CITY OF
PALO ALTO
UTILITIES

WILDFIRE MITIGATION PLAN
2024 UPDATE

Adopted by the Utilities Advisory Commission on June 3, 2024

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I. UTILITY OVERVIEW AND CONTEXT

A. Context table

City of Palo Alto	
Size in Square Miles	26 square miles
Assets	Distribution
Number of Customers Served	29,849 residential and business customer accounts
Customer Classes	Residential and Small/Medium Business
Location/Topography	Urban
Percent Territory in CPUC High Fire Threat Districts	Tier 3 - 0% Tier 2 - 40%
CAL FIRE FRAP Map Fire Threat Zones	40% High *Approx. based on visual interpretation of* CPUC ArcGIS map.[1]
Existing Grid Hardening Measures	Undergrounding
Impacted by another utility's PSPS?	Yes, as a transmission dependent utility, Palo Alto could be impacted by a PG&E PSPS.
Mitigates impact of another utility's PSPS?	Yes
Expects to initiate its own PSPS?	Factors used to identify possible need for PSPS are based on weather forecast and field conditions. Refer to the PSPS Policy and Process.
Prevailing wind directions & speeds by	Please refer to Cal Fire's *Santa Clara Unit 2023 Strategic Fire Plan* for information about wind regional wind conditions. [2]

B. Statutory cross-reference table

Code section	Requirement	Page
8387(b)(2)(A)	Accounting of responsibilities	5
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[1] CPUC ArcGIS map @ https://www.arcgis.com/home/webmap/viewer.html.
[2] CAL Fire's Santa Clara Unit 2023 Strategic Fire Plan @ https://cdnverify.osfm.fire.ca.gov/media/aw4hpsgj/2023-santa-clara-unit-fire-plan.pdf.

C. Process for WMP adoption

Palo Alto is unique among POUs because it has a Utilities Advisory Commission (UAC), an advisory Commission to the City Council. This commission is comprised of Council-appointed residents who meet monthly to provide advice to City Council and staff on utilities-related matters, including the City's Wildfire Mitigation Plan (Plan). A Brown Act body, the UAC publishes agendas in advance of each public meeting and provides opportunities for public comment at each meeting. Each year, Palo Alto staff presents the Plan at a UAC meeting where staff accept any public comments and receive feedback from Commissioners.[3] Minutes and videos of past meetings are available on the City's website.

D. Plan location on the website

Palo Alto's Plan is the first substantive item found on the Utilities Department safety webpage. Navigating to this page from the Department's main page takes only two clicks and is intuitive. Users click on "Utilities Services and Safety," then "Wildfire Mitigation." [4] Because the City also has a Fire Department and an Office of Emergency Services that respond to fires and other emergencies, this report briefly notes how this wildfire Plan differs from other City emergency response plans.

II. PLAN PURPOSE AND OBJECTIVES

A. Purpose

This Plan is written in compliance with Public Utilities Code section 8387 and describes how the City of Palo Alto's Utilities Department (CPAU) maintains and operates its electrical lines and equipment in a manner that minimizes the risk of wildfire posed by those lines and equipment.

B. Scope

The scope of this Plan is limited to providing information about mitigating the risk of wildfires from electric lines and equipment. It distinguishes between mitigating risks of possible electric line-ignited wildfires versus wildfires or wildfire suppression generally. The latter topics are in the scope and under the purview of trained fire experts, such as the city's Fire Department, and not within the expertise of utility engineers and technicians. The former is within the scope of CPAU responsibilities and is the subject of the state code section mandating this Plan; therefore, it is the *sole focus* of this Plan.

[3] PUC 8783(b)(3) requires a POU to "present its wildfire mitigation plan in an appropriately noticed public meeting…[and] accept comments on its wildfire mitigation plan from the public…." While not the governing board of the utility, the UAC review satisfies the legal requirement of presenting the Plan at a noticed public meeting where comments from the public are accepted.

[4] Utilities Department safety webpage @ https://www.cityofpaloalto.org/Departments/Utilities/Utilities-Services-Safety/Safety/Utilities-Wildfire-Safety.

Additionally, this Plan applies to the only area in the City of Palo Alto identified as a high fire threat area in the California Public Utilities Commission (CPUC) State Fire Map. As of 2023, the high fire threat area in Palo Alto includes all areas with the City limits west of Highway 280, referred to as the Foothills Area. (See below, Figure 1). This area is about eight square miles, is sparsely populated, and consists primarily of open space.

