmont (Central LNU Complex) Information
- Incident Maps
- Photos
- News Releases
- Weather Information
- Telephone Numbers
- Special Notices
- Related Links

Appendix II Site Oberview

1210 Nuns Canyon Road
Glen Ellen, CA
Approximate location of tree failure

Appendix III Photos

Photo 1 –subject tree

Photo 2 - fractured branches from subject tree

Photo 3 - fractured branches from subject tree

Photo 4 – close up of fractured branches. Splintered wood in area of fracture. .

Photo 5 – closer view of splintered wood.

Photo 6 – discolored broken branch

Photo 7 existing conditions of clearance

Photo 8 – abrasion marks on fallen branch approximately 2 feet apart

Photo 9 – close-up of abrasion marks on fallen branch observed from subject tree

Photo 10- abrasion mark on fallen branch point of contact

Photo 11 - existing conditions of clearance. Trees along span in contact with wire and overhanging.

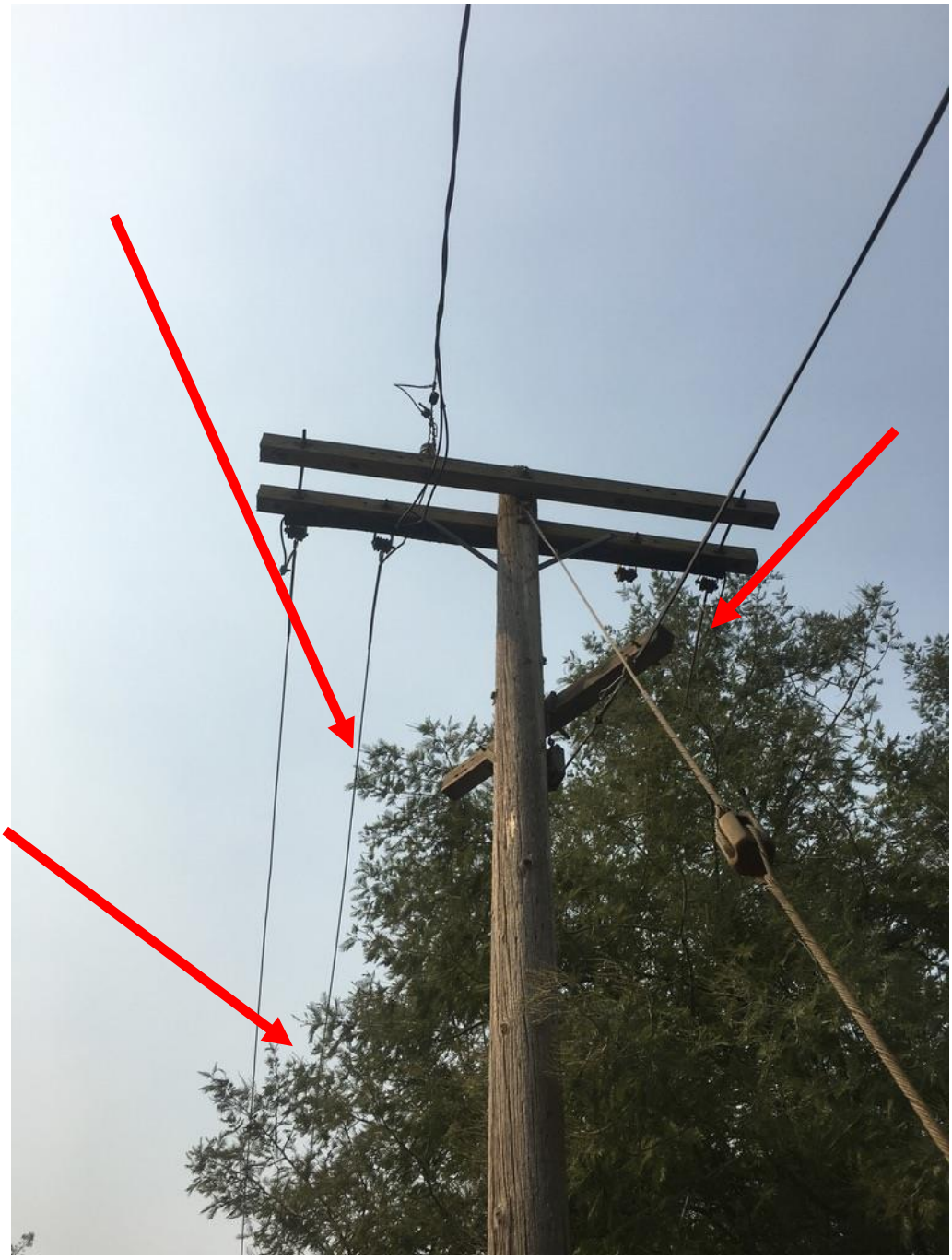

Photo 12 - existing conditions of clearance. Trees along span in contact with wire and overhanging.

