WATER | ENERGY | LIFE

CITY OF RIVERSIDE

PUBLIC UTILITIES

WILDFIRE MITIGATION PLAN

2022

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A. INTRODUCTION

Riverside Public Utilities (RPU) Wildfire Mitigation Plan (WMP) is a structured protocol to mitigate the risk of RPU's electric utility infrastructure causing a wildfire. Included are the steps, programs, policies, and procedures implemented by RPU to reduce these risks and minimize impacts to customers. It complies with the requirements of Public Utilities Code Section 8387 for publicly owned electric utilities to prepare a wildfire mitigation plan by January 1, 2020, and updated/reviewed annually thereafter.

B. POLICY STATEMENT

RPU is committed to providing the highest quality electric and water services at affordable rates to benefit the community. In order to meet its goals, RPU constructs, maintains, and operates its electrical lines and equipment in a manner that safeguards against wildfire risks.

C. PURPOSE OF THE WILDFIRE MITIGATION PLAN

The WMP is designed to meet the standards set forth by Public Utilities Code (PUC) Section 8387. PUC Section 8387 was established by California Senate Bill (SB) 901, signed into law in 2018. SB 901 tasked all private and publicly owned utilities and corporations to construct, maintain, and operate their electrical systems in a manner that minimizes the risk of wildfire and to submit a wildfire mitigation plan annually.

On July 12, 2019, Assembly Bill (AB) 1054 was chaptered along with AB 111. These two bills complemented SB 901 and amended PUC Section 8387. AB 1054 and AB 111 work together to create state government entities and budgets to administer and oversee the State's efforts to prevent, detect, and mitigate wildfires. Neither bill adds to the required content for a WMP; however, they provide additional process requirements that require each publicly owned electric utility to submit the WMP to a newly formed Wildfire Safety Advisory Board (WSAB) by July 1st of each year for review and to comprehensively revise its plan at least once every three years. Each year, the WSAB reviews the submitted WMP's from each utility and provides recommendations in an advisory opinion to improve alignment with the legislation and better mitigate wildfire risks. Utilities should incorporate the recommendations from the advisory opinion as appropriate into their annual or comprehensive WMP update.

RPU prepared and received approval of its WMP per implementation guidelines by the original January 1, 2020 deadline. RPU then, in accordance with AB 1054, submitted the WMP to the WSAB by July 1, 2020. Ongoing, RPU will submit its WMP by July 1st annually as required.

In October 2019, SB 560 was signed into law and became effective on January 1, 2020. The bill changed Public Utilities Code Section 8387 (b) (2) (G), modifying requirements for customer notification protocols for emergency de-energization. In the event of a utility de-energizing a portion of their grid infrastructure to prevent its potential to cause a wildfire, it is required to notify all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure that have facilities within the footprint of potential de-energization event. RPU also benefits as a department within the City of Riverside.

As a municipal public utility, RPU works closely with local fire agencies and other safety officials within the City of Riverside. RPU takes on a supporting role when combatting wildfires and works closely with the Riverside Fire Department and the Office of Emergency Management. RPU takes steps in preventative wildfire measures and assists the Riverside Fire Department in any capacity required when a wildfire is active in an area where RPU assets exist, even if those assets are not impacted.

D. OBJECTIVES OF THE WILDFIRE MITIGATION PLAN

Minimizing Sources of Ignition

The main objective of this WMP is to document and implement controls and mitigation measures to lessen the probability that RPU's transmission and distribution systems are the origin or are a contributing cause of a wildfire. RPU has established a structured set of measures, protocols, and personnel training identified as prudent and cost-effective methods that improve RPU's physical assets and operations defense of wildfires. RPU has integrated its methods of wildfire mitigation with State, and regulatory requirements with this WMP, and changes to the law will be reflected in subsequent versions of this document.

Resiliency of the Grid

An additional goal established in this WMP is to document current and planned measures designed to improve the resiliency of RPU's electrical grid. As part of RPU's general practices and part of the development of this plan, RPU stays up to date, evaluates new industry practices, and implements new technologies that will reduce the likelihood of an interruption (frequency) in service and improve the restoration (duration) of service. Methods already implemented to improve the grid's resiliency include but are not limited to: vegetation management, weather management, exploring new technology, avian protection, new designs, and using root cause analysis as a method of problem solving.

Identifying Unnecessary or Ineffective Actions

The third and final goal of this WMP is to establish an effective means to quantify and measure the effectiveness of specific wildfire mitigation strategies/plans. Each specific action, mitigation plan, or protocol is ranked and can be deemed unnecessary or ineffective. RPU will, in accordance with its Board, will establish a working group that will assess whether a replacement or modification is necessary or feasible. This WMP will attempt to merge cost-saving methods with methods weighted by their effectiveness to determine if cost-effective measures would produce the same or improved results.

E. ORGANIZATION OF THE WILDFIRE MITIGATION PLAN

This document includes the following features:

- Objectives of the plan
- Roles and responsibilities for carrying out the plan
- Identification of key wildfire risks and risk drivers
- Description of wildfire prevention, mitigation, response strategies, and programs
- Community outreach and education
- Metrics for evaluating the performance of the plan and identifying areas for improvement
- Review and validation of the plan
- Timelines associated with this WMP

Table 1 below summarizes the elements required in PUC Section 8387 and their location within this WMP.

Table 1: Compliance with Public Utilities Code Section 8387(b)

Requirement	Statutory Language	Plan Section
Persons Responsible	**PUC § 8387(b)(2)(A):** An accounting of the responsibilities of persons responsible for executing the plan.	Sec. II.C. Page 16
Objectives of the Plan	**PUC § 8387(b)(2)(B):** The objectives of the wildfire mitigation plan.	Sec. I.D. Page: 6
Preventive Strategies	**PUC § 8387(b)(2)(C):** A description of the preventive strategies and programs to be adopted by the local publicly owned electric utility or electrical cooperative to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks.	Sec. IV Pages 29-36

Requirement	Statutory Language	Plan Section
Evaluation Metrics	**PUC § 8387(b)(2)(D):** A description of the metrics the local publicly owned electric utility or electrical cooperative plans to use to evaluate the wildfire mitigation plan's performance and the assumptions that underlie the use of those metrics.	Sec. VI.A. Page 41
Impact of Metrics	**PUC § 8387(b)(2)(E):** A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.	Sec. VII. Pages 45-46
Deenergization Protocols	**PUC § 8387(b)(2)(F):** Protocols for disabling reclosers and deenergizing portions of the electrical distribution system that consider the associated impacts on public safety, as well as protocols related to mitigating the public safety impacts of those protocols, including impacts on critical first responders and on health and communication infrastructure.	Sec. III.C. Page 34
Customer Notification Procedures	**PUC § 8387(b)(2)(G):** Appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing of electrical lines. The procedures shall consider the need to notify, as a priority, critical first responders, health care facilities, and operators of telecommunications infrastructure.	Sec. V.B. Page 37-38
Vegetation Management	**PUC § 8387(b)(2)(H):** Plans for vegetation management.	Sec. IV.B. Page 31-32
Inspections	**PUC § 8387(b)(2)(I):** Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.	Sec. IV.B. Page 30-32
Prioritization of Wildfire Risks	**PUC § 8387(b)(2)(J): A** list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the local publicly owned electric utility's or electrical cooperative's service territory. The list shall include, but not be limited to, both of the following: i. Risks and risk drivers associated with design, construction, operation, and maintenance of the local publicly owned electric utility's or electrical cooperative's equipment and facilities. ii. Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the local	Sec. III Page 20-28

Requirement	Statutory Language	Plan Section
	publicly owned electric utility's or electrical cooperative's service territory.	
CPUC Fire Threat Map Adjustments	**PUC § 8387(b)(2)(K):** Identification of any geographic area in the local publicly owned electric utility's or electrical cooperative's service territory that is a higher wildfire threat than is identified in a commission fire threat map, and identification of where the commission should expand a high fire threat district based on new information or changes to the environment.	Sec. III Page 20-28
Enterprise-wide Risks	**PUC § 8387(b)(2)(L):** A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk.	Sec. III Page 20-28
Restoration of Service	**PUC § 8387(b)(2)(M):** A statement of how the local publicly owned electric utility or electrical cooperative will restore service after a wildfire.	Sec. IV.C. Page 33
Monitor and Audit	**PUC § 8387(b)(2)(N):** A description of the processes and procedures the local publicly owned electric utility or electrical cooperative shall use to do all of the following i. Monitor and audit the implementation of the wildfire mitigation plan. ii. Identify any deficiencies in the wildfire mitigation plan or its implementation, and correct those deficiencies. iii. Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors that are carried out under the plan, other applicable statutes, or commission rules.	Sec. VI Pages 41-44
Qualified Independent Evaluator	**PUC § 8387(c):** The local publicly owned electric utility or electrical cooperative shall contract with a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of its wildfire mitigation plan. The independent evaluator shall issue a report that shall be made available on the Internet Web site of the local publicly owned electric utility or electrical cooperative, and shall present the report at a public meeting of the local publicly owned electric utility's or electrical cooperative's governing board.	Sec. VI.D. Page 43

Additionally, Table 2 summarizes the locations of information within this document that responds to the WSAB December 2020 Advisory Opinion issued in response to their review of the first round of WMP's submitted by public utilities. RPU has incorporated the recommendations from the WSAB within this updated document and has identified the relevant location in the document where the recommended information can be found.

Table 2: WSAB Guidance Consistency Summary

WSAB Recommendation	Description	Plan Section
1 – Context Setting Information	Provide context-setting information about the POU and provide a simple guide to where the statutory requirements are addressed within the WMP.	Sec. II
2 – WMP Public Review and Approval Process	Provide a short description of the POU's public review and approval (if required) for the WMP. This description may also include a brief explanation of the funding mechanisms for wildfire mitigation efforts	Sec. VI.E.
3 – Qualified Independent Evaluator (QIE) Reporting	Identify where the POU has posted the most recent Independent Evaluator (IE) Report, and if the POU plans to enhance future IE reports, please summarize in what ways.	Secs. VI.E. and F.
4 – Develop Collective Guidelines for Future WMPs	Develop, in collaboration with POU industry associations, WMP guidelines for future WMPs, and understanding that it may take multiple cycles for POUs to integrate these recommendations into the WMPs.	Various Sections Discuss Collab.
5 – Customer Impact from IOU PSPS	Describe the potential impact investor-owned utilities (IOU) public safety power shutoff (PSPS) events could have on the POU customers and how the POU manages these impacts. • Relationship between the IOU and the POU during PSPS events • POU impact at the transmission and distribution level • Back-up generator provisions for customers • Operations and communications to proactively deenergize lines during elevated wildfire risk, absent a formal PSPS	Sec. III.F.
6 – Customer Communications Plan During Wildfires and PSPS	Describe the utility customer communication plans with respect to wildfires and PSPS, and in particular describe the methods, content and timing used to communicate with the most vulnerable customers, such as Access and Functional Needs (AFN) customers, medical baseline customers, non-English speakers, and	Sec. V

WSAB Recommendation	Description	Plan Section
	those at risk of losing water or telecommunications service.	
7 – Grid Hardening and Design	POU's system hardening and grid design programs, including: • The goals of the programs and risk the program is designed to mitigate. • Assessment of essential facilities impacted by a PSPS • System hardening measures to prevent a PSPS of those facilities	Sec. III. and Sec. IV.
8 – System Patrols and Inspections	Describe annual visual patrols on potentially impacted circuits and the risks the POU is inspecting. Describe whether and how system inspections lead to system improvements. Describe line patrols before, during, and/or after a critical fire weather event, such as a Red Flag Warning with strong winds, or following a fire that burned in areas where electric facilities are or could have been impacted.	Sec. IV.
9 – Identifying Risks	Describe options considered by POU (including through the joint efforts of the POU associations) to identify previously unidentified risks that could lead to catastrophic wildfires.	Sec. III.
10 – Identify Risks Specific to Electrical Infrastructure	Describe the particular wildfire risks associated with system design and construction such as topography and location near the HFTZ areas of another utility's service territory. Describe any G.O. 95 exempt assets and possible updates to G.O. 95 that could facilitate more resilient utility transmission and distribution assets. • Are there design or construction issues related to the utility's specific topography or geographic location that the WSAB should be made aware? • How will the utility address risks associated with facilities requiring power that abut a Tier 2 or Tier 3 HFTD? • How does the utility assess its risks associated with system design and construction? • What design and construction standards has the POU implemented that go beyond G.O. 95 or other General Order standards related to design and construction?	Sec. III. And Sec. IV.

WSAB Recommendation	Description	Plan Section
11 – Use of Situational Awareness Technology	Provide context-setting information on prevailing wind directions and speeds, differentiated by season, and average weather conditions by season. Describe how and why situational awareness technology is installed, and where on the system.	Sec. III.
12 – Vegetation Management	Describe treatment plans for all types of vegetation associated with utility infrastructure, from the ground to the sky, which includes vegetation above and below electrical lines. • Describe the reasoning behind each treatment plan and the ecological impact of the treatment options chosen. • Describe how vegetation management in the HFTZ or Fire Threat Zones differs from other areas, including within private property and urban landscaping. • Describe any enhanced vegetation management that goes beyond the minimum G.O. 95 standard. • A list of native and non-native species in the POU's Service Territory and describe how treatment methods vary. • Describe how the POU tracks new vegetation growth that occurs in areas that has previously been cleared or treated.	See Response Matrix*
13 – Qualifications of Vegetation Management Staff	List the qualifications of any experts relied upon, such as scientific experts in ecology, fire ecology, fire behavior, geology, and meteorology. Specify the level of expertise of the POU staff that manages the contractors performing vegetation management. Describe measures each POU takes to ensure that POU staff and contractors comply with or verify compliance with Cal/OSHA standards on Minimum Approach Distances (MAD).	To Be Determined
14 – Enhanced Approaches to Vegetation Management	Describe whether the POU has considered innovative and alternative approaches to vegetation management.	See Response Matrix*

*Note: RPU has prepared responses to the WSAB Recommendations. Responses to Recommendations 12 and 14 and included in that response and will be incorporated into future RPU WMPs.

SECTION II. RPU CONTEXT SETTING AND GOVERNANCE

A. INTRODUCTION TO RPU

RPU is an award-winning municipal, consumer-owned water and electric utility that has provided efficient, reliable services to the City of Riverside since 1895. The electric utility serves the entire City with a service territory of about 81.5 square miles. As of the most recent US Census data, Riverside is the largest city in the County with about 330,000 residents. It is also home to the largest employment base of any city in the Inland Empire region, with about 24,000 businesses (some of which are home based) and 134,000 primary jobs[1]. The City is the largest in Riverside County, is the county seat, and, as such, serves the entire Inland Empire region. What this means is that Riverside:

- **It is a central hub for regional government services**: City, County, State, and Federal offices that serve the western Riverside County region providing all government services, including social and medical assistance, tax assessment, courts, and legal functions. Additionally, regional emergency services, including Riverside's Emergency Operations Center, Riverside County's Operational Area Emergency Control Center, and numerous County Department Operations Centers, including Public Health and two Public Safety Answering Points (911 dispatch centers)[2].

- **It is home to the largest employment base of any city in the region,** providing over 134,000 jobs.

- **Serves as a hub for public and private medical services for the Western Riverside County region,** including three medical hospitals: Kaiser Permanente's Riverside Medical Center, Riverside Community Medical Center, and Parkview Community Hospital.

- **It is home to major educational centers that serve the region,** including the University of California -Riverside, Cal Baptist University, La Sierra University, and the Riverside Community College.

- **It is home to several regionally serving water and wastewater facilities,** including service areas, and water treatment and storage for Metropolitan Water District and Western Municipal Water District, and the Riverside Water Quality Control Plant (RWQCP), a wastewater treatment facility. The water facilities provide service to the City of Riverside and surrounding communities extending from Lake Elsinore to Norco to Corona and beyond. The RWQCP provides service to the City of Riverside

[1] U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2015). Analysis by RPU, July 21, 2019.

[2] Response of the City of Riverside to Comments and Proposals Filed September 17, 2019, Order Instituting Rulemaking to Examine Electric Utility De-Energization of Power Lines in Dangerous Conditions (Rulemaking 18-12-005) dated October 15, 2019.

and Rubidoux Community Services District, Jurupa Community Services District, and Edgemont Community Services District.[3]

Table 3 below summarizes RPU's service territory, customers, natural setting, and grid infrastructure relative to high fire threat areas.

Table 3: RPU Context Summary

	RPU	
Service Territory Size	81.5 square miles	
Owned Assets	✓ Transmission ✓ Distribution ✓ Generation	
Number of Customers Served	111,161 electric customer accounts (as of 6/30/2020)	
Population Within Service Territory	330,000 residents, 24,000 businesses with about 134,000 employees	
Customer Class Makeup	**Number of Accounts**	**Share of Total Load (MWh)**
	89% Residential <1% Government <1% Agricultural 10% Small/Medium Business 1% Commercial/Industrial	36% Residential 3% Government <1% Agricultural 18% Small/Medium Business 42% Commercial/Industrial
Service Territory Location/Topography	5.3% Agriculture 1.9% Hardwood Woodland 5.7% Herbaceous 8.1% Shrub	78.5% Urban 0.2% Water 0.3% Wetland
Service Territory Wildland Urban Interface (based on total area)	13.7% Wildland Urban Interface 8.2% Wildland Urban Intermix	
Percent of Service Territory in CPUC High Fire Threat Districts (based on total area)	✓ Includes maps Tier 2: 15.4% Tier 3: 0.5%	
Prevailing Wind Directions & Speeds by Season	Wind direction in Riverside is most often from the West between March and September, with an average wind speed of 9 mph and gusts of 22 mph. Between October and February, wind direction varies from WNW to NNE, with an average wind speed of 7 mph and gusts of 24 mph.	
Miles of Owned Lines Underground and/or Overhead	Overhead Distribution: 517 miles Overhead Transmission: 91 miles Underground Distribution: 831 miles Underground Transmission: 5 miles	
	• Explanatory Note 1 - The methodology for measuring miles is circuit miles. The total length in miles of separate circuits regardless of the number of conductors used per circuit. • Explanatory Note 2 – The Transmission lines serving the service territory have joint ownership between Southern California Edison and the City of Riverside. The lines outside of the service territory are owned and maintained by SCE.	

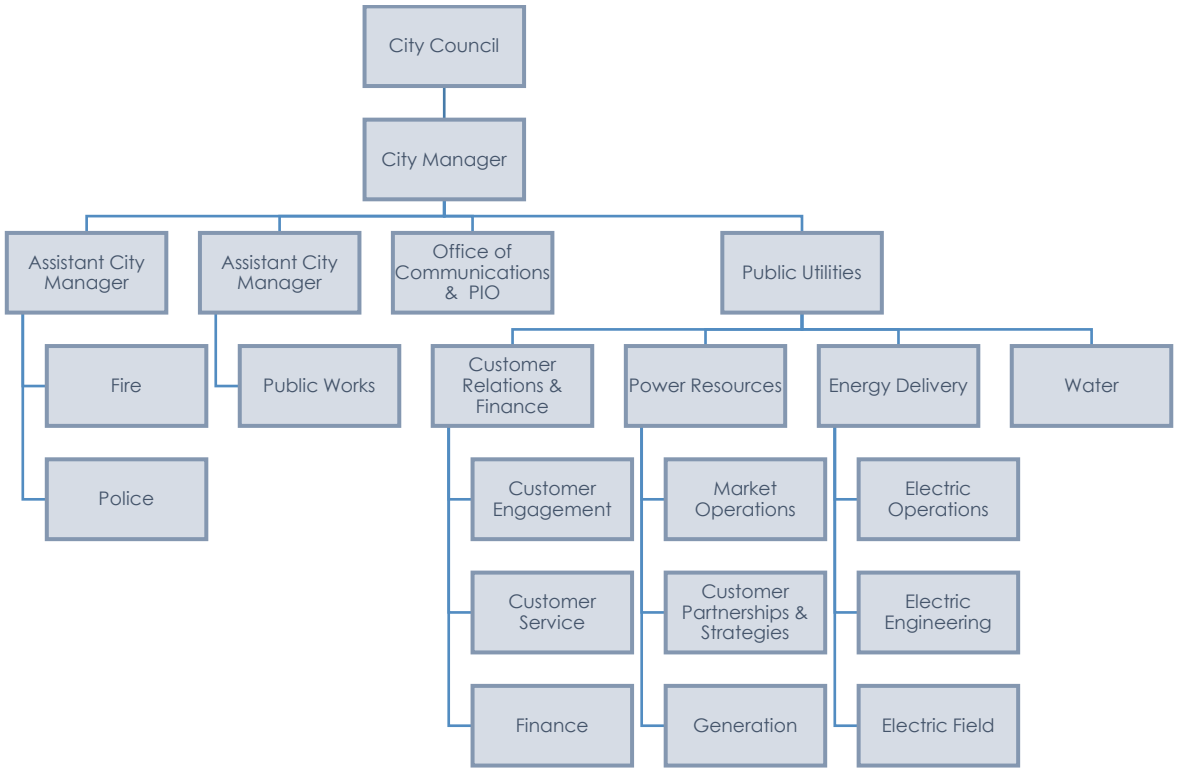
[3] Ibid.

	RPU	
	• Explanatory Note 3 – The 7 Transmission lines outside of Riverside service territory totals 22 circuit miles. It is not included in the overhead transmission total for Riverside.	
Percent of Owned Lines in CPUC High Fire Threat Districts	Overhead Distribution Lines as % of Total Distribution System (Inside and Outside Service Territory)	Tier 2: 6.9% Tier 3: 7.3%
	Overhead Transmission Lines as % of Total Transmission System (Inside and Outside Service Territory)	Tier 2: 12% Tier 3: 8.6%
Customers have ever lost service due to an IOU PSPS event?		No
Customers have ever been notified of a potential loss of service due to a forecasted IOU PSPS event?		No
Has developed protocols to pre-emptively shut off electricity in response to elevated wildfire risks?		Yes
Has previously pre-emptively shut off electricity in response to elevated wildfire risk?		No

B. CITY AND UTILITY GOVERNANCE STRUCTURE

RPU is a municipally owned utility. It is governed by the Riverside City Council. The Council appoints a Board of nine citizen volunteers who serve as an advisory body. The Board of Public Utilities provides recommendations and reviews RPU's budget and finances, rates, operations, and may conduct associated public hearings.

Figure 1: City and Utility Governance Structure (Relevant Divisions Shown)



C. WILDFIRE PREVENTION RESPONSIBILITIES

Responsibilities of RPU staff include the following;

- Operate, inspect, and maintain electrical infrastructure in a manner that will reduce the risks of wildfires.
- Work in conjunction with federal, state, and local fire management personnel as necessary or in an appropriate manner to implement RPU's WMP.
- Report fires as soon as possible, pursuant to this WMP and with existing RPU policies
- Rectify problems identified by the staff or third parties that fire protection measures have not been complied with or installed properly.
- Adhere to relevant federal, state, and industry standard requirements or laws, including industry standards mandated by the California Public Utilities Commission (CPUC).
- Regularly collect and update wildfire data required for this WMP.
- Implement additional and required training programs for all employees involved with wildfire mitigation in accordance with the WMP.
- Coordinate with the Fire Department, Water Division of RPU, Public Works, and all relevant City departments to follow-up and monitor high fire risk areas and keep up to date with new additions to the Wildfire Mitigation Plan to maintain cohesion between departments.

Table 4: Roles and Responsibilities of Citywide Emergency Response

Role	Responsibilities
RPU Executive Staff	Manages and directs RPU staff in routine and emergency operations
Energy Delivery	Design, install, operate, inspect, and maintain electrical facilities. Takes a supporting role when combatting fires. Vegetation management in and around electric distribution facilities.
Water	Takes on a supporting role when combatting fires.
Fire Department	Takes a lead role when suppressing fires.
Public Works	Vegetation management, streets, and trees.
Emergency Operations Plan (EOP) Personnel	Takes a lead role in directing and coordinating emergency efforts in a large-scale disaster event.

D. WILDFIRE RESPONSE AND RECOVERY

If the magnitude of a wildfire passes the threshold of a small structure fire to that of a city-wide emergency, the City of Riverside will implement its Emergency Operations Plan (EOP); officials will manage all emergency efforts at the Emergency Operations Center (EOC). The City of Riverside has designated emergency management staff and has identified essential officials tasked with coordinating response and recovery activities from the EOC. The EOP will only become activated:

- On order of the City Manager as Director of Emergency Services, or Assistant City Manager as the Alternate Director of Emergency Services
- At the declaration of a local emergency or upon the existence of circumstances where a declaration is likely to occur in accordance with the City's Emergency Management Ordinance
- When the Governor has proclaimed a State of Emergency in an area that encompasses Riverside
- At the declaration of a State of War Emergency
- Or at the triggering of an event identified in the EOP, which includes events such as wildfires

The EOP distinguishes between an incident and disaster. Incidents are usually a single event, small or large, with a defined geographical area and can be handled with local resources with one or a few agencies. Disasters can be single or multiple events (can have many separate incidents associated with them),demand resources beyond local capabilities, and affect a widespread population and geographic area. Disasters will warrant the activation of the EOP and will follow the EOP command structure.

During a fire emergency, the chain of command starts with the person who discovered the fire, then to public safety dispatch (911 call center), who then notifies fire dispatch. If the fire is in proximity to any RPU assets, the fire dispatcher will notify and possibly request an RPU representative. The Fire Department may request RPU to de-energize power lines in an effort to help combat the fire.

According to the EOP, RPU is responsible for coordinating the provisions of emergency power to support emergency response and recovery efforts and normalized community functions. RPU coordinates electric power, power distribution systems, fuel, emergency generators, and water systems. Riverside Public Utilities staff have the following responsibilities associated with fire prevention, response, and investigation:

- Follow protocol set by RPU and this WMP during Red Flag Warnings; and
- Take actions necessary to prevent and suppress fires resulting from electrical facilities operated by RPU, in accordance with RPU protocol and practices.

E. COORDINATION WITH WATER DIVISION

RPU has the added benefit of being able to work closely and coordinate with RPU's Water Division. Any request for assistance or resources made by the Fire Department will be followed and carried out by Water and/or Energy Delivery, depending on the request.

RPU routinely coordinates with the Metropolitan Water District, including the Mills Filtration Plant and Western Municipal Water District. Whether routine operations or an emergency situation such as a wildfire, the RPU Water Division will remain in close contact with any water district and work in conjunction with the Fire Department when warranted.

F. COORDINATION WITH COMMUNICATIONS INFRASTRUCTURE PROVIDERS

RPU regularly coordinates with infrastructure providers like AT&T and Comcast. Part owners and those who lease space on RPU assets are both notified directly in the case of an interruption or an emergency event like a wildfire. Those companies who are affected during an event will be notified directly by phone and email.

Any time maintenance or construction work interrupts a critical communications path, such as a fiber optic cable, microwave, or radio, the outage must be coordinated through RPU's Grid Control Center (GCC) and RPU Test. Some interruptions may take days to reroute communication electricity before a planned outage. Some interruptions may take days to restore normal communications. It may take weeks to prepare for the outage, complete it, and restore the circuit to normal. The current protocol includes request forms with check boxes for communications, fiber, field, substation equipment, and check boxes for the names of the people who have been notified of the outage for the Field, Substation Maintenance, Test/Communications, and Contracts. (Standard Practice, No.120.500)

G. STANDARDIZED EMERGENCY MANAGEMENT SYSTEM

As a local governmental agency, RPU has planning, communication, and coordination obligations pursuant to the California Office of Emergency Services' Standardized Emergency Management System (SEMS) Regulations, adopted in accordance with Government Code section 8607. The SEMS Regulations set roles, responsibilities, and structured communication protocols at five levels: field response, local government, operational area, regional, and state-wide. Following this structure, RPU annually coordinates and communicates with the relevant safety and local/state agencies.

RPU plays an integral role in an emergency and is tasked with working with all relevant emergency personnel to secure electrical or water components or any related disruption. According to the SEMS structure, RPU is the lead agency in coordinating electric power, power distribution systems, fuel, emergency generators, and water systems. RPU is responsible for coordinating emergency power to support emergency response and recovery efforts and normalized community functions.

The primary components within SEMS are:

- Incident Command System (ICS) – a standard response system for all hazards
- Multi-Agency Coordination System (MACS) – as it applies to SEMS, means the participation of various agencies and disciplines involved at any level of SEMS organization working together in a coordinated effort to facilitate decisions for overall emergency activities, including the sharing of critical resources and the prioritization of incidents;
- Master Mutual Aid Agreement (MMAA) and related systems – Is an agreement by cities, counties, and the State joined together to provide for a comprehensive

program of voluntarily providing services, resources, and facilities to jurisdictions when local resources prove to be inadequate to cope with a given emergency; and

- Operational Areas – is one of the five organizational levels in SEMS. An Operational Area consists of a county and all political subdivisions within the county area. Each county's governing bodies and the political subdivisions in the county shall organize and structure their operational area. The county will be the lead agency for the Operational Area unless another arrangement is established by agreement. Operational Areas facilitate the coordination of resources between its member jurisdictions. Operational Areas also serve as a communication and coordination link between the Region and State level EOCs and local government EOCs within the Operational Area. The County of Riverside serves as the Operational Area coordinator.

In accordance with the SEMS structure, preparation is done through advanced planning at the county level, including coordinating public, private, and nonprofit organization's efforts. Riverside County stands as the Operational Area and is guided by the Riverside County Disaster Council, which comprises representatives of County Departments and other members as appointed by the Board of Supervisors. The Operational Area includes local and regional organizations that bring relevant expertise to the wildfire mitigation, prevention, and recovery planning process. These members include: Riverside school districts (including those of surrounding cities that may be affected), Riverside Public Utilities, Riverside Fire Department, non-profits (such as the Red Cross), local hospitals, special districts, communications providers, and other similar organizations not included in this list.

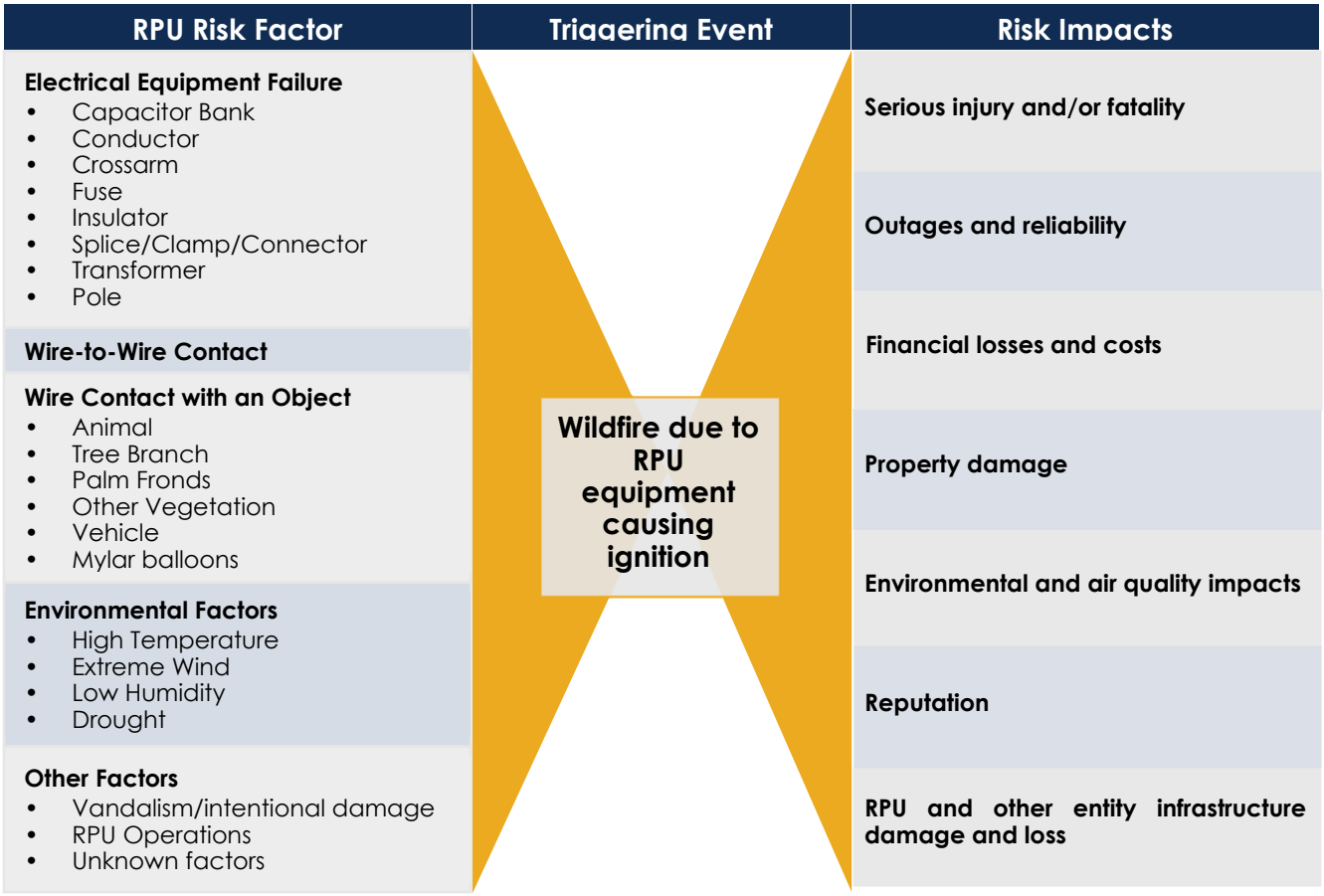
RPU follows the guidelines and is a member of the California Utilities Emergency Association (CUEA), the American Public Power Association (APPA), the Water Alert Response Network (WARN), and the California Municipal Utilities Association (CMUA), which supports the communications between utilities during emergencies and provides guidance to the design, operation, and operation of utility assets. RPU also participates in the Western Energy Institute (WEI) Western Region Mutual Assistance Agreement, a bilateral agreement between utilities to ensure assistance in an emergency across several western states.

SECTION III. WILDFIRE RISK ANALYSIS AND RISK DRIVERS

A. RPU OPERATIONS AND EQUIPMENT RISK FACTORS

RPU identified the contributing factors that may result in an RPU ignition of a wildfire and the consequences of a utility caused wildfire. The bowtie method for assessing risk is utilized by almost all electric utilities in California and is shown below. This method

Figure 2: RPU Risk Factor Bowtie Analysis



B. ELECTRICAL EQUIPMENT FAILURE

Electrical equipment fails for a variety of reasons, including aging and inadequate maintenance. Ignition of a fire may result if these failures cause sparking or release of material from the equipment. Failure of power poles or fallen power lines can cause fires when they come into contact with vegetation due to arcing and sparking.

Wire-to-Wire Contact: Wire-to-wire contact (when two power lines come into contact or come near one another) may result in arcing and sparking that can fall into vegetation resulting in a fire.

Wire Contact with an Object: One of the most significant risks plaguing almost all electrical companies are trees, debris, or other objects coming into contact with electrical lines. As with wire-to-wire contact, the result may be arcing or sparking that has the potential to ignite vegetation or other objects.

Other Factors: Vandalism or operational activities can result in equipment sparking or arcing and present the potential to ignite vegetation.

Environmental risk factors are discussed in detail in the next section.

C. ENVIRONMENTAL RISK FACTORS AND CLIMATE CHANGE

Within RPU's service territory and the surrounding areas, the primary risk drivers for wildfire include:

- Extended Drought
- Vegetation
- Increased Temperature / Low Humidity
- High Wind
- Terrain
- Changing Weather Patterns Due to Climate Change

Each of these risk drivers is discussed below.

Extended Drought: Extended droughts, coupled with changing weather patterns, present a continual threat and exacerbate wildfire impact. Droughts lead to vegetation drying, which provides wildfires with a ready, more combustible fuel source (see discussion below). In addition, lack of water can lead to accelerated tree decay, which then presents an increased hazard to adjacent energized power lines due to the increased likelihood that a branch or the entire tree could fall and make contact with the energized line.

Vegetation: A significant factor contributing to large wildfires is having readily available dry/dead vegetation, a highly combustible fuel