



## Preliminary Ignition Investigation Report

Ignition Database Index:	20240559
Electric Incident Investigation (EII) Number:	N/A
Incident Name:	Little
PG&E Facility Ignition?	Yes
CPUC Reportable Ignition?	Yes
Date & Time of Incident:	June 1, 2024 @approximately 1932 hours
Street Address:	East side of Little Morro Creek Road, approximately 715 feet north of Main Street
City:	Morro Bay
County:	San Luis Obispo
Latitude/Longitude:	35.376281, -120.850962
State Responsibility Area (SRA) / Local Responsibility Area (LRA) / Federal Responsibility Area (FRA)	Local Responsibility Area
PG&E Division:	Los Padres
High Fire Threat District (HFTD):	Tier 2
High Fire Risk Area (HFRA):	Yes
EPSS Buffer:	No
Fire Index Area (FIA):	508
Fire Potential Index (FPI) Rating: FIA	R1
Fire Potential Index (FPI) Rating: Circuit	R1
Was there a PSPS event at the time of ignition?	No
Suspected Initiating Event:	Utility Work/Operation
Failure Driver:	Utility Work/Operation
Failure Sub-driver:	Improper Construction
Circuit:	Morro Bay 1101
Circuit Protection Zone:	LRV66
Nominal Voltage:	12kV
Pole SAP Equipment ID:	101929764
Subject to PRC 4292 Veg Pole Clearance:	No
PG&E Equipment associated with ignition:	Chance Clamp
EPSS enabled at time of ignition?	No
Fault Type:	Three Phase Fault
Wire Down (Primary)?	No
Lead Agency/Agency Having Jurisdiction:	Morro Bay Fire Department
Fire Size:	20' x 40'

<b>FAS Field Remarks<sup>1</sup>:</b>	CREW TO REPLACE JUMPERS ON LINE AND BUCK POLE 715 ALUM TO #6 CU. CHANCE CLAMP WAS ARCHING AND STARTED SMALL VEG FIRE AT BASE OF POLE. ALSO FOUND LEANING POLE THAT NEEDS TO BE STRAIGHTENED. WE MADE TEMP REPAIR ON JUMPER AND THE LINE TESTED GOOD. WE MADE 2 TAGS FOR CREW.
<b>HAWC Summary<sup>2</sup>:</b>	Units responded to an incident at 1847 ATASCADERO RD, MORRO BAY. Fire is being reported as forward progress stopped with a current size of .25 acre. OMT showing 2 outages (OIS# 2472837, 2472836) on the Morro Bay 1101 , 183011101 with 333 customers impacted, Non EPSS enabled. Clamp was arching and started a small vegetation fire at base of pole. Notifications have been made to: PSS HAWC Ops
<b>Injuries / Fatalities / Property Damage / Media Attention:</b>	No/No/No/No
<b>Weather Conditions<sup>3</sup>:</b>	At 1940 hours near the Incident Location: Temperature: 54.6°F Relative Humidity: 88% Wind Speed: 4.1 MPH from the north-northwest Wind Gust: 7.4 MPH
<b>Red Flag Warning (RFW) / High Wind Warning (HWW):</b>	No/No
<b>911 Standby Relief Time:</b>	N/A
<b>OIS #:</b>	2472837 2472836 (cancelled)
<b>ILIS #:</b>	24-0072237
<b>FAS #:</b>	T006407927
<b>TOTL #:</b>	N/A
<b>Assigned Attorney:</b>	N/A
<b>Ignition Investigator &amp; Phone:</b>	

<sup>1</sup> FAS Field remarks are entered verbatim as they appear on the FAS record.

<sup>2</sup> HAWC summary entered verbatim.

<sup>3</sup> Weather Observation Site: 400PG (Elevation 20 feet approximately 281 feet west of the Incident Location): Mesowest.

## Executive Summary

On June 1, 2024, at approximately 1941 hours, PG&E dispatched two troubleshooters to a segment of the overhead (OH) three-phase primary Morro Bay 1101 12kV distribution circuit in response to an outage impacting 333 customers caused by a three-phase fault. The troubleshooters patrolled the circuit and were unable to locate the cause of the fault, however, they did locate equipment arcing on SAP Pole ID 101929764 (“Incident Location” – “Pole #1”)(See Figure 2), (located approximately ¼ mile from the Morro Bay Substation) and CAL FIRE personnel onsite performing suppression activities near the base of the pole.