Appendix IV Wood Decay Lab Results

Forest Pathology and Mycology Laboratory UC Berkeley
Wood Decay Diagnostic Results

ID Code:	Marks Tree 6
Submitted by:	Mark Porter
Collection Date:	
Received Date:	12/14/2018
Tree Species:	Alnus rhombifolia
Location:	
Reason For Submission:	

Targets	Results
1. Fungal DNA	x
2. *Armillaria* spp.	
3. *Fomitiporia* (*P. punctatus, P. robustus*)	
4. *Fuscoporia* (*P. contiguous, P. gilvus, P.*	
5. *Ganoderma* spp.	
6. *Ganoderma adspersum*	
7. *Ganoderma applanatum*	
8. *Ganoderma lucidum* (Eu)	
9. *Ganoderma resinaceum*	
10. *Hericium* spp.	
11. *Inocutis* (*I. dryophilus*)	
12. *Kretzschmaria deusta*	
13. *Inonotus dryadeus*	
14. *Inonotus* s.s. (*I. andersonii, I. hispidus*	
15. *Inonotus/Phellinus* spp.	
16. *Laetiporus* spp.	
17. *Perenniporia fraxinea*	
18. *Phellinus* s.s. (*P. igniarius, P. lundelii,*	
19. *Pleurotus* spp.	
20. *Schizophyllum* spp.	
21. *Stereum* spp.	x
22. *Trametes* spp.	

Sample Positive for: Stereum

Notes:
Normally Stereum is a decay fungus of later stages of decay.

Glossary

Advanced decay: A stage of decay, at which point all wood strength and cell structure has been lost.

Branch and trunk defects: Cavities, nesting holes. decay conks, old wounds, multiple branches arising at one level, dead branches and hangers, weakly attached branches from topping cuts, multiple pruning wounds from poor weight distribution, codominant branches with embedded bark, flat area on trunk with no basal flare, canker (Clark J. Matheny M. 1993. *A Handbook of Hazard Tree Evaluation for Utility Arborists)*

Crown: upper part of the tree, measured from the lowest branch, including all the branches and foliage.

CTFRP: The California Tree Failure Report Program

California Tree Failure Database: The California Tree Failure Report Program (CTFRP) was established in 1987 to collect quantitative information on the mechanical failure of urban trees (trunk breaks, branch breaks, and uprootings). This information is used to develop "failure profiles" for genera and species to more accurately assess failure probability in standing trees and thereby reduce failure potential in urban forests.

Conk: Fruiting body or non-fruiting body of a fungus. Often associated with decay. Woody or leathery spore-producing body of wood decay fungi, generally forming on the external surface of branches and trunks.

Fracture: Referring to the breakage of a branch, trunk, or root.

Fracture point: The location where the branch, trunk, or root snapped, splinted, or simply broke. 1. A point of fracture or fracture location. 2. In this report, a point of failure or failure point.

Consequences of Failure: Negligible, Minor, Significant, Severe.

Incipient decay: The beginning stages of decay where discoloration starts to occur. Fungus has just started to break down the cell walls and has only lost a small amount of its strength. In the *intermediate decay* stage the wood begins to become discolored and the strength of the wood has been significantly compromised, but the cell walls remain intact. After many years (the amount of time depends on tree species) the wood reaches the **advanced decay** stage, at which point all wood strength and cell structure has been lost.

Intermediate decay: Wood begins to become discolored and the strength of the wood has been significantly compromised, but the cell walls remain intact.

Lidar: a method of detecting distant objects and determining their position and velocity, or other characteristics by analysis of post laser light reflection from their services. Lidar operates on the same principles of radar and sonar

Mode of Failure: when trees fail there are three modes of failure. *Roots, trunk, or branch*. The failure modes describe the type of failure that has occurred. Certain species with known failure profiles help managers make informed decisions to reduce the risk of tree failures.

