CAL FIRE

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION
Sonoma-Lake-Napa Unit
1199 Big Tree Road
St. Helena, CA 94574

INVESTIGATION REPORT

CASE NUMBER:	20CALNU015947
CASE NAME:	Glass
DATE:	September 27, 2020
INCIDENT TYPE:	Wildland Fire
INCIDENT INVESTIGATOR(s):	Gary Uboldi, Fire Captain - LNU Brandon Bertolino, Battalion Chief - CFA Joe Baldwin, Battalion Chief - LNU

1 – VIOLATION(s):

No violations observed.

2 - SUMMARY:

On Sunday September 27, 2020 at approximately 3:50 AM CAL FIRE Saint Helena Emergency Command Center (ECC) dispatched resources to a reported vegetation fire in the Glass Mountain Road area of the City of Saint Helena, CA.

Initially two areas of interest were identified as locations of a possible ignition source for the fire. The two locations were 300 North Fork Crystal Springs Road and 286 North Fork Crystal Springs Road. After further review of wildfire detection cameras data, I excluded the 300 North Fork Crystal Springs Road property as an area of interest. I was unable to exclude the property located at 286 North Fork Crystal Springs Road as a possible location of the origin of the fire.

Based on my training, experience and the facts presented to me I believe the origin of the fire to be located near the address of 286 North Fork Crystal Springs Road. Once the fire ignited it spread to a local substantial fuel source and produced a generous number of embers which ignited the adjacent fuel beds within the canyon. This rapid ignition of surrounding fuels by spot fires contributed to the rapid spread and extreme fire behavior which was compounded by a dry north wind event we were experiencing at the time of the incident.

I was unable to identify the specific origin location or cause for the Glass Fire. I was able to narrow down a likely origin area / area of interest for the fire near the address of 286 North Fork Crystal Springs Road. Based on the situation and condition of the area of interest I could not rule out electrical as a possible cause for the fire.

The resulting fire was named the Glass Fire and burned a total of 67,420 acres between Napa, Sonoma, and Lake Counties. The Glass Fire burned for a total of 23 days and was fully contained on October 20, 2020.

3 - SUSPECT(S)/SUBJECT(S):

No suspects or subjects have been identified in this case.

4 - VICTIM(S), WITNESS(ES) & SUBJECT MATTER EXPERTS:

W-1 Bruce [redacted]

8300 St. Helena Highway

Rutherford, CA. 94573

[redacted]

Co-*Owner of Cakebread Vineyards, primary contact for Cakebread Vineyards.*

W-2 Mike [redacted]

8300 St. Helena Highway

Rutherford, CA. 94573

[redacted]

Property and vineyard representative of Cakebread Vineyards.

W-3 Scott [redacted]

[redacted]

Witness and captured a photograph of the fire on September 27, 2020 from the address of [redacted]

W-4 Mathew O'Sullivan

451 Aviation Blvd # 101

Santa Rosa, CA 95403

(707) 324-2400

Pilot of Reach Air Ambulance Three (REACH 3) witness to the fire on September 27, 2020 while in flight from Saint Helena Hospital.

W-5 Elizabeth [redacted]

[redacted]

Witness to the fire on September 27, 2020 from her residence.

W-6 Mike Cole

[redacted]

Private Fire Investigator, retained by various insurance carriers.

W-7 Dennis [redacted]

8300 St. Helena Highway

Rutherford, CA. 94573

[redacted]

Co-*Owner of Cakebread Vineyards*

SME-9 Toby Terpstra

6070 Greenwood Plaza Blvd., Suite 200

Greenwood Village, CO 80111

(303)733.1888

Principal Forensic Animator from Kineticorp representing Cakebread Vineyards.

Can speak to producing the forensic animation of the Glass Fire.

W-10 Richard Linkert

3638 American River Drive

Sacramento, CA 95864-4711

(916) 978-3434

Attorney, representing Cakebread Vineyards from Matheny Sear Linkert Jamie LLP.

SME-11 Andrew Thoresen
Oracle Forensics
500 N. 56th St., STE 21
Chandler, AZ 85226
(877) 672-2534
Electrical engineer form Oracle Forensics retained by Matheny Sear Linkert Jamie LLP for Cakebread Vineyards.

SME-12 Chris Warren
3030 S. Tejon St.
Englewood, CO. 80110
(303) 762-8487
Senior Fire Investigator for EFI Global who was retained by Matheny Sear Linkert Jamie LLP for Cakebread Vineyards.

SME-13 Kevin Baker
1079 Sunrise Ave, Ste B-172
Roseville, CA 95661
(916) 740-7397
Private Investigator with KMB Investigations who was retained by Matheny Sear Linkert Jamie LLP for Cakebread Vineyards.

SME-14 Chris Lautenberger
Reax Engineering Inc.
1921 University Avenue
Berkeley, CA 94704
(510) 629-4930 Ext. 801
Engineer with Reax Engineering who was retained by Matheny Sear Linkert Jamie LLP for Cakebread Vineyards

W-15 Steve [redacted]

Burgess Cellars

[redacted]

(707) 963-4766

Winemaker / President of Burgess Cellars. Can speak to the photographs taken from Burgess Cellars on the morning of September 27, 2020 during the fire.

5 - EVIDENCE:

See attachment 5.5 for the complete list of evidence collected by CAL FIRE.

6 – CONDITION(S):

WEATHER:

Weather station name: Atlas Peak

Weather station type: Remote automated weather station (RAWS)

Location:

5000 Atlas Peak Road
Napa, CA 94558
Lat. 38° 28.495'N
Lon. 122° 15.890'W
Elev. 2025 FT.

Date & time: September 27, 2020 at 3:00 AM.

Temperature: 72º F
Fuel temperature: 68º F
Fuel moisture: 7.1 %
Relative humidity: 32%
Wind direction: North
Wind speed (avg.) 10. MPH.
Wind speed (max) 21. MPH.