The troubleshooter (Troubleshooter #1) observed evidence of arcing from a chance clamp on one of three phases connected to Pole #1. The arcing had ignited the light, grassy fuels at the base of Pole #1, leaving a burn scar approximately 20-feet x 40-feet in size. The nearest protective device (located two spans to the west of the Incident Location), Line Recloser V66 (LRV66) had operated, de-energizing the location. The troubleshooters worked off FAS Tag (#T006407927) to make temporary repairs on the chance clamp in an effort to restore impacted customers.

Troubleshooter #1 wrote EC priority ‘A’ Tag (#128966121) to replace the chance clamp with an ampac connector (See Figure 6). That tag was completed by a PG&E crew the following day, June 2, 2024, with the help of troubleshooter #1.

The failed chance clamp was collected and sent to Applied Technology Services (ATS) to be further analyzed. Visual inspection of the tap guard shows significant melting and loss of material at the conductor-clamp interface. There were signs of arc markings between the clamp and all-aluminum conductor (AAC) strands (patina looks new)(See Figures 7-8). There was evidence of previous arcing damage near the top of the chance clamp (bolt area) that appeared to be weathered and old (See Figure 9). The chance clamp and encased conductor shows substantial corrosion products and salt deposits (See Figure 7) that likely contaminated the electrical interface and caused the internal arcing. Prior to the failure, there was an outage reported due to an unknown three-phase fault downstream of the Incident Location. This fault could have likely accelerated the thermal damage to the corroded connector. It is noteworthy that the failed equipment was located in a ‘severe’ corrosion environment.

The incident was reviewed by an Asset Failure Analysis (AFA) engineer, who concluded an improperly installed arcing tap clamp/connector (poor workmanship) caused the ignition. There was evidence of lack of conductor preparation (not enough inhibitor), it was installed in a severe corrosion zone, and was located where the load exceeded four times greater than the limit (~20Amps) it was designed for. It was noted that tap clamps are not to be used in severe corrosion areas<sup>4</sup>.

The incident was reviewed by a Work Standards & Work Methods subject matter expert, who verified that poor workmanship was performed at the Incident Location, leading to the failure. Although the hot tap clamp was found to be an exempt connection, the conditions in which it was installed were incorrect (exceeding the load capacity it was designed for, installed in a severe corrosion zone, and lack of evidence that the conductor was prepared properly with inhibitor).

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<sup>4</sup> Utility Bulletin: TD-028852-B002 – Revision 15, Note #6.

A Safety Condition Assessment Review<sup>5</sup> (SCAR) assessment of the location was conducted on July 15, 2024. As of publication of this report, there were no EC tags created as a result of the SCAR, however, the photos are still being reviewed by the Centralized Inspection Review Team (CIRT).

It was a cool day on June 1, 2024, near the Incident Location. The high temperature for the day was 58.1°F at 1530 hours and the low temperature was 50.7°F at 0610 hours. The relative humidity was as high as 98% at 0450 hours and was as low as 79% at 1520 hours. The strongest wind gust was 16.1 miles per hour (MPH) at 1700 hours from the north-northwest.

## System Protection Analysis

The Incident Location on the Morro Bay 1101 12kV distribution circuit is protected by LRV66 and was not enabled with Enhanced Powerline Safety Settings (EPSS) at the time of the ignition due to the FPI<sup>6</sup> R1<sup>7</sup> (Fire Potential Index Rating 1) conditions observed that day. LRV66 initially detected a Line-Line fault (Phase B and C) that changed to a three-phase fault. Following a time out response, the LRV66 fully opened with a clearing time of 1.029s. LRV66 reclosed 25s later before operating again on a Line-Line (Phase A and B) time out response once again, with a clearing time of 0.379s. The protective device operated as intended.

## Ignition Impact

The ignition was isolated to the vegetation, resulting in a burn scar approximately 30-feet by 30-feet in size. There were no reports of injuries, fatalities, or property damage. There were 333 customers impacted by the outage for a total of 67,932 combined customer minutes.