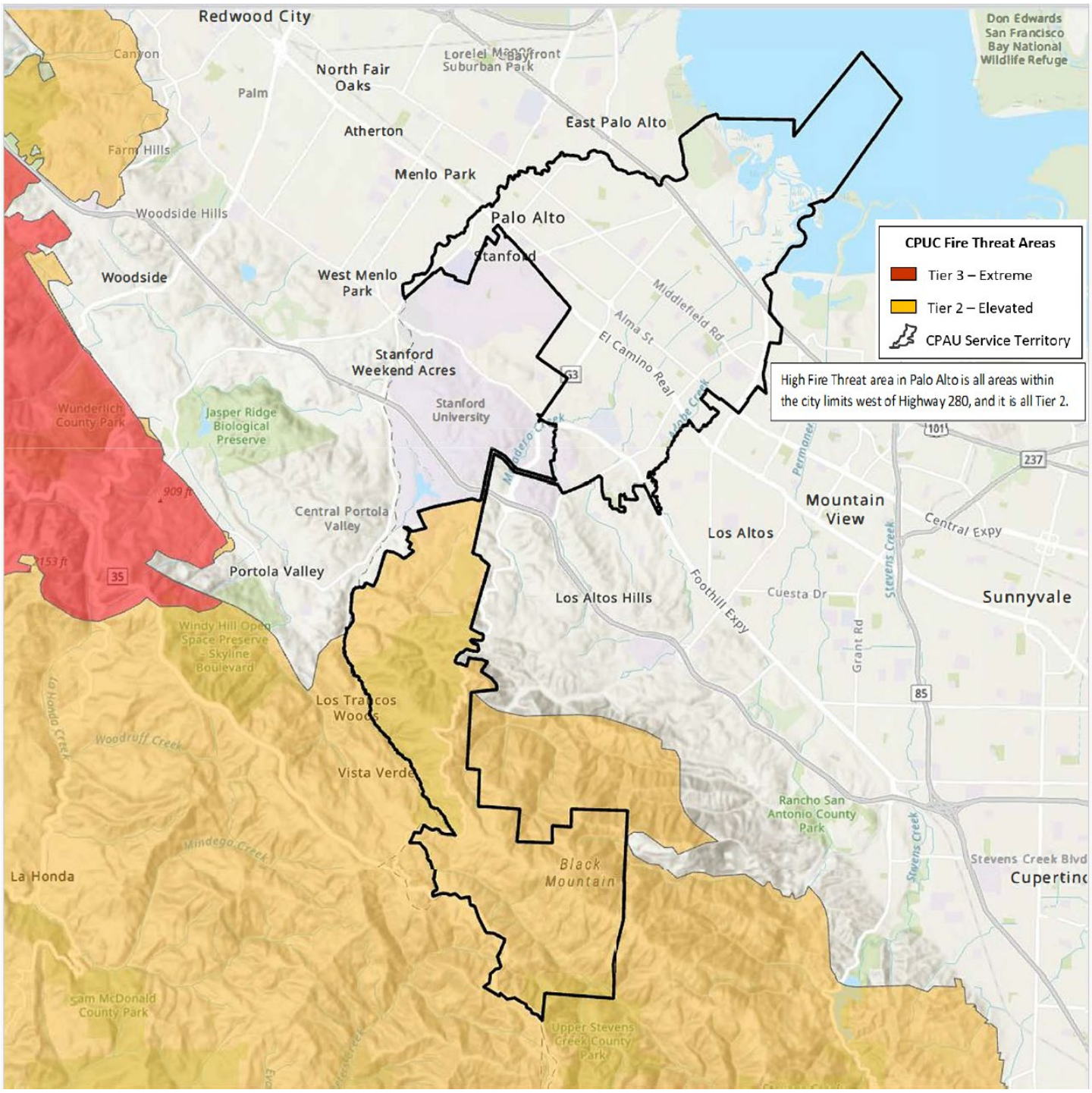
Lastly and per the Board's request of all POUs, this updated Plan deliberately omits general information the Board already understands in favor of specific information about the City's territory, infrastructure, and mitigation projects. For example, the Board already knows that CPAU, and other POUs, meet all applicable GO 95 standards so it is not reiterated here. To avoid redundancy, the Plan omits appendices submitted in prior years, although there may be references to information from prior Plans. This is intended to acknowledge that both CPAU and the Board have limited resources to write and review Plans, the Board has already reviewed the appendices and offered guidance, and recycling past information is not as helpful as providing new information.