7 – VEHICLE(S)/EQUIPMENT:

No vehicles or equipment other than the items collected as evidence are involved.

8 - PROPERTY:

Location of interest

Owner(s): KODO INC. / DBA Rental Property

Physical address: 286 North Fork Crystal Springs Road

Saint Helena, CA.

Latitude 38º 34.105'N

Longitude -122º 29.793'W

Property size: 70 +/- acres

*See attachment 14.1 thru 14.7 for further detail of the location of interest.

In attachments 14.1 thru 14.7 the location of interest is identified on the overview maps by a red highlighted area.

9 - NARRATIVE:

On Sunday September 27, 2020 at approximately 3:50 AM CAL FIRE Saint Helena Emergency Command Center (ECC) dispatched resources to a reported vegetation fire in the Glass Mountain Road area of the City of Saint Helena, CA. I responded to the incident on duty, in uniform in my department assigned vehicle. During this time the National Weather Service issued a Red Flag warning for high fire danger due to a north wind event in Napa County.

I entered Napa Valley from the west, on Petrified Forest Road, and then south on Highway 29 through the City of Calistoga. While driving I could see the north flank of the fire on the east side of Napa Valley, east of Silverado Trail. The smoke column was spreading west across the valley. When I arrived at CAL FIRE Sonoma – Lake – Napa Headquarters I was unable to see a majority of the fire perimeter due to heavy smoke conditions.

After gathering information on the reported location of the fire I drove south on Highway 29 to the intersection of Deer Park Road and Silverado Trail. From this location I saw the fire perimeter was north of Deer Park Road. I continued driving east up Deer Park Road to the address of 1120 Deer Park Road where I knew I could get a better view of the south perimeter of the fire. When I arrived at the address I saw the south edge of the fire perimeter was north of Bell Canyon Reservoir burning down the north slope to the shore line of Bell Canyon Reservoir.

I left the address of 1120 Deer Park Road and drove to Crystal Springs Road. When I arrived at the intersection of Silverado Trail and Crystal Springs Road I saw the north edge of the fire had spread north past the North fork of Crystal Springs Road. The west edge of the fire perimeter had crossed Silverado Trail in several areas.

I drove east up North Fork Crystal Springs Road. While driving on North Fork Crystal Springs Road I saw advancing type macro fire pattern indicators. This was evident from the angle of char in the trees and brush indicating to me the fire had burned down slope to the south west, into the valley.

I continued driving east to the address of 290 North Fork Crystal Springs Road. While en route to this location, CAL FIRE Battalion Chief Joe BALDWIN sent me an email. The email contained an attachment from the California Military Department (CAL GUARD). The attachment was an electronic document in the form of a heat signature map from September 27, 2020 at 4:16 AM. The heat signature map showed an approximate location of a heat source which was detected at 4:16 AM, southwest of the address of 290 North Fork Crystal Springs Road bellow the residence in the canyon.