## Sequence of Events

June 1, 2024

- 1932 Hours – LRV66 opens, First No Light (FNL) (333 customers impacted)
- 1935 hours – First IRWIN time
- 1941 hours – Troubleshooter #1 dispatched, begins patrol
- 1945 hours – Troubleshooter #2 dispatched, begins patrol
- 2256 Hours – Temporary repairs completed, LRV66 closed, all customers re-energized (333 customers restored)

## Corrective Notification Associated with Ignition

The troubleshooter wrote EC Priority 'A' Tag (#128966121) to replace burnt jumper connections (715 to 6 Cu) and to install an ampac (See Figure 6) connection. The tag was completed the following day, June 2, 2024, by a PG&E crew. The troubleshooter also created a second EC Priority 'A' Tag (#128966101) for a leaning pole on the

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<sup>5</sup> SCARs are conducted by System Inspections for equipment related ignitions to identify any similar adverse conditions in the adjacent five spans from each direction of the Incident Location. Poles & equipment requiring assessment are identified by AFA and are addressed through the maintenance tag process.

<sup>6</sup> Utility Fire Potential Index Rating (FPIR): A rating to determine the risk of fire and its likely behavior. Its calculation and scale from 'R1' to 'R5-Plus' considers fuel moisture, humidity, wind speed, air temperature, and historical fire occurrence.

<sup>7</sup> R1 - Very little or no fire danger.



Morro Bay 1101 circuit approximately a ½ mile away that was also completed on June 2, 2024, by the PG&E crew.

## Pending Work

Type	Number	Description	Priority	Date Identified	Due Date
EC Notification	N/A	N/A			
COE Notification	N/A	N/A			
LC Notification	N/A	N/A			
Veg Work Order	N/A	N/A			

Please note this may not include pending major program or project work at the incident location.

## Asset Info & Most Recent Inspections and Tests

Incident Structure		
Info / Inspection	Most Recent Date	Findings
Install Date:	1984	Baxter, Western (Ponderosa) Pine, 45' tall, Methane Propane treated.
Inspection <sup>8</sup> :	May 3, 2022	Non-exempt equipment notated during inspection → Hot tap clamp or split bolt connector. <i>Further investigation found that the hot tap is exempt<sup>9</sup> piece of equipment, however, it still should not have been installed in this location due to being a severe corrosion area.</i>
Patrol:	N/A	N/A
Corrective History:	N/A	N/A
Aerial Inspection Records:	May 11, 2019	Sharper Shape <sup>10</sup> images in shared folder. iHawk <sup>11</sup> Drone Mission – Post-ignition flight on July 15, 2024 ( <i>No action items as of publication of report</i> ).
VM Inspection:	N/A	N/A
EVM Inspection:	N/A	N/A
Equipment Test:	N/A	N/A
Pole Intrusive Test:	August 13, 2008	Pass, 100% strength ( <i>16 years since last PTT test</i> ).
WSIP Inspection:	April 24, 2019	There were no compelling abnormal conditions for the pole, equipment, and its associated spans.

\*Incident Location: SAP Pole ID: 101929764

<sup>8</sup> General Order 165 – The CPUC establishes requirements for electric distribution and transmission facilities (excluding those facilities contained in a substation) regarding inspections in order to ensure safe and high-quality electrical service.

<sup>9</sup> California Power Line Prevention Field Guide: Exempt Equipment Photos (page 58)

<sup>10</sup> Sharper Shape is a 3<sup>rd</sup> party company - Cloud base, Software as a Service (SaaS) maintenance and inspection platform – Living Digital Twin (LDT) allows transmission & distribution utilities to better manage their inspection data.

<sup>11</sup> Cyberhawk (iHawk) is a 3<sup>rd</sup> party company that combines engineering expertise, world-class drone operations, and purpose-built software to deliver end-to-end solutions to support infrastructure asset management programs.