C. Plan objectives

The Plan's primary objective is to guide CPAU staff in minimizing the probability that the City's distribution system may be an original or contributing source for wildfire ignition. The City strives to ensure that its infrastructure is safe and resilient by taking proactive actions to maintain its equipment, refine the existing Public Safety Power Shutoff (PSPS) protocols as needed, and underground the electric lines in the only high fire threat area.

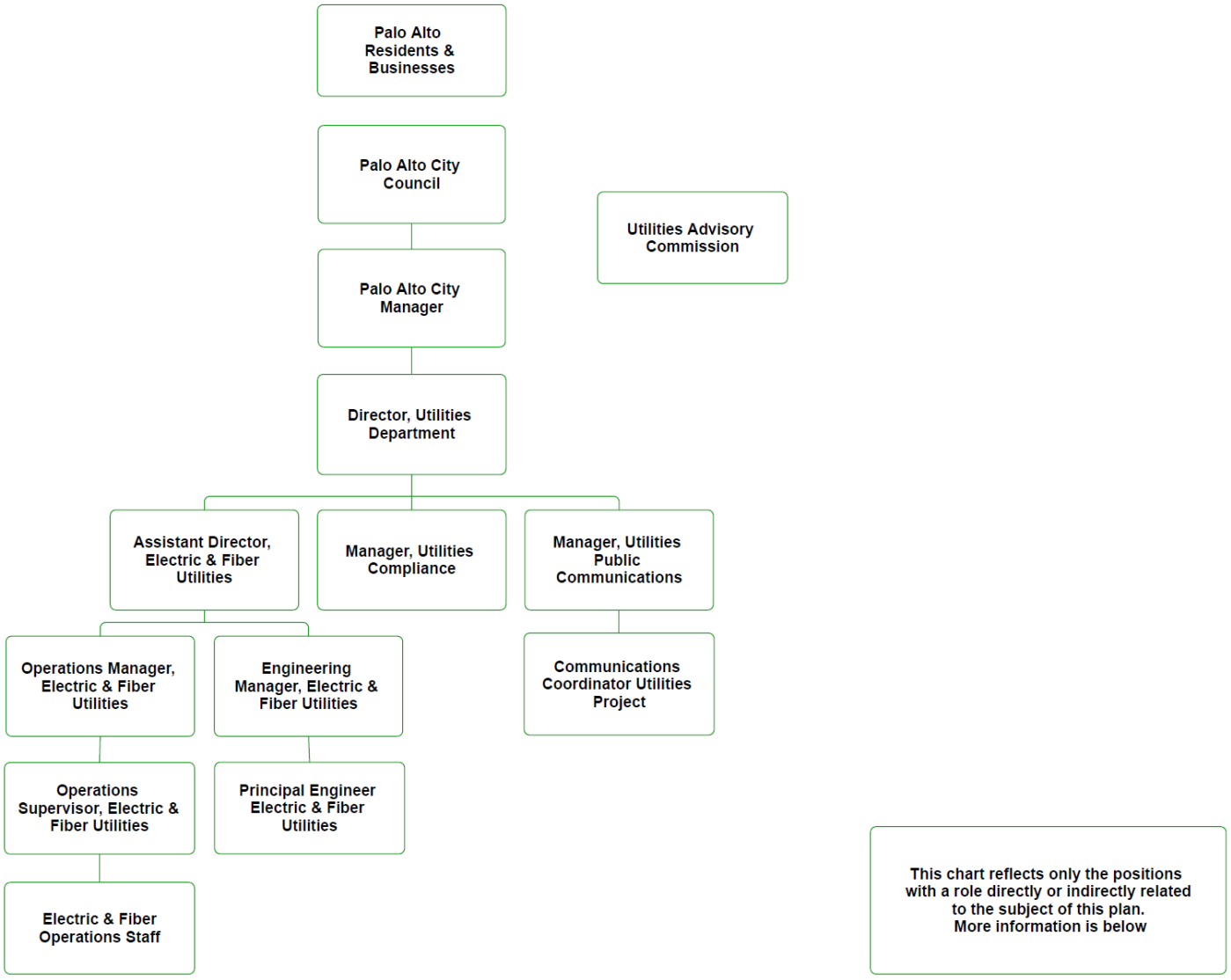
A secondary objective is to improve the resiliency of the City's distribution system and to measure the efficacy of the mitigation strategies.

Fig. 1: CPAU electric service area, showing high fire threat “Foothills Area”.