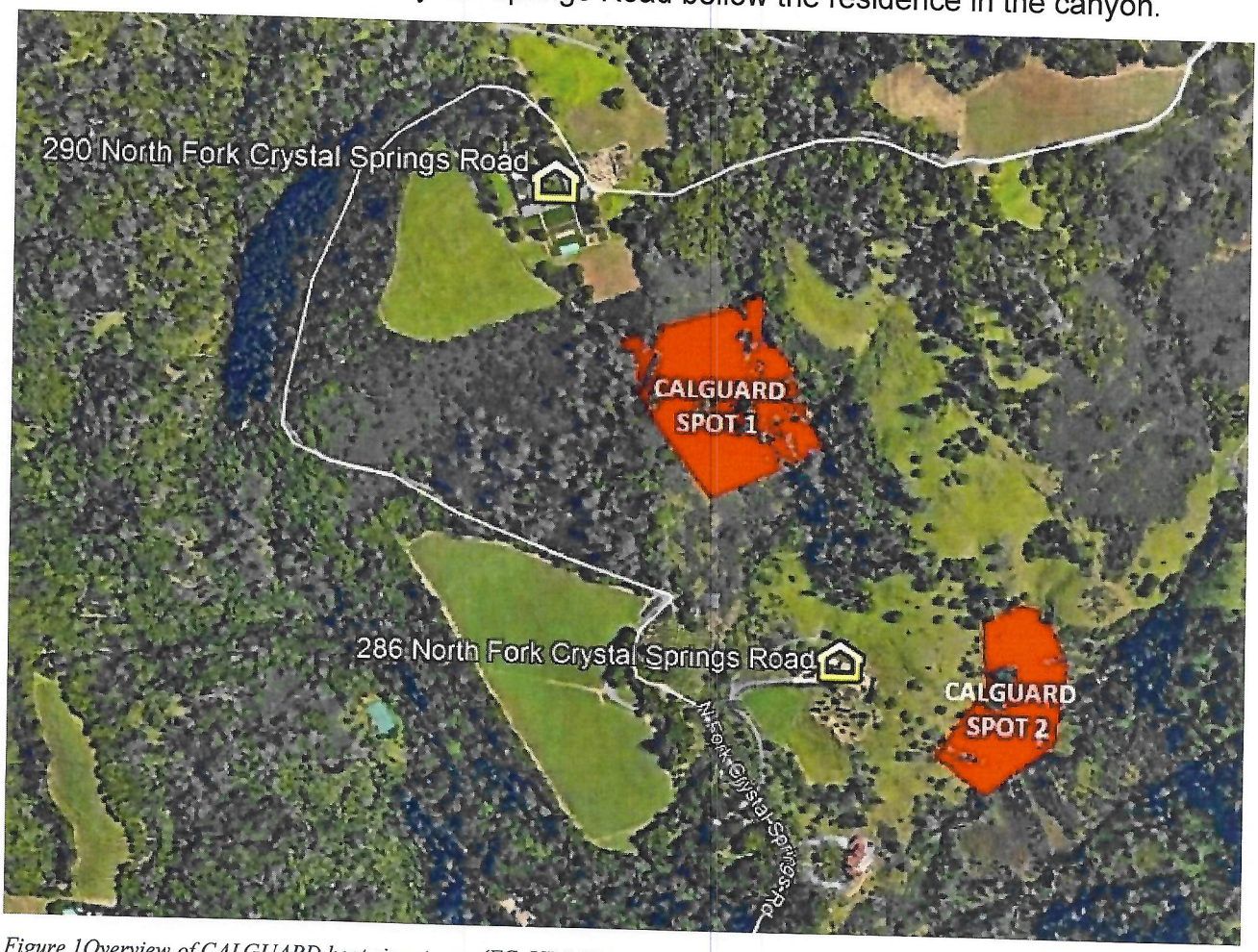

Figure 1Overview of CALGUARD heat signatures. (FC. UBOLDI, G)

When I arrived at the address of 290 North Fork Crystal Springs Road I saw the location of the heat signature encompassed an area which included Pacific Gas & Electric overhead electrical lines on the south side of the main residence. The overhead electrical lines ran southwest to northeast through the property and split off to extended east towards the address of 300 North Fork Crystal Springs Road. From the property of 290 North Fork Crystal Springs Road I saw macro fire pattern indicators in the form of angle of char which was an initial area of interest to me regarding a possible area of origin. This area of interest was in the bottom of a canyon below the section of overhead electrical lines extending between the electrical pole at the address of 290 North Fork Crystal Springs Road and 300 North Fork Crystal Springs Road.

The power pole at 290 North Fork Crystal Springs Road supporting the overhead electrical lines between the two addresses had significant structural damage from the fire. BALDWIN and I began searching the area of the canyon along the electrical power lines. Due to the damage to the power pole we conducted a quick survey of the area of interest to minimize the risk of becoming injured had the damaged power pole failed while looking for fire pattern indicators. We made the decision to request PG&E to come secure the power pole prior to conducting any further search for fire pattern indicators at this location. After we left the canyon BALDWIN left the location and I stayed at the property waiting for PG&E.

Once PG&E arrived at my location they secured the power pole with their crane truck and left the property, leaving the crane truck. Prior to leaving, the PG&E supervisor for the crew told me the electrical lines in question were “hardened”. The supervisor told me that this new type of conductor wire, which is gray in color, is fully insulated and could not create a fault or arc if contacted by a grounded source or other phase of the electrical system. The supervisor told me the electrical lines had been recently upgraded due to their location in a high fire hazard area.

I have seen and witnessed the older type of insulated conductor wire, which is black in color, have insulation type failures in my experience. These failures cause the conductor to arc and fault phase to phase or to ground due to deterioration from environmental exposure and age.

After speaking with the supervisor, I spoke with three separate PG&E linemen working at the location about the upgraded "hardened" lines. All three linemen agreed with the supervisor's statements regarding the "hardened" electrical lines. All the linemen I spoke with expressed their confidence in the new insulated electrical conductor wires safety.

Once the PG&E crews left I returned to the area of interest in the canyon, underneath the overhead powerlines. I saw backing, lateral, and advancing fire pattern indicators around the area of interest. However, the fire pattern indicators I saw were isolated and surrounded by advancing macro fire patterns on the outside perimeter indicating to me the area of interest was a spot fire ignited by an ember from the main fire. I believe this spot fire was ignited by the advancing or lateral flame front and then was fully enveloped by the main fire.

BERTOLINO called me while I was in the canyon, and requested that I come to BALDWIN and his location at the address of 300 North Fork Crystal Springs Road. After evaluating the fire pattern indicators in the canyon and determining the location of interest was more than probable a spot fire I continued to BALDWIN and BERTOLINO's location.

While driving to BALDWIN's and BERTOLINO's location I saw that the location was located at the bottom of a vineyard, accessed by a gravel road. A general topographical description of this location is mid slope on a southwestern aspect of a spur ridge. The location is near the lower southwestern corner of the vineyard located at 300 North Fork Crystal Springs Road.

The area in question is located below wide gravel parking area and two separate shed type structures. Below the two sheds was a vehicle gate across a dirt road which was off the main gravel road. The gate appeared to had been originally designed for an automated gate opener. On both sides of the fence along the dirt road were keypad pedestals for the gate. I saw a concrete pad was built for a gate opener on the exterior side of the perimeter fence north of the dirt road.

Figure 2 Overview diagram image of 300 N. Fork Crystal Springs site. (FC. UBOLDI, G)

Prior to inspecting the buildings and equipment at the location I conducted a preliminary visual search for fire pattern indicators within the surrounding area. During my initial search, I located several lateral and backing fire pattern indicators in the form of sooting, staining, and areas of protection. The area visually appeared to have been exposed to a low intensity fire behavior. From my initial visual survey of the fire pattern indicators located in this area I could not rule out the possibility of the fire originating from this location.

On the interior side of the perimeter fence near the gate was a metal post. Attached to the metal post was a solar panel, electric fence controller, and wooden box with a 12-volt automotive type battery inside. The wooden box was painted black in color and only had three sides with a lid. The 12-volt battery had several electrical wires attached to it.

I saw one of shed structure had several large propane storage tanks near the exterior and a large generator inside. This shed structure was located near the edge of the perimeter fence of the vineyard and below a sediment retention pond.
I saw the shed with the generator had electrical conduit exiting the exterior of the building and extending down the hillside to the perimeter fence line. Where the electrical conduit met the perimeter fence, it turned south and continued to the corner of the fence line. From the corner of the fence line the electrical conduit continued east along the fence line to a vehicle gate.