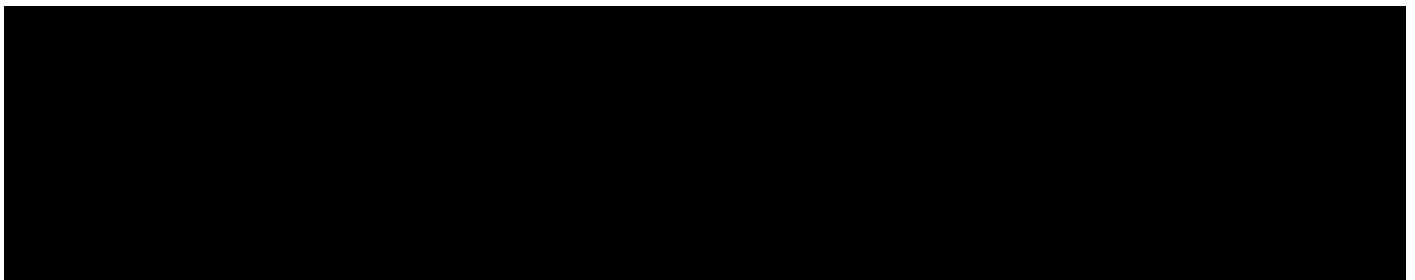
### Hazard Barrier Analysis:

Hazard	Equipment Failure	Sub-Hazard	Connector Failure (Primary Distribution)
Target	Improper installation of connectors in high corrosion area leading to ignition.		
Barrier	Expected vs. Observed Performance	Why did the barrier not prevent the ignition event? (See <a href="#">ICF Codes</a> )	Opportunity
Barriers that Negatively Affected Ignition			
Distribution Detailed Inspection	Expected Performance: Thorough examination of individual components, structures, and equipment through visual inspection and routine diagnostic test. For connectors, identify burnt, corroded, incorrectly installed, equipment or deteriorated insulation.; Observed Performance: Barrier did not perform as expected	A3B1C1D2 - Non-Conformance: Damage identified; no EC tag created	The equipment was notated in the 2022 GO165 inspection however there was no EC tag written for the issue.
Proper Construction & Installation	Expected Performance: Manufacturing and installation guidelines for connectors.; Observed Performance: Barrier did not perform as expected	A2B1C1D1 - Equipment improperly installed	The chance clamp connector should not have been installed at this location due to the large load. There should have been a tag to install the correct connector if the chance clamp was installed during an emergency.
Barriers Evaluated as Opportunities			
Pole Clearing Program	Expected Performance: Limit fire spread potential near poles for a PG&E equipment involved ignition event within State Responsibility Areas, poles with non-exempt equipment, and selected poles outside of the regulations of PRC 4292. Clear 10-ft radius around subject poles from 0-8 feet above ground level.; Observed Performance: Barrier did not exist	[ A4B2C3D2 - Strategy: Program Strategies; Pole-Clearing-Related; Only applies to State Responsibility Areas ]	If the pole had been cleared, there is a high probability this ignition would have lacked fuel to ignite.

### Potential Next Steps / Associated CAP Items:

- The AFA team is taking the lead on next steps/corrective actions.
  - A tailboard covering hot clamps and proper installation that will be delivered regionally, with support of the superintendent.
  - R3+ Risk Team will conduct analysis of open tags in the Los Padres division for improperly installed hot clamps/chance clamps.
  - A potential CAP to track tailboard delivery and open EC tags.