III. ROLES AND RESPONSIBILITIES

A. City of Palo Alto Utilities Department



In Palo Alto, the City Council is the governing body of all City functions including the City's utilities. As noted above, the UAC is a Brown Act body that provides advice on utilities-related matters. CPAU operates and maintains all the utilities in the City, including electric, water, gas, fiber, and wastewater. CPAU also employs communications staff to engage with the community and a Compliance Manager who, among other duties, ensures reports such as this Plan are completed timely and appropriately.

CPAU's electric and fiber staff noted above all play a role in mitigating wildfire risk from electric lines and equipment. Specifically, CPAU engineers produce safe and resilient designs, and oversee wildfire mitigation projects such as undergrounding electric lines.

Electric Operations staff inspect, repair, and maintain equipment while flagging any potential causes for concern. The CPAU Communications team produces safety communication material to the community, and the Compliance Manager ensures CPAU meets or exceeds laws and regulations.[5]

B. Coordination with other departments

As one division of the City's utilities department, CPAU's Electric Utility staff works closely with other utilities divisions and other City departments. These include the Public Works Department and its Urban Forestry and Environmental Services Divisions, the Fire Department, the Office of Emergency Services, and the water utility Engineering and Operations team. Together, these departments and divisions proactively prepare for wildfires, act to mitigate climate and fire-related risks, maintain electric and water infrastructure, develop plans for deenergization events, ensure appropriate vegetation management, and lead Palo Alto's robust climate action efforts. As these divisions, departments, and teams are under the umbrella of one City, there is a strong history of working together closely.

C. Deenergization-related communication

CPAU's Communications staff is responsible for engaging the community about deenergization events. In doing so, and in deciding whether to deenergize lines, CPAU utilizes the "Utilities Wildfire Mitigation Response and Communications Procedure for Public Safety Power Shutoff."[6] This procedure includes proactively sending a specific recorded message to customers living in the Foothills area, and a more general but still targeted message to all electric customers. These messages are sent prior to deenergizing lines, to allow residents time to act, if necessary.

Palo Alto also sends emails to Foothills residents, with specific information about conditions that may prompt deenergization, the anticipated dates and times of a shutoff, how to prepare, and where to find more information. During a deenergization event, CPAU continues to email and call customers.

The calls and emails prior to and during any shutoffs are supplemented with frequent information posted on CPAU's website and social media accounts.

[5] To keep the public informed of CPAU's capital improvement projects (CIPs), CPAU places CIP-related information on its website. This information includes primary staff contact information for the projects.

[6] This document was previously provided to the Board as Attachment G in Palo Alto's 2022 Plan. As a newer procedure that remains accurate, it has not been updated since that submittal.

IV. ELECTRIC-LINE IGNITED WILDFIRE RISK DRIVERS WITH PREVENTION AND MITIGATION EFFORTS

A. Primary risk drivers and specific mitigation efforts

Palo Alto recognizes that the Board is most interested in specific risks unique to each POU and its service territory, rather than general risks carried by all electric utilities. As such, and because Palo Alto is in the process of undergrounding the lines in its single high fire threat area, this Plan notes only the risk associated with electric equipment in the Foothills area. The more general risks Palo Alto regularly mitigates, but does not specifically address in this Plan, include:

- Electric system operating, management, and construction practices outside the Foothills area
- Weather including high winds outside the Foothills area
- Extended drought