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Assumptions and Limiting Conditions

1. Any legal description provided to the consultant/appraiser is assumed correct. Any titles and ownerships to any property are assumed good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations.

3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

4. The consultant shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

5. Loss or alteration of any part of this part of this report invalidates the entire report.

6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior express written or verbal consent of the consultant/appraiser.

7. Neither all nor any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without my prior expressed written or verbal consent.

8. This report and any values expressed herein represent my objective and independent opinion. My fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

9. Sketches, diagrams, graphs, or photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

10. Unless expressed otherwise: information contained in this report covers only those items that were examined and reflects the condition of those items at the time of photographic inspection.

Certificate of Performance

I certify that the statements made in this report to be true and correct to the best of my knowledge. The opinions expressed are my personal, unbiased professional opinions and conclusions, and I have no present or prospective interest in the vegetation that is the subject of this report. I have no personal interest or biases with respect to the parties involved, and have based my assessment on the situation as I have seen it.

My compensation is not contingent on the reporting or a predetermined outcome or direction that favors the cause of the client, the attainment of a stipulated result, or the occurrence of a subsequent event.

My opinions and conclusions were developed, and this report prepared in conformity with standard arboricultural practices, my expertise, and experience. If further documentation or evidence is reviewed, these opinions could be changed, altered, or maybe strengthened.

I further certify that I made a personal inspection of the property, and no one provided any significant professional assistance to this report.

Mark Porter, Consulting Arborist

ATTACHMENT C

CAL FIRE Forester Report by Jeremiah Steuterman

DEPARTMENT OF FORESTRY AND FIRE PROTECTION

Jeremiah Steuterman
Forestry Assistant II
Boggs Mountain Demonstration State Forest
PO Box 839
Cobb, CA 95426
(707) 928-4378
Website: www.fire.ca.gov

Site 1of 2

Date of visit: 10/11/2017

Location:
Nuns Canyon Rd
Glen Ellen, CA
95442

Prevention Officer: Kyle Steis

Stand Description:

The stand features typical California native riparian zone vegetation adjacent to a perennial watercourse. The tree species present in the stand include Red Alder (*Alnus rubra*), Canyon Live Oak (*Quercus crysolepis*), and California Bay Laurel (*Umbellularia californica*).

No insect damage or pathogens were observed in the stand.

Species Description:

Red Alder is a medium sized deciduous tree typical of riparian zone habitats in Northern California. The leaves are ovate, with bluntly serrated edges that roll under at the margin, distinguishing it from other species of alder. The bark is mottled, gray, and smooth.

Individual Tree Description:

Diameter: 13.6” at breast height (4.5’ from root collar) (Figure 1)
Height: Unable to be safely determined at time of site visit

Diameter of broken top: 8.1” diameter (Figure 2)
Diameter of broken branch: 6.0” diameter (Figure 3)

The top of this tree had broken off and fallen to the ground directly below the main stem of the tree (Figure 4).

No evidence of rot or loss of structural integrity.

No insects or pathogens observed affecting the tree (Figure 5). Cut branches near the top of the tree indicate that this tree had been pruned in the past, though no infections were observed at these sites.

Figure 1: Diameter of tree taken at breast height (4.5’ from root collar).

Figure 2: Diameter of broken top.

Figure 3: Diameter of broken branch.

Figure 4: View of broken top of tree from below.

Figure 5: Close up of the broken end of the tree top. No decay or insect activity observed.

Site 2 of 2

Date of visit: 10/11/2017

Location:
Nuns Canyon Rd
Glen Ellen, CA

95442

Prevention Officer: Kyle Steis

Stand Description:

The vegetation is typical of Northern California oak woodland along the margins of the riparian zone associated with a perennial watercourse. The predominant tree species present include California Bay Laurel (*Umbellularia californica*), Canyon Live Oak (*Quercus chrysolepis*), Pacific Madrone (*Arbutus menziesii*), and Douglas Fir (*Pseudotsuga menziesii*). This stand features an overstory of primarily codominant hardwood trees with isolated dominant mature Douglas Firs. The tree in question is on the outer margins of the riparian zone associated with Calabazas Creek, a perennial watercourse draining to Sonoma Creek.

Evidence of past forest management activities are visible on the hillside above Nuns Canyon Road. Old skid trails are present, likely from past harvest entries, but do not appear as though they have been used by equipment in the last decade (Figure 7).

Pink flagging was seen hanging adjacent to the old skid trail, though the sun bleached and faded color suggests that it was not hung recently (Figure 8). The type and quality of flagging used, including degree of exposure to the sun can have a variable effect on aging, and so a reliable age for the flagging cannot be given. No stumps indicating a recent harvest entry were observed, though some decayed stumps and stump sprouting hardwoods were observed in the stand.

One young tree had a blue number tag hammered into the bole of the tree at breast height, though the tree has begun to grow around the tag, suggesting it is several years old (Figure 9). The degree to which the bark will grow over a number tag is dependent on how deeply the tag was nailed in, so a reliable age for the installation of this tag cannot be given. This practice is typical of forest inventory and measurement, and further suggests active management of this stand in the last few decades.

Observed along Nuns Canyon Rd were several small trees with the tops cut off and stubs of pruned branches on the larger trees bordering the utility lines. Most of these trees featured a bright green mark at breast height on the bole of the tree, indicating they had been selected for this treatment.

Figure 6: View of the fallen Bay Laurel tree from Nuns Canyon Road.

Figure 7: Old skid trail on the hillside above Nuns Canyon Road.

Figure 8: Aged pink flagging along the old skid trail shown in Figure 7.

Figure 9: Blue number tag hammered into the bole of a small tree in the stand. This is a practice typical of forest inventory.

Species Description:

California Bay Laurel (*Umbellularia californica*) is a native, monotypic, hardwood tree or shrub common to riparian areas, oak woodlands, and lower elevation mixed conifer forests of Northern California. The shrub form is most common on drier sites, while the trees reach their greatest heights on deep alluvial soils associated with perennial watercourses. The leaves of this species are glossy, dark yellow-green, thick, and leathery. The tree is most easily identified by the strong peppery, menthol-like odor the leaves give off when crushed.

Individual tree description:

Diameter: 15” at breast height (4.5’ from root collar) (Figure 10).
Height: Unable to be safely determined at time of site visit

Tree has horizontal cracks at the base that extend into the sapwood (Figure 11). These could be possible chain saw marks, but the upward curve at the margins suggests that there may be some other cause as well.

There is clear evidence of rot in the bole of the tree (Figure 12). It is common for the heartwood of hardwood trees in this area to rot from the inside out.

The heart rot in this tree severely impacted the center of the tree, leading to extensive decay and loss of structural integrity, as evidenced by the significant cavity in the center of the bole, and the fine powdery texture and black/dark brown color of the wood along the margins of the cavity. The spongy brittle nature of the wood extending away from the cavity indicates that the fungus had spread away from the heartwood and deeply into the sapwood (Figure 13). The extent of the

decay within the bole of the tree is furthered evidenced by the fine powdery decayed wood that can be seen in the vertical cracks in the bark of the tree (Figure 14).

No conks or visible sporophytes were observed on the outside of the bole, though sections of the bole were severely burned and these indicators of rot may have been present before the fire.

There is evidence of a previous scar on the bole of the tree that was closed over by the bark as the tree grew (Figure 15). The cause of the previous injury to the tree is unclear at this time. The scar could have served as an entry point for the fungal pathogen, but that chain of events is unclear at this time.

Figure 10: Diameter of the tree at breast height (4.5’ from root collar)

Figure 11: Horizontal cracks visible at base of tree. The width of the cracks and the depth they extend into the sapwood are possible indicators of saw marks, however the upward curve at the margin and diminishing width suggest that may not be the case.

Figure 12: Heart rot clearly visible in the bole of the tree.

Figure 13: Spongy, light weight sapwood clearly indicates spread of the fungal infection beyond the heartwood.

Figure 14: Fine, powdery, decayed wood visible in cracks in the bark of the tree clearly indicates advanced stages of decay.

Figure 15: Change in color and texture indicate an old scar that was closed over as the tree grew.

ATTACHMENT D

CAL FIRE Evidence List

EVIDENCE LOG

STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY AND FIRE PROTECTION
LE 75e (REV. 7/2011)

INCIDENT NUMBER
17 CALNU 010049
CASE NAME
Nuns

DAY	MONTH	DATE	YEAR	COUNTY	REGION	UNIT	CASE NUMBER
SUN	OCT	08	2017	Sonoma	CNR	LNU	17CALNU010049

ITEM NO	DATE COLLECTED	TIME COLLECTED	COLLECTED BY	ITEM DESCRIPTION	LOCATION
E-1	15	5:05 PM	K.STEIS	Section of tree limb	Scene
E-2	15	5:05 PM	K.STEIS	Section of tree limb	Scene
E-3	16	6:20 PM	K.STEIS	Section of tree limb	Scene
E-4	16	6:25 PM	K.STEIS	Short section of wire	Scene
E-5	16	6:31 PM	K.STEIS	Wood pin	Scene
E-6	16	6:33 PM	K.STEIS	Center phase wire	Scene
E-7	16	6:34 PM	K.STEIS	East span powerline conductor	Scene
E-8	16	6:36 PM	K.STEIS	West span powerline conductor	Scene
E-9	16	6:38 PM	K.STEIS	West span wood pin and conductor	Scene

PRINTED NAME	SIGNATURE	BADGE NUMBER	DATE
Kyle Steis	Kyl Stes	2125	10/29/2017

OFFICER INITIALS KS

ATTACHMENT E

PG&E Work Order #113271607

Electric Overhead Tag

Notification #: 113271607
PM Order #: 43117112
Date Required: 12/22/2017

Priority: B **Sub Priority:** FS
Date Identified: 09/22/2017

Identified in Field By:	TRGA	Plat:	JJ3317
Street Address:	1210 NUNS CANYON RD	Circuit:	04307-1101, DUNBAR
		SSD:	47964
City:	GLEN ELLEN	Equipment #:	
Cross Street:	NELLIGAN RD	Pin #:	
Division:	Sonoma	Pole #:	
Latitude:	38.396178000000	OIS #:	
Longitude:	122.515158000000-	SAP Func. Location:	ED.44-JJ33170000.STRU.POLE
Description:	TREE_CLER_REMV - 1210 Nuns Canyon Rd Gle	SAP Equipment:	101993035
		Accessibility Tier:	

Item Details

	Facility Type	Damage	Cause	Action
Item 1	TREE Tree/Vine	CLER Clearance Impaired		REMV Remove
	☐ Completed ☐ Canceled			
Item 2	GUY Guy	OVRG Overgrown		TRIM Trim
	☐ Completed ☐ Canceled			

☐ Pole Test Sheet

User Status

Conductor/Operating Information		Field Identification		Field Condition (Exposure)		Field Condition (Accessibility)		Other	
Status	**Description**	**Status**	**Description**	**Status**	**Description**	**Status**	**Description**	**Status**	**Description**
SEC	Secondary	INSP	Inspection	XMPT	Exempt from Past Due	NOAC	No Road Access	JAR	Job JAR
CLR	Clearance Required			REMT	Remote Area			GO	General Order
JPOL	Joint Pole			FMOB	Submitted from Mobile				
OH	Overhead								

Job Estimates

Est. Total Hrs. to Complete: 1
Main Work Center: STROSA, Santa Rosa
Funded Repair Date:

Issued To

Est. Electric Crew Size: 02
Gas Crew Size: 00
WTC: 540, KAA_OH Genl CorrectMaint Tag
MAT: KAA, OH Genl CM Tag

Reviewed By: _____ Date of Field Review: _____

Completed or Canceled in Field By (LAN ID): ☐☐☐☐ If No LAN ID Last Name, First Name: _____

Complete or Cancel Date: _____ Actual Hours: _____ *Check One: PG&E Crew ☐ T-Man ☐ Contractor ☐

*Check One: Completed ☐ Canceled ☐ Found Completed Upon Arrival ☐

Signature: _____

I verify that all maintenance on this notification is addressed (completed, canceled, or found completed upon arrival)

*Public Safety & Regulatory Reviewer: If notification was canceled, check one (required):

☐ **CONV:** Converted to another Notif-Type
☐ **DUMM:** "Dummy" for order only
☐ **DUPL:** Duplicate EC for Same Location
☐ **EROR:** Created in Error (Desk Cancelation)
☐ **NCOA:** All Found Completed/Resolved on Arrival
☐ **NOCR:** No Compelling/Regulator Condition Exist
☐ **PROG:** Completed under another Program

Electric Overhead Tag

Notification #: 113271607
PM Order #: 43117112
Priority: B **Sub Priority:** FS
Date Identified: 09/22/2017 **Date Required:** 12/22/2017

List of Tasks on Notification

Field Comments:

Comments

09/22/2017 09:33:07 PST AIMOBILECPIC (AIMOBILECPIC)
- Location : 2
Big tree fell over on to sec wire mid span between last to svc poles,
lots of strain on 1 phase. Remove tree off sec wire. Open
tx for safety.
Trim tree around pole and above guy bob.
09/25/2017 13:44:25 PST [redacted] (AJGD)
* 09/25/2017 13:44:25 PST [redacted] (AJGD)
Reason: Inspector recommended repair date or priority
10/03/2017 07:49:12 PST [redacted] (R1C9)
43117112E: PRINTED JOB FOLDER. JOB FOLDER TO CARTER TO FIELD.
10/05/2017 09:55:29 PST [redacted] (LJL3) Phone [redacted]
SET UP SHUTDOWN FOR DAVEY TREE
11/19/2017 10:15:04 PST [redacted] (LJL3) Phone [redacted]
PS&R DESK/FIELD REVIEW IN PROGRESS PER [redacted]
11/28/2017 13:50:09 PST [redacted] (MAR4) Phone [redacted]
.
11/28/2017 15:20:42 PST [redacted] (MAR4) Phone [redacted]
112817: HJG4: Per revised exemption process, reviewed by Centralized
Gatekeeper to be low potential risk and approved for further exemption.
WO0000003336260

FDA		New	Priority	Comp
Anchor				
Broken/Damaged	Repair		E	
	Replace		E	
Corroded	Repair		E	
	Replace		E	
Missing	Install		F	
Soil/Eroded/Graded	Adjust		F	
	Replace		F	
Animal Mitigation				
Mitigation Missing	Install		E	
Bird Protection				
Bird Protection	Replace		E	
CB Pole				
Broken/Damaged	Replace		F	
Burnt	Replace		E	
Decayed/Rotten	Replace		F	
Booster/Regulator				
Broken/Damaged	Repair		E	
	Replace		E	
Burnt	Repair		E	
Excessive Operation	Overhaul		E	
Leaks/Seeps/Weeps	Clean		E	
	Repair		E	
	Replace		F	
Capacitor				
Broken/Damaged	Repair		E	
	Replace		E	
Burnt	Repair		E	
	Replace		E	
Leaks/Seeps/Weeps	Clean		B	
	Repair		E	
	Replace		E	
Climbing Space				
Obstructed	Adjust		F	
	Replace		F	
Conductor				
Broken/Damaged	Repair		E	
	Replace		E	
Burnt	Repair		F	
	Replace		F	
Clearance Impaired	Adjust		E	
	Install CL Pole		F	
	RayChem		E	
Floater	Repair		E	
Idle Facilities	Remove		F	
Improper Connection	Adjust		E	
Overloaded	Test		F	
Sag/Clearance	Adjust		F	
	Replace		F	

FDA		New	Priority	Comp
Connector				
Burnt	Replace		E	
Corroded	Repair		E	
	Replace		E	
Temp Differential	Replace		E	
	Replace		F	
Crossarm				
Broken/Damaged	Repair		E	
	Replace		E	
Burnt	Repair		E	
	Replace		E	
Decayed/Rotten	Repair		E	
	Replace		E	
Cutout				
Broken/Damaged	Repair		E	
	Replace		E	
Clearance Impaired	Adjust		F	
Flashed	Repair		E	
	Replace		E	
Decorative Streetlight				
Broken/Damaged	Replace		E	
Missing	Install		E	
Fault Indicators				
Broken/Damaged	Replace		E	
Ground				
Broken/Damaged	Repair		B	
	Replace		B	
Exposed	Repair		F	
Missing	Install		E	
Guy				
Broken/Damaged	Repair		E	
	Replace		E	
Clearance Impaired	Adjust		F	
Corroded	Repair		E	
	Replace		E	
Loose	Adjust		F	
Missing	Install		F	
Overgrown	Trim	X	F	
Strain/Abrasion	Adjust		F	
	Remove		F	
Guy Marker				
Missing	Install		F	
Hardware/Framing				
Bird Prot Required	Install		E	
Broken/Damaged	Repair		E	
	Replace		E	
Loose	Adjust		E	
Missing	Install		E	
High Sign				
Missing	Install		F	
Insulator				
Broken/Damaged	Replace		E	
Flashed	Replace		E	
Primary Squatter	Repair		F	
	Replace		F	
Secondary Squatter	Repair		E	
	Replace		E	
Jumper				
Burnt	Replace		E	
Clearance Impaired	Adjust		E	

FDA		New	Priority	Comp
Lightning Arrester				
Broken/Damaged	Replace		E	
Flashed	Replace		E	
Marking				
Broken/Damaged	Replace		F	
Missing	Install		F	
Molding				
Broken/Damaged	Repair		F	
	Replace		F	
Loose	Adjust		F	
Missing	Install		F	
OH Facility				
Bird Prot Required	Install		E	
Graffiti	Paint		E	
Idle Facilities	De-Energ		E	
	Remove		F	
	Transfer		F	
Limited Access	Inspect		B	
	Patrol		E	
	Remove		E	
Obstructed	Inspect		B	
Pole				
Broken/Damaged	Re-Frame		E	
	Repair		E	
	Replace		E	
	Pole Stub		E	
Burnt	Repair		E	
	Replace		E	
	Pole Stub		E	
Clearance Impaired	Repair		E	
	Replace		E	
Decayed/Rotten	Pole Top Repair		E	
	Repair		E	
	Replace		E	
	Pole Stub		E	
Idle Facilities	Remove		F	
Leaning	Adjust		F	
	Replace		F	
Overloaded	Replace		E	
	Test		E	
No Safe Access to Pole	Inspect		B	
Woodpecker Damage	Assessment		E	
Recloser/Sectionalizer				
Broken/Damaged	Repair		E	
	Replace		E	
Excessive Operation	Overhaul		E	
Flashed	Repair		E	
	Replace		E	
Leaks/Seeps/Weeps	Clean		E	
	Repair		E	
	Replace		E	
Riser/Pothead				
Broken/Damaged	Repair		E	
	Replace		F	
Flashed	Repair		E	
	Replace		F	
RTVI				
Interference	Repair		E	
	Replace		E	

FDA		New	Priority	Comp
SCADA/PDAC				
Broken/Damaged	Repair		F	
	Replace		F	
Leaks/Seeps/Weeps	Repair		F	
	Replace		F	
	Test		B	
Steel Lattice Pole				
Guarding Missing	Install		E	
Pole Step				
Clearance Impaired	Remove		F	
Streetlight				
Broken/Damaged	Repair		E	
	Replace		E	
Missing	Install		E	
Switch				
Broken/Damaged	Repair		E	
	Replace		E	
Trans_Dist Pole				
Bonding Broken	Repair		E	
Tie Wire				
Broken/Damaged	Replace		E	
Loose	Replace		E	
Transformer				
Broken/Damaged	Repair		E	
	Replace		F	
Corroded	Replace		E	
Flashed	Repair		E	
	Replace		E	
Idle Facilities	Remove		F	
Overloaded	Test		E	
Leaks/Seeps/Weeps	Clean		B	
	Repair		F	
	Replace		E	
Tree/Vine				
Clearance Impaired	Remove	X	E	
	Trim		F	
Decayed/Rotten	Install CL Pole		E	
Overgrown	Remove		E	
	Trim		E	
Trip Saver				
Broken/Damaged	Repair		E	
	Replace		E	
Under-Arm Bus				
Broken/Damaged	Repair		F	

EMERGENCY ONLY Check Cause (Required)			
☐	Animal	☐	Bird
☐	Equip Failed	☐	Fire
☐	Lightning	☐	Pole Rotten
☐	Third Party	☐	Tree Branch
☐	Tree Contact	☐	Tree Fell
☐	Unknown	☐	

All FDA's identified in field
Priority = Default Priority for B, E, G, & F-Regulatory FDA's
Comp = Check if completing FDA in Field

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Notification #: 113271607

Nuns 100