### Single Line Diagram



#### LEGEND



Substation



Fuse

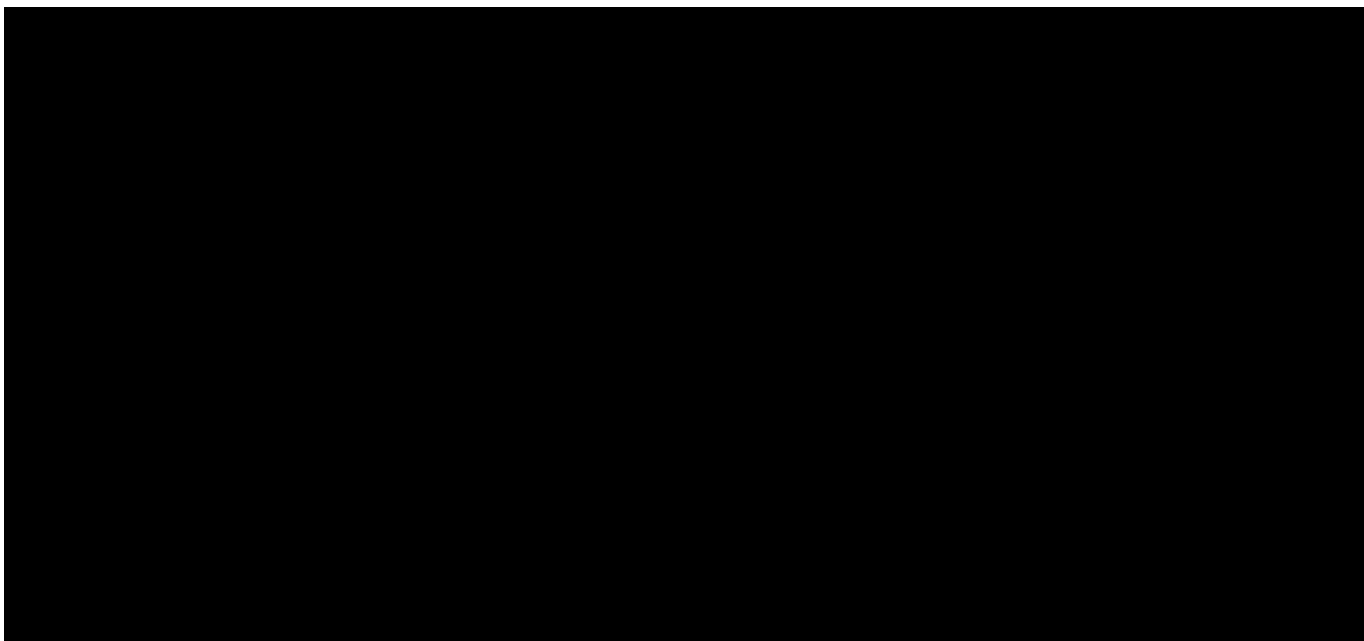


Line  
Recloser



Area of  
Interest

### Photos and Diagrams of Events



*Figure 1 Google Earth Pro map of Incident Location.*



*Figure 2 Burn scar at base of SAP Pole ID 101929764 (Pole #1). Photo taken by troubleshooter on June 1, 2024.*

This report is preliminary and based on available information as of **June 5, 2024**; event data is subject to change based upon subsequently discovered information.

Doc. R18 – Mar 2024

Internal



*Figure 3 Pole #1 – Arcing chance clamp on far-right phase, circled. Photo taken by troubleshooter on June 1, 2024.*





*Figure 4 Chance clamp that was removed, side one. Photo taken by troubleshooter on June 2, 2024.*



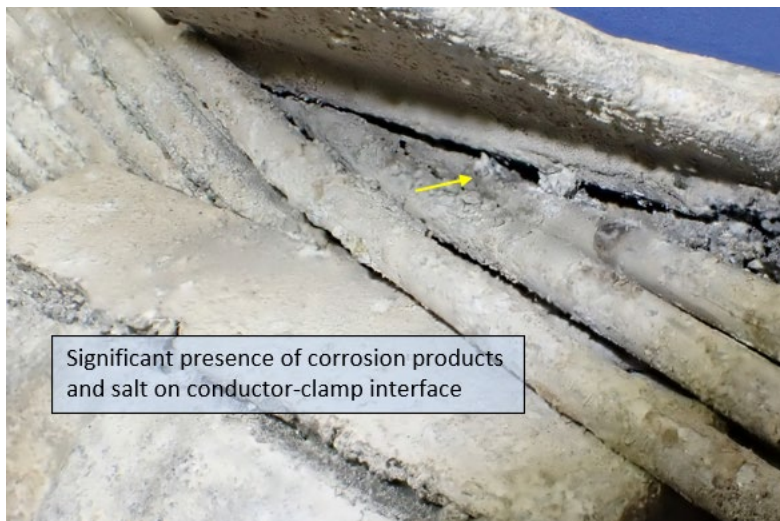


*Figure 5 Chance clamp that was removed, side two. Photo taken by troubleshooter on June 2, 2024.*

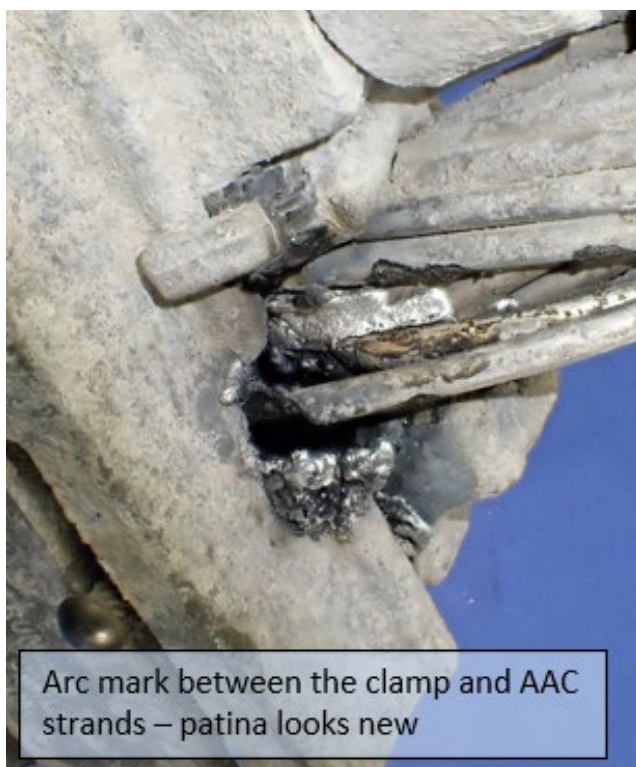


*Figure 6 Ampac connector that was installed by the crew the following day, June 2, 2024. Photo taken by troubleshooter on June 2, 2024.*

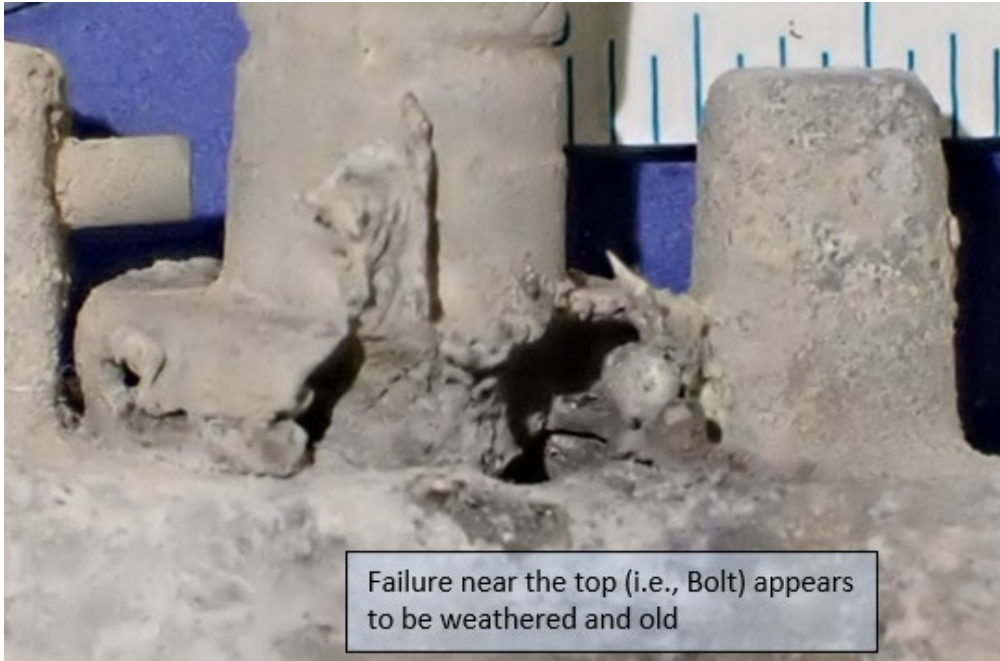




*Figure 7 Significant presence of corrosion products and salt on conductor - clamp interface. Photo taken at ATS by analyzing engineer.*



*Figure 8 Arc mark between the clamp and AAC strands - patina looks new. Photo taken at ATS by analyzing engineer.*



*Figure 9 Failure near the top (i.e. bolt) appears to be weathered and old. Photo taken at ATS by analyzing engineer.*





*Figure 10 Post-ignition/post-construction photos of Pole #1. Drone photo taken by Ignition Investigator on July 9, 2024.*

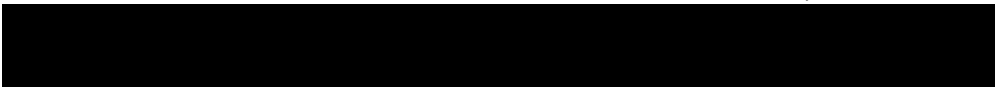




*Figure 11 Post-ignition/post-construction photo of Pole #1. Drone photo taken by Ignition Investigator on July 9, 2024.*

## Attachments

Attachments and references can be located in the ESA folder, located below:



-----END of REPORT-----