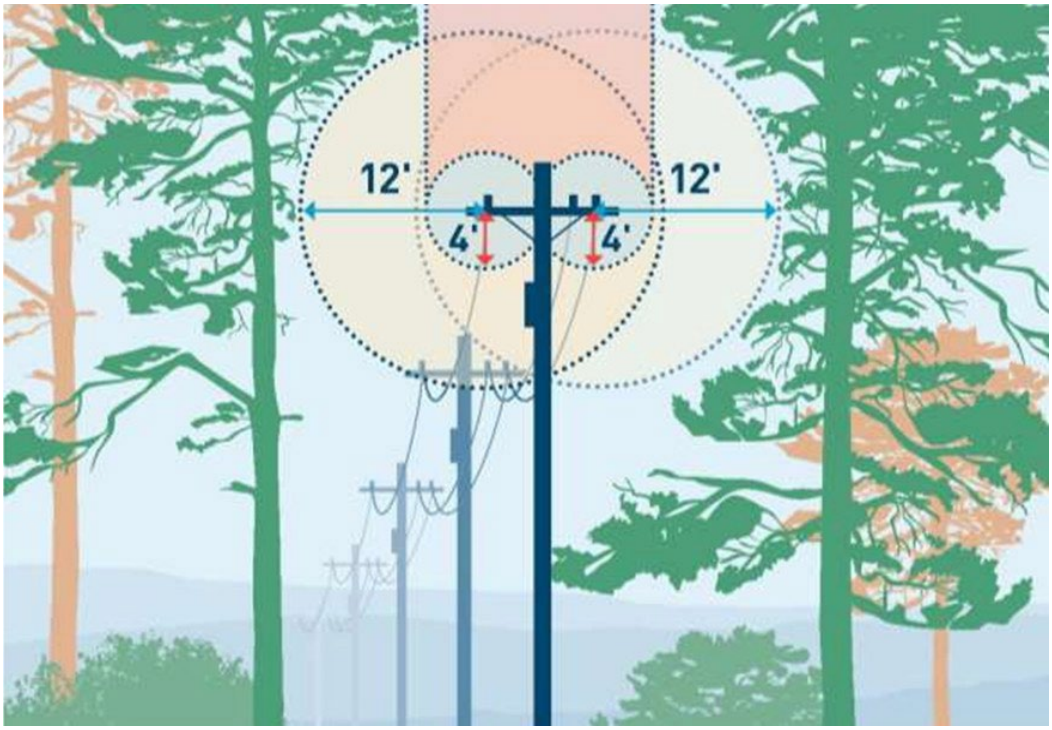
With regard to weather monitoring, Palo Alto installed a weather station in the Foothills area, allowing staff direct, localized weather data. CPAU staff also monitor regional conditions, receive red flag warnings, and communicate with first-responder departments on any actions needed due to weather conditions.

B. Primary risk drivers and specific mitigation efforts: Vegetation type, density, and management practices.

Wildfire risks from electric lines and equipment include vegetation intruding into power lines, falling onto lines, or roots damaging undergrounded equipment. Mitigation efforts include ongoing physical inspections, ensuring the proper type of vegetation is placed at the correct distance from equipment, and adherence to the City's Line Clearing Program and Tree Technical Manual for proper care of trees. Palo Alto is fortunate to have a dedicated Urban Forestry Division within the Public Works Department, staffed by trained and experienced urban foresters. Twice a year, these individuals evaluate every line-adjacent tree in the high fire threat area with a potential for contact with CPAU electric lines.

Palo Alto utilizes a variety of vegetation treatment methods to reduce the risk of wildfire, including tree or branch removal, trimming, mowing, brush cutting, discing, and herbicide use. The Urban Forestry Department is planning a program to help remove potential fall-ins from trees outside of Palo Alto's maintenance envelope of line-adjacent trees. In the future, to help staff track and manage flammable new growth, Palo Alto may utilize GIS and growth modeling. Currently, this work is performed manually with physical inspections.

In addition, for the Foothills area, Urban Forestry uses an enhanced vegetation management buffer as shown in the diagram below:



This practice exceeds GO 95 minimum clearance standards for the line voltage. Specifically, a 4-foot radial clearance is the minimum required in high fire danger areas for lines between 750 volts and 300kv; Palo Alto maintains a minimum of 10 feet and a target of 12 feet radial clearance for all circuits in the Foothills area.

C. Other electric equipment-specific mitigation strategies

- *Disabling certain reclosures*. In the Foothills area, CPAU has two reclosers on the distribution line that automatically open when they sense a large amount of current flowing due to a fault. After a preset delay, they both can automatically reclose; however, as a method to minimize fire risk, the reclosing function is permanently disabled on both reclosures and at the circuit breaker of the substation serving this area. Restoring service requires manual reclosing, which occurs only after staff have physically inspected the lines, performed any needed repairs, and ensured that the outage cause is removed. While this practice means potentially longer outage times, it is an important risk mitigation activity.
- *Utilizing specific fuses*. CPAU utilizes non-expulsion fuses in the high fire threat area. Specifically, CPAU utilizes Eaton's Cooper PowerE series ELFE fuse, a full range, current-limiting dropout fuse with a self-contained design that eliminates noise and expulsive showers. If these fuses explode, any hot metal is contained within the fuse holder, preventing contact with vegetation.
- *Deenergizing, then reenergizing when prudent*. CPAU considers deenergizing electric lines as a last resort, realizing that while the lack of power could be an

inconvenience for some customers, it could cause significant health and safety concerns for others. However, CPAU will utilize this option when necessary to minimize the risk of an electric-line ignited wildfire in the high fire threat area. Factors CPAU considers when determining whether to deenergize include:
    - The possible safety impacts to City customers
    - Any fire activity in the vicinity
    - Any evacuation orders and other information from emergency personnel
    - Information from local fire agencies, vegetation staff, and CPAU electric operators
    - Local and regional weather conditions including wind, humidity, precipitation and any red flag warnings
    - The state of vegetation in the area (i.e. very dry)
- *Restoring power after a wildfire or deenergization event.* Lines will only be reenergized when (1) the risk has passed, (2) the lines are inspected, and (3) any needed repairs are complete. CPAU utilizes a Public Safety Power Shutoff (PSPS) policy and procedure when determining whether to deenergize lines because of a wildfire risk. The written protocol also includes customer notification procedures and reenergization information.[7] In addition to customer notification from the Utilities Department, PSPS communication is also coordinated with Palo Alto's Office of Emergency Services. The decision to institute a PSPS also includes working with CPAU's water utility staff to determine if the City should pump water up to the reservoirs located in the Foothills area in advance of shutting off power, to ensure there is sufficient water and water pressure for any firefighting activities.
- *Coordination with PG&E.* As a transmission-dependent utility, CPAU communicates with PG&E regarding their potential deenergization events that may impact the City's service territory.
- *Studying device coordination strategies*. Staff has engaged in protective device coordination studies to ensure that any fault is isolated quickly and any impact limited. Based on these studies, CPAU changed the fuse type and size, as noted above, on Foothills area distribution lines and changed relay settings for reclosers and a station circuit breaker.

D. Enterprise-wide Safety Risks

Palo Alto's protocol for identifying and addressing enterprise-wide safety risks is a collaborative effort with various City departments. Together the goal is to prevent, protect from, mitigate, respond to, and recover from a broad range of potential hazards and threats. The City's Office of Emergency Services (OES) leads that coordination with the goal of developing, maintaining, and sustaining a citywide, comprehensive, all hazard, risk-based emergency management program that engages the whole

[7] The PSPS Policy and Process was included as Appendix F in the City's 2022 update and has not been updated since then. Information on PSPS events can also be found on the website here.

community. The City maintains and updates the following reports and plans that provide information regarding the risks in Palo Alto and the necessary actions to take.

- *Threat and Hazard Identification and Risk Assessment Report*[8] - The result of the THIRA process is an organized evaluation of vulnerability and implementation measures based on the necessary capabilities to deal with the natural and non-natural hazards and threats of most concern.
- *Local Hazard Mitigation Plan*[9] - Identifies and prioritizes potential and existing hazards across jurisdictional borders, including hazards that may be further amplified by climate change, and provides mitigation objectives with prioritized actions.
- *Foothills Fire Management Plan*[10] - Addresses a broad range of integrated activities and produced planning documents to address and mitigate the impacts of fire hazards in the Palo Alto Foothills Area.

E. Current and prior activities

CPAU's earlier Plans note mitigation tasks the City has already completed, such as preparing a Foothills Fire Mitigation Plan and acting as "territory lead" for the CPUC's fire threat map. Additionally, prior Plans note ongoing efforts, which continue. These include regular vegetation management, inspection and maintenance of the electric system, and electric infrastructure designs that consider fire safety. Attachment A shows the status of CPAU's mitigation-related activities.

V. MONITORING THE PLAN

A. Measuring Plan and inspection performance

In preparing annual Plans, CPAU takes the opportunity to evaluate the current Plan for any deficiencies, or if any best practices have changed. In doing so, CPAU considers what, if anything, related to wildfires occurred in the high fire threat area. Any events related to wildfires or City electric infrastructure in the Foothills area could inform future Plans and help understand the effectiveness of the current Plan. Since CPAU began submitting these annual reports, there have been no wildfires in the high fire threat area.

With regard to inspections, CPAU examines its electric equipment in the high fire threat area more frequently than in other areas of the service territory. Staff strive to ensure that all inspections are completed by June, before the historic start of fire season, or earlier, depending on drought conditions. Inspections are completed manually. Staff analyzes the results of the inspections for trends of any failures or maintenance needs,

[8] The Threat and Hazard Identification and Risk Assessment Report can be found here.
[9] The Local Hazard Mitigation Plan can be found here.
[10] The Foothills Fire Management Plan can be found here.

which can inform future design changes. Staff also monitors the performance of equipment during windy and raining weather as described in the metrics below.

B. Performance and outcome metrics

CPAU audits the effectiveness of the Plan's mitigation and prevention efforts by using two broad metrics: performance and outcomes. Information specific to each are below:

i. Performance metrics

a. Vegetation management. This metric includes the amount of vegetation cleared or number of trees trimmed in the high fire threat area.

b. Infrastructure maintenance in high fire threat area. This metric includes the amount of equipment and number of lines inspected and repaired (if needed) in the high fire threat area.

c. Project status. This metric involves monitoring the progress of any projects related to mitigating wildfires from electric equipment or lines in the high fire threat area and ensuring that projects progress on the proper timeline.

ii. Outcome metrics

a. Electric-line ignited wildfire. This metric includes any fire started by CPAU's electric equipment in the high fire threat area that traveled greater than one linear meter from the ignition point. In at least the past 20 years, there have been zero such fires.

b. Downed lines in the high fire threat area. For purposes of this Plan, a wires-down event includes any instance where an electric line in the high fire threat area of the service territory falls to the ground or onto a foreign object. CPAU will not normalize this metric by excluding unusual events, such as severe storms. Instead, staff will supplement this metric with a qualitative description of any such unusual events.

C. Applying previous Plan metrics to this Plan

CPAU's initial Plan specified two metrics for evaluating performance, each discussed below, and noting how they have informed this revised Plan:

i. Outages to the overhead lines in the high fire threat area

In the 2020 Plan, staff described how CPAU would evaluate any outages in the high fire threat area. (Page 21). It also noted a related project in Appendix F,

rebuilding the overhead lines, the status of which is presented below in Appendix A. CPAU's evaluation of any outages in the high fire threat area described in 2020 remains: Determine if CPAU's activities (a) should have prevented any outages, (b) were adequate to prevent an outage, (c) could be improved, and (d) could not have prevented an outage. Both the evaluation and metric remain for this Plan because they properly inform CPAU efforts in preventing outages.
Since January 1, 2020, CPAU has had 10 outages in the Foothills area. None were a result of a PSPS event or weather-related. Most were caused by animal activity in this heavily wooded area or a car hitting a pole.

ii. Fire ignitions

An important metric, CPAU stated in the 2020 Plan that staff would provide the number of fires occurring in the high fire threat area that were less than 10 acres in size, specifically describing any fires larger than 10 acres. Since January 1, 2020, CPAU has had zero wildfires in the high fire threat area over 10 acres with no calls to 911 to report of a fire of any size.

If CPAU experiences any wildfires in this area, whether ignited by electric infrastructure or not, CPAU will work with the Fire Department, Office of Emergency Services, and any related local government agency to review the cause, how or if CPAU equipment related to the cause or was impacted, and collaborate on any after-action activities.

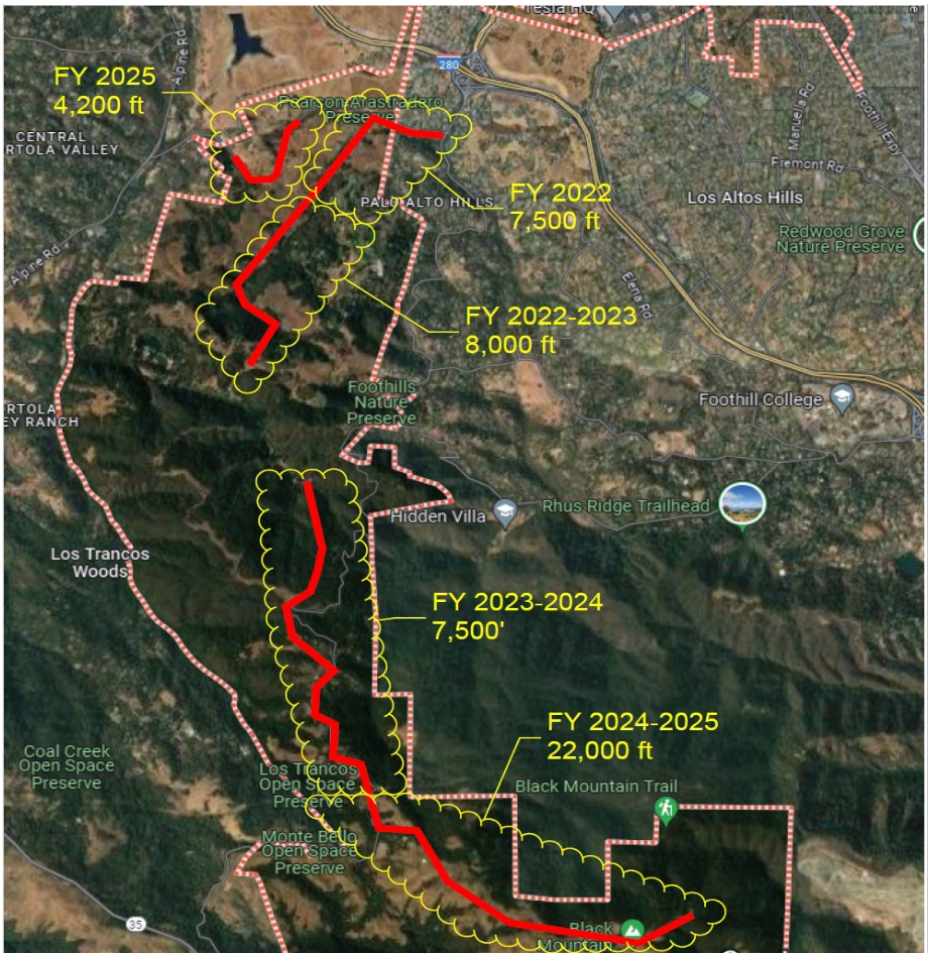
iii. Wires down

This metric includes instances of any electric lines or conductors that fall to the ground or come into contact with a foreign object in the high fire threat area. For each wires-down event, CPAU will utilize an evaluation system similar to CPAU's outage evaluation: reviewing the cause, what actions may have prevented the event, and if there are areas for improvement.

APPENDIX A: WILDFIRE MITIGATION ACTIVITIES

The City's key mitigation activity is undergrounding eleven miles of overhead electric lines in the Foothills area. This project involves installing substructure work, including boxes for electric and fiber lines; removing electric lines and fiber lines from overhead poles; and installing pad-mount equipment where possible.

This iterative project consists of multiple phases (Phases 1-4) and is expected to be complete in 2025. CPAU already installed three of four required substructures.



This image is a high-level visual representation of the project area, timeline, and how many feet below the surface equipment will be placed.

WILDFIRE MITIGATION ACTIVITIES			
Activity	**Description**	**Status**	**Projected completion date**
Undergrounding Phase 1 and Phase 2	Substructure work, installing boxes and padmount equipment, pulling cable, energizing electric lines, and removing electric facilities off of overhead poles.	Substructure work for Phases 1 and 2 in Foothills Park is done. Electric lines are now underground, and facilities are energized.	Completed 2024
Utilizing Fiberglass	Some poles will remain in the high fire threat area once lines are underground. CPAU will use new fiberglass crossarms when replacement is needed to enhance resiliency.	Staff completed the fiberglass crossarms design, ordered materials, but faced shipping delays. Materials arrived in Spring 2023.	Completed 2023
Outage Management System (OMS)	Updating the Outage Management System to provide enhanced customer communication during outages and improve customer service.	Implementation upgrades now offer enhanced functionalities, enabling customer notifications and resource mobilization for outages and emergencies, with updates via email, text, and social media.	Completed 2023
Overhead Pole Removal and Fiber Transfer	Full removal of aerial facilities in Phases 1 and 2 by the end of the Summer.	Fiber cable is still aerial due to long lead times for material, however that material has been received and staff anticipate the full removal of aerial facilities in Phases 1 and 2 by then end of the Summer 2024.	Fall 2024

Activity	Description	Status	Projected completion date
Undergrounding Phase 3	Substructure work, installing boxes and padmount equipment, pulling cable, energizing electric lines, and removing electric facilities off of overhead poles.	Substructure for Phase 3 has been completed on Pony Tracks Fire Road and Page Mill Road.	Fall 2024
SCADA switch to facilitate deenergization	To facilitate the ability to quickly shut off power on the line serving the high fire threat area, CPAU staff will install a remotely operable switch, providing Electric Dispatch Operators at the Utility Control Center the capability to deenergize the line immediately.	CPAU selected the location of the remote switch and will install it while completing the above- mentioned undergrounding project	Spring 2025
Fiber Optic Extension	CPAU will design and install new fiber optic cable to enhance the communications capability in the high fire threat area.	Segments of underground communication conduit are being installed along with the electric substructure work, phase by phase.	Summer 2025
Undergrounding Phase 4	Substructure work, installing boxes and padmount equipment, pulling cable, energizing electric lines, and removing electric facilities off of overhead poles.	Phase 4 substructure is under construction along Page Mill Road and Montebello Road. It is expected to reach Montebello Reservoir by year-end. Staff is discussing relocating the Public Utility easement with Mid-Peninsula Open Space to extend installation along Montebello Road beyond Montebello Reservoir.	Spring 2025