The electrical conduit was positioned along the lower portion of the vineyard fence for its entire length which was approximately two hundred feet long. I saw the electrical wire that was originally inside the conduit was exposed in several areas due to damage by fire. I saw several areas along the electrical conduit were missing coupling fittings. It appeared to me the person who had performed the installation of the electrical wiring had omitted the couplings during installation.

I saw the electrical conduit terminated near the vehicle gate and concrete pad on the exterior side of the perimeter fence. The termination of the conduit left the electrical wires protruding out the open end of the conduit unprotected. I saw the electrical wires on the concrete pad terminated in to a three-way splice constructed with wire nut type electrical connectors wrapped with electrical tape which was black in color.

The first section of the wire splice continued unprotected on the surface of the ground to a metal post located on the interior of the perimeter fence. The wires extended up the exterior of the metal post, were secured with plastic wire fasteners (zip-ties), then went over the exterior of the wooden box to where an 8.5-amp solar charge controller was

secured.

The wires terminated at the positive and negative terminals on the solar charge controller. I saw two additional wires, one black and one red, exiting the solar charge controller and continue through a hole in the wooden box. Once the two wires entered the wooden box they connected directly to the threaded stud terminals of the 12-volt automotive battery. From the second set of positive and negative terminals located on the 12-volt automotive battery was two clamp type wire connectors.

The wires leading from the clamp type wire connectors extended towards the interior of the wooden box, behind the 12-volt battery and out an exterior hole. After the wire exited the hole in the wooden box they terminated in the rear of the electric fence controller.

The front of the electrical fence controller was green in color with yellow and white pictograms and writing. I saw a LED indicator bar on the upper right portion of the housing. In the middle/front of the controller was a six-position sliding electrical switch. From left to right the positions were

- "Off"
- "Battery test"
- "Slow – Day, Fast - Night"
- "Fast – day, Slow – Night"
- "Half Energy"
- "Full Energy"

I saw the electric fence controller sliding switch was set in the "off" position.
The electrical fence controller had two threaded stud type terminals on the front face of the unit, one green in color, and one red in color. Both threaded stud type terminals had large plastic type threaded nuts which secured two separate wires, one was red in color, and one was green in color.

Figure 3 Close up view of electric fence controller. (FC. UBOLDI, G)

The first wire was connected to the red terminal extended out unsupported, towards the vineyard perimeter fence and terminated at a clamp type electrical connector which was red in color. The red clamp type electrical connector was attached to a crimped electrical connector and continued to the exposed portion of electrical fence which was insulated from the main body of the vineyard fence.

The second wire was connected to the green terminal. It extended out unsupported towards the vineyard perimeter fence and terminated at a clamp type electrical connector and was green in color. The green clamp type electrical connector was attached to a crimped electrical connector and continued to the main body of the vineyard fence.

I saw the perimeter vineyard fence construction consisted a woven metal grid construction extending from the surface of the ground to approximately six feet in height overhead. Above the woven metal grid construction were two strands of barbed wire with a single strand of un-insulated electrical fence wire.

On the exterior portion of the woven metal grid portion of the fence were the insulator assemblies extending horizontally, approximately twelve inches away from the main body of the fence. These insulator assemblies consisted of a ridged wire formed in a "V" shape with the two ends bent at opposing ninety-degree angles. The two opposing ninety-degree angles attached directly to the metal grid portion of the fence. The portion of the insulator assemblies which secured the energized electrical fence wire was constructed of plastic and contained a plastic clip to secure and insulate the energized electrical fence wire.

The second leg of the electrical wire splice was located on the concrete pad and extended down into an electrical conduit that was extending out of the top of the concrete pad. The electrical conduit extended back to the base of the metal post located on the interior of the vineyard fence.

The electrical conduit was connected to the interior of the sub-grade portion of the metal post. From inside the metal post the electrical wire extended up the interior of the metal post to the top where it exited a hole on the side of the metal post. From the exterior hole in the metal post the wire connected directly to the solar panel mounted on top of the metal post.

After evaluating the fence, I waited until my requested security guards arrived to relieve me. Once relieved by the security guards I left the location and drove to the Spring Mountain Road area of Saint Helena to further investigate several spot fires in the Spring Mountain and Saint Helena Road areas.

After scouting the locations of the new fires in the Spring Mountain and Saint Helena Road area I continued to my residence because it was beginning to become threated by a spot fire on Saint Helena Road. I remained committed to fire suppression efforts related to the Saint Helena Road spot fire until 7:00 AM September 29, 2020.

On September 29, 2020, I returned to the property of 300 North Fork Crystal Springs Road to continue my investigation. I resumed my investigation by searching for fire pattern indicators in the surrounding area. I saw evidence of low intensity backing and lateral type fire pattern indicators in the area. I saw the fire pattern indicators increased in intensity and transitioned to advancing type fire pattern indicators as I continued my search pattern outwards from this location.

I identified and marked the fire pattern indicators I located with colored survey pin flags per the National Wildfire Coordination Group (NWCG) guidelines.

- Advancing fire pattern indicators (Red flags)
- Lateral fire pattern indicators (Yellow flags)
- Backing fire pattern indicators (Blue flags)

I began my search for fire pattern indicators north of the sediment pond area on the opposing hill side across the drainage. I saw advancing micro fire pattern indicators in the form of sooting, staining, and angle of char directing me south back in to the drainage. As I continued up the south side of the drainage back toward the generator shed I saw the micro fire pattern indicators transition from advancing to lateral and backing type fire pattern indicators.

After locating the transitional zone between the advancing and lateral fire pattern indicators I followed the contour of the slope to the west along the drainage, this followed the transitional zone back to the top of the ridge to an open area just west of the vehicle gate.

The fire pattern indicators I saw indicated to me that a fire had originated near the fence line with the electric fence. It appeared to me after the fire started it had burned with a low intensity away from the ridgeline down in to the drainage to the opposite slope where it transitioned to an advancing fire.

I made several attempts to further narrow down the location of the fire origin at the property of 300 North Fork Crystal Spring Road. I was unable to locate the fire origin at this location due to the low intensity burn patterns in and around the area of the fence line and boulders. I could not identify overall burn pattern direction due to the vast amount of inconsistent micro fire pattern burn indicators located within that area.

After identifying and marking the fire pattern indicators I found, I began to collect evidence which I believed could be associated with the cause of the fire. I began my evidence collection at the electric fence controller near the vehicle gate. I photographed and marked all the wires prior to disassembly.

Prior to making any cuts in to the wire I inspected the area to be cut for previously made cuts, abrasions, wear marks or arc marks. I made every attempt to cut each electric wire separately. However, the electrical supply wire from the generator shed leading to the electric fence unit was sealed and I was unable to separate the two wires. I decided to cut both the wires at the same time. When I cut both wires I experienced an electrical arc from the wires when I made the cut.

The electrical arc was small and made an audible snap when I cut through the wires. After seeing and hearing the arc I determined the electrical wire to be still energized. After cutting the wires I placed electrical tape over each of the ends to prevent further electrical arcing. It should be noted that the wire which produced the electrical arc when I cut them was part of an open circuit at the time and only supplied by the twelve volt batteries located in the generator shed. After collecting all the evidence, I secured it in my vehicle and transported it to the CAL FIRE Santa Rosa evidence locker.

On October 1, 2020, I met with BALDWIN and BERTOLINO. We conducted a review of fire pattern indicators northwest of the property of 300 North Fork Crystal Springs Road. We parked at the residences of 286 North Fork Crystal Spring Road. The residence of 286 North Fork Crystal Spring Road is located approximately 1,420 feet west and downslope from the location of interest at 300 North Fork Crystal Springs Road. The area remained secure because of the evacuations orders which were still in place from the fire.

We hiked up slope from 286 North Fork Crystal Spring Road towards the location of interest at 300 North Fork Crystal Springs Road. I saw several macro and micro advancing fire pattern indicators spreading north from the location of interest at 300 North Fork Crystal Springs Road along the side contour of the slope. From the fire pattern indicators I saw it appeared the fire advanced from the location of 286 North Fork Crystal Springs Road to my initial location of interest at the property of 300 North Fork Crystal Springs Road.

On Wednesday October 7, 2020, I met with REACH Air Medical Services Mathew O'SULLIVAN, Pilot of Reach Air Ambulance Three (REACH 3). O'SULLIVAN told me the following in summary.

On September 27, 2020 O'SULLIVAN and his flight crew flew from Sutter Clearlake Hospital, located north of the City of Clearlake, CA. to Saint Helena Hospital located near the community of Deer Park, CA O'SULLIVAN told me they were flying with the assistance of Night Vision Goggles (NVG).

While in route to Saint Helena Hospital they flew south down the Napa Valley, just west of North Fork Crystal Springs Road. O'SULLIVAN told me while in route to Saint Helena Hospital he did not see a fire to the east of him on the hill. O'SULLIVAN told me he began to see a glow from the north after they had landed at the Saint Helena Hospital helicopter pad.

Once O'SULLIVAN's crew had returned from the hospital and loaded back up on to the aircraft they departed Saint Helena Hospital heading in a northwestern direction. O'SULLIVAN told me as he gained elevation he saw a vegetation fire north of their location. O'SULLIVAN told me he flew the helicopter north towards the location of the fire on the hillside. O'SULLIVAN told me the fire appeared to be six to eight acres in size, burning mid-slope on the hillside.

O'SULLIVAN told me he was about to report the fire via radio to CALFIRE Saint Helena Emergency Command Center (ECC) when he heard ECC begin to dispatch the fire. O'SULLIVAN told me after he heard ECC dispatching the fire he returned to Napa County Airport where his base is located.

After I interviewed O'SULLIVAN we flew on helicopter REACH 3 back to Saint Helena Hospital to re-trace his flight path from the morning of September 27, 2020. Prior to the flight and leaving Napa County Airport, I told O'SULLIVAN I would not instruct him of the location of the Glass Fire origin. O'SULLIVAN and I agreed we would start retracing his flight path from the Saint Helena Hospital helicopter pad.

O'SULLIVAN and I departed Napa County Airport and flew north to Saint Helena Hospital. O'SULLIVAN approached the Saint Helena Hospital helicopter pad as if he was going to land then continued past the helicopter pad and on to the departure route O'SULLIVAN used on September 27, 2020. We continued northwest over the ridge line and changed direction and began flying north towards the main ridgeline.

I positioned myself in the helicopter on the right-hand side of the aircraft directly behind O'SULLIVAN who was in the pilot's seat. Both O'SULLIVAN and I would have a similar field of view out the right-hand side of the helicopter. While flying O'SULLIVAN was not able to observe or hear me in the back seat taking pictures and video of the flight. I did this to prevent O'SULLIVAN from having any visual or audible cues on the accuracy of his location and memory from the night of the fire.

As O'SULLIVAN and I approached North Fork Crystal Springs Road, O'SULLIVAN directed me to a location on the hillside near the property of 286 North Fork Crystal Springs Road. O'SULLIVAN told me the fire was spreading down slope in a southern direction.

O'SULLIVAN directed me to four distinctive geographic landmarks for reference. The first land mark O'SULLIVAN Identified was Bell Canyon Reservoirs geographic position as it was related to the location of the fire. The second landmark O'SULLIVAN used was the residence at 286 North Fork Crystal Springs Road.

The residence in question has a prominent white chimney on the west side of structure and aided in giving O'SULLIVAN positional reference point as it related to the fire. The third land mark was the dirt road traveling northeast to southwest along the spine of the ridge from the general origin area (GOA). The fourth land mark was the propane tanks between the perimeter fence and shed at the property of 300 North Fork Crystal Springs Road.

After O'SULLIVAN identified the location of the fire and provided me with landmarks for positional reference, I requested we continued to orbit the location to assist with collecting aerial photographs.

On Wednesday October 8, 2020 I met with Electrical Design and Forensic Engineer Gerard MOULIN from the Ohm Corporation at CAL FIRE Santa Rosa Station Evidence Storage Locker. I requested MOULIN to review the evidence items I had collected on September 29, 2020. MOULIN inspected the evidence items for malfunctions and possible sources of ignition.

MOULIN inspected the items and told me the following in summary.

MOULIN was concerned about the condition and construction of the wire connection which supplied the electrical fence controller. However, MOULIN told me he did not believe this was a viable source of ignition due to the lack of thermal damage to the electrical tape wrapping the splice. After he evaluated the overall condition of the evidence items we tested the operation of the electric fence controller.

MOULIN, and I bench tested the electrical fence controller by powering the electric fence controller with the same battery which was collected as evidence. We first tested the battery and established the battery was registering 12.6 volts which was within normal operational range. After testing the battery we connected the battery to the electric fence controller with a set of temporary wires. We tested the conductivity and voltage of the distant connection from the battery to the electric fence controller, which also read 12.6 volts. After confirming the electric fence controller had a sufficient electrical source we attempted to operate the electric fence controller.

We started with the selector switch of the electric fence controller in the off position. We confirmed the absence of electricity being conducted from the positive (red) and negative / ground (green) output terminals of the electric fence controller. We continued the bench test by moving the selector switch in to all six positions. We were unable to operate the electric fence controller in any of the six switch positions. We determined the electric fence controller to be non-operational.

On Monday October 12, 2020, I returned to the address of 300 North Fork Crystal Springs Road and met with the property owner Bruce [redacted] and his associates. I requested to collect additional evidence items. [redacted] agreed and gave me verbal consent to enter and collect additional items on the property. [redacted] requested I allow his private fire investigator Chris WARREN from EFI Global to assist

with collection. I agreed and allowed WARREN to assist with collection. From my observations the property did not appear to had been disturbed or altered. During the collection process I performed all the cutting and marking of the electrical wire and conduit. WARREN worked alongside me in my direct supervision. WARREN took photos of the wire and conduit after each section was marked and cut. I allowed WARREN to gently manipulate the items so he could capture the markings on each section of wire and conduit.

I started this collection process near the vehicle gate and worked back to the generator shed. During this process WARREN followed my direct orders and did not disturb the condition of the evidence. After I had completed the cutting and marking of the evidence items I requested WARREN to assist me with carrying the sections of electrical conduit and wire back to my vehicle. Once all the sections of electrical conduit and wires were back at my vehicle I secured the evidence items in my vehicle and transported them back to CAL FIRE Santa Rosa Station Evidence Storage Locker.

On Tuesday November 10, 2020 MOULIN returned to CAL FIRE Santa Rosa Station to inspect the evidence I recovered from the property of 300 North Fork Crystal Springs Road on Monday October 12, 2020. Prior to MOULIN's arrival I laid out all the electrical wire and conduit on the floor of one of our apparatus bay floors. I laid the wire and conduit out in order by the numeric order I collected them in. When MOULIN arrived, I explained to him several geographical reference points along the electrical wire and conduit as it related to the diagram. After showing him the diagram and reference points he conducted his inspection.

After conducting his inspection MOULIN told me the following.

MOULIN told me he did not see any obvious signs of arcing along the wire and conduit. MOULIN identified two sections of conduit which remained questionable regarding possible arcing. The three sections of conduit in question had sustained heat damage related to the fire and had melted around the enclosed electrical wire.

The melted conduit obstructed our view and ability to remove the wire without altering or destroying the evidence. MOULIN recommended if we wanted to further inspect the remaining three sections of wire and conduit we should have them sent to a laboratory for a non-destructive x-ray inspection.

On November 14, 2020, I visited the site private investigator Mike COLE brought to our attention at 286 North Fork Crystal Springs Road. When I arrived at the location identified by COLE I spoke to COLE by phone. COLE told me the following in summary.

COLE told me he was hired by his client to evaluate the area for possible origins of the Glass Fire. COLE told me while in the area he stopped at the location and took a walk around the water tanks. COLE told me he located several electrical panels behind the wooden fence.

Figure 4 Overview diagram image of 286 N. Fork Crystal Springs Road (FC. UBOLDI, G)

COLE told me based on his experience it appeared a fire had occurred in the interior of the electrical panels and spread to the outside. I asked COLE if he had seen and

followed fire pattern indictors to this location. COLE told me "no" that he just happened to stop and look around this location and by chance and found the electrical panels. I visited COLE's location twice. On my initial visit, I saw that the water tanks were a part of the property located at the address of 286 North Fork Crystal Spring. The property in question consisted of grassy oak woodland with outlying patches of heavy brush around the perimeter of the improved portion of the property. Below the cluster of water tanks and above North Fork Crystal Spring Road was an olive tree orchard. Between the cluster of water tanks and the residence was a single set of PG&E powerlines.

I saw that the area consisted of three concrete water tanks which were approximately ten thousand gallons each. Between two of the tanks were the remains of what appeared to be a plastic water tank against the hillside. The plumbing connecting the tanks which ran underground had been recently exposed post fire for repair work. On the western side of the cluster of water tanks were several valves and three electrical panels which appeared to had been mounted to a wooden frame.

The wooden frame securing the electrical panels had been destroyed by fire. Around the outside of the valves and electrical panels was a wooded fence. The wooden fence sustained minimal damage compared to the surrounding vegetation. The fire damage sustained to the fence was limited to a partially burned section located near the ground orientated directly behind the electrical panels.

The second area of fire damage to the fence was on the northeast end of the fence. This area the fence ran from the bottom of the fence to the top and had fully consumed several fence boards and a structural fence post. The plumbing connecting the valves to the tanks consisted of polyvinyl chloride (PVC) and iron pipe of assorted diameters.

Adjacent to the cluster of water tanks, uphill to the east I saw two rows of elevated electrical solar panels. Between the two rows of solar panels I saw a bank of electrical boxes with large lever type switches.

Between the location of the cluster of water tanks and the residence to the south on the property I saw several PVC pipes installed on the surface of the ground between the two locations. The PVC pipes installed on the surface of the ground appeared to be used for carrying water to the residence and irrigation. The electrical panels which COLE identified at the location of the cluster of water tanks appeared to have been electrical switch and breaker boxes.

On December 21, 2020, I participated in a video conference call with [redacted] and his associates. The following individuals attended the video conference.

- Bruce [redacted] (Co-Owner of Cakebread Cellars)
- Dennis [redacted] (Co-Owner of Cakebread Cellars)
- Mike [redacted] (President / CEO of Cakebread Cellars)
- Toby TERPSTRA (Principal Forensic Animator from Kineticorp)
- Richard LINKERT (Attorney, Matheny Sear Linkert Jamie LLP)
- Andrew THORESEN (Engineer, Oracle Forensics)
- Chris Warren (Sr. Fire Investigator, EFI Global)
- Kevin Baker (Private Investigator with KMB Investigations)
- Chris Lautenberger (PhD with Reax Engineering)

During this video conference representatives from [redacted] presented to me photographic and video evidence which I had not seen before. I had no knowledge of additional wildfire surveillance cameras prior to the video conference with [redacted]. Previously I had only been aware of the Alert Wildfire Cameras operated by the University of Nevada in the area. This data was a part of a photogrammetry and 3D computer visualization model created by Toby TERPSTRA from Kineticorp.

The photographic and video evidence items in question were sourced from a IQ Firewatch camera system. Prior to the Glass Fire the IQ Firewatch camera system had been installed in two locations in the upper Napa Valley. One camera was located on a ridgeline above the Clover Flat Landfill and the other was located near the top of Diamond Mountain Road. The IQ Firewatch camera system is a separate third party entity to Matheny Sear Linkert Jamie LLP or Cakebread Vineyards.

The video and pictures I saw during the presentation showed the general area of the initial start of the fire being located on upper portion of North Fork Crystal Springs Road near the address of 286 North Fork Crystal Springs Road. From the video and pictures, I saw I could rule out my prior identified location of interest for the origin of the fire at 300 North Fork Crystal Springs Road which is owned by Cakebread vineyards.

After the Cakebread meeting I inquired with TERPSTRA if additional photos which they did not possess would assist him with improving the accuracy of the photogrammetry and 3D computer visualization model of the fire. TERPSTRA told me yes. With [redacted]'s approval TERPSTRA agreed to meet with me and collect the additional data to improve the accuracy of the photogrammetry and 3D Computer Visualization model of the fire.

On January 29, 2021, I met with TERPSTRA at the address of 3750 Silverado Trail Calistoga, CA. I provided TERPSTRA with a copy of the original photo which was taken of the Glass Fire at 3:52 AM on September 27, 2020. I showed TERPSTRA the approximate location on the property where the photo was taken of the glass fire looking east at Nork Fork Crystal Springs Road. After I provided TERPSTRA with the info he set up his equipment and collected his data.

On February 24, 2021 TERPSTRA sent me the updated photogrammetry and 3D computer visualization model of the fire. After reviewing the data I saw additional evidence which confirmed my hypothesis that the fire originated near the address of

286 North Fork Crystal Springs Road.

From the photogrammetry and 3D computer visualization model of the fire I could see the earliest data collected was from 3:37 AM on September 27, 2020. At this point in time I estimate the size of the fire to be a minimum ten to fifteen acres in size. The foot print of the fire at 3:37 AM encompasses the area of interest located at 286 North Fork Crystal Springs Road.

On March 11, 2021 I spoke with Fire Investigator Mike COLE over the phone. COLE told me he had retained an electrical engineer to evaluate the electrical equipment at the property of 286 North Fork Crystal Springs Road. COLE told me he had obtained permission from the property manager to further evaluate the electrical equipment. COLE told me he and his electrical engineer were unable to locate any possible ignition sources from the assorted electrical equipment or solar panels located on the property.

Spot fires on the night of September 27, 2020

During the evening of September 27, 2020 several new fires started on the southern side of the Napa Valley between the City of Saint Helena and Calistoga Road in Sonoma County. During the night of September 27, 2020 I drove out to the new fires located along the Napa and Sonoma County line. All the fires I saw were in difficult to access, un-developed, rural areas. I saw heavy smoke conditions over the area which was limiting my visibility along with large ash and ember particles falling from the sky from the main smoke column produced by the Glass Fire.

After I left the area I had CAL FIRE, Captain Specialist William LAIRD and CAL FIRE, Captain Specialist Joel GOLDMAN continue the investigation the following day on the new fires located along the Napa and Sonoma County line.

Speaking with LAIRD afterwards, I believe the new fires were spot fires from the original Glass Fire. The extreme fire behavior conditions on the original Glass Fire had created a strong convection column over the fire prior to the new spot fires occurring.

The convection column located on the northern side of the Napa Valley picked up and deposited burning embers in to receptive fuel beds in the area near the Napa and Sonoma County line. In my experience this is a common occurrence and I have witnessed this type of event several times in my career, particularly in Sonoma and Napa Counties.

Based on the facts, evidence, and statements presented to me I believe the new fires which started on September 27, 2020, located along the Napa and Sonoma County line originated from spot fires, produced from burning embers by the original Glass Fire.

Opinion and conclusion:

Based on my training, experience, and evidence presented to me, I believe on the morning of Sunday September 27, 2020 a fire ignited in the upper portion of North Fork Crystal Springs Road. I am unable to determine the exact location of the origin or cause of the Glass Fire.

I believe the origin of the Glass Fire to be in the canyon between the addresses of 286 North Fork Crystal Springs Road and 290 North Fork Crystal Springs Road. Due to the rapid development of the initial fire and corresponding spot fires which occurred post ignition of the fire I was unable to locate consistent fire pattern spread indicators directing me back to the location of the original ignition source. Once the fire ignited it spread to a local significant fuel source and produced a substantial number of embers. This rapid ignition of surrounding fuels by spot fires contributed to the rapid spread and extreme fire behavior which was compounded by a dry north wind event we were experiencing at the time of the incident.

The Alert Wildfire Camera located on Atlas Peak did capture the initial event of the fire. However, the location of interest is in line with the camera view. I can determine the approximate direction from the Atlas Peak camera but I am unable to determine distance of the glow from the camera view.

Photos collected from the IQ Fire Watch cameras located atop of the Clover Flat landfill and Diamond Mountain Road identified a possible ignition at approximately 3:39 AM and 3:37AM on September 27, 2020 in the approximate area between the addresses of 286 North Fork Crystal Springs Road and 290 North Fork Crystal Springs Road.

I was able to rule out the PG&E owned electrical equipment located in the adjacent area as the cause of the ignition. During the approximate time of the ignition of the fire no reported outages or faults were recorded or reported by Pacific Gas & Electric Company (PG&E) for the area or surround area of North Fork Crystal Springs Road. Additionally, residences in the area reported no events with abnormalities with their electrical services. Electricity services in the area remained on until they were shut down by PG&E during the fire later in the morning of September 27, 2020.
During my investigation I did several visual inspections of the PG&E equipment in the area. I did not see any physical evidence or damage from the PG&E equipment which would have led me to believe they were responsible for the cause of the fire.

I cannot rule out privately owned electrical equipment located in the area as a possible source. Once the location of interest had been identified between the addresses of 286 North Fork Crystal Springs Road and 290 North Fork Crystal Springs Road. I was able to rule out the electrical equipment located at the property of 300 North Crystal Springs Road. I initially collected the equipment as evidence as the cause of the fire. I found work had been performed post fire at the address of 286 North Fork Crystal Springs Road which disturbed the scene substantially, along with wet weather conditions which effectively destroyed any remaining items of evidentiary value.

The Glass Incident burned a total of 67,420 acres between Napa, Sonoma, and Lake Counties. No fatalities or injuries have been reported. Between Napa and Sonoma counties the Glass Fire has destroyed or damaged the following.

- Destroyed 650 residential structures
- Damaged 161 residential structures
- Destroyed 370 commercial structures and out buildings
- Damaged 40 commercial structures and out buildings
- Destroyed 8 infrastructure facilities
- Damaged 5 infrastructure facilities
- Destroyed 505 minor structures
- Damaged 74 minor structures
- Threatened 13,324 residential and commercial structures.

*As of October 8, 2020 per CAL FIRE Incident Command Team 3.

I reserve the right to reexamine my theory and conclusion to the cause of this fire pending the discovery of additional information, evidence, and statements which were not available to me at the time of writing this report. The discovery of additional information, evidence, and statements could amend or reinforce my opinions and cause conclusions of this report.

7/14/2021

Gary Uboldi #2814
Fire Captain Specialist
CAL FIRE
Sonoma – Lake – Napa Unit

10 - ATTACHMENTS:

Attachment 1 (CAL FIRE LE71 BALDWIN, J)

Attachment 2 (CAL FIRE LE71 BERTOLINO, B.)

Attachment 3. (CAL FIRE CAD Dispatch Report FC34)

Attachment 4. (CHP. CAD Dispatch Log Reports)

Attachment 5.1 (300 North Fork Crystal Springs Road Photos)

Attachment 5.2 (CAL FIRE Site maps 300 North Fork Crystal Springs Road)

Attachment 5.3 (Electric Fence Manual)

Attachment 5.4 (CAL FIRE LE-92 Property Report Form - Cakebread)

Attachment 5.5 (CAL FIRE LE-75e Form Evidence Log)

Attachment 6.1 (CAL GUARD Spot Report #1)

Attachment 6.2 (CAL GUARD Spot Report #2)

Attachment 6.3 (Atlas Peak Remote Weather Station Data)

Attachment 7. (Burgess Cellar Photos)

Attachment 8.1 (391 Crystal Springs Road Video IMG_7132)

Attachment 8.2 (391 Crystal Springs Road Video IMG_7134)

Attachment 8.3 (391 Crystal Springs Road Video IMG_7135)

Attachment 9.1 (Alert Wild Fire Camera Photos)

Attachment 9.2 (Alert Wild Fire Camera St. Helena Cam)

Attachment 10.1 (REACH 3 Helicopter Photos #1)

Attachment 10.2 (REACH 3 Helicopter Photos #2)

Attachment 11. (3750 Silverado Trail Photos)

Attachment 12. (286 North Fork Crystal Springs Road photos)

Attachment 13.1 (KINETIC CORP photogrammetry-and-site-diagram)

Attachment 13.2 (KINETIC CORP preliminary-visualization Video)

Attachment 14.1 (Overview map #1)

Attachment 14.2 (Overview map #1 with CAL GUARD overlay)

Attachment 14.3 (Overview map #2)

Attachment 14.4 (Overview map #2 with CAL GUARD overlay)

Attachment 14.5 (Overview map #3)

Attachment 14.6 (Overview map #3 with CAL GUARD overlay)

Attachment 14.7 (Overview map #4)

Attachment 14.8 (Overview map #4 with only outline of perimeter)

Attachment 15.1 (CAL FIRE PIO Map from 09-27-20)

Attachment 15.2 (CAL FIRE PIO Map from 10-01-20)

Attachment 15.3 (CAL FIRE PIO Map Final)

Attachment 15.4 (Overview map of smoke column & ember cast)

Attachment 16 (Site Security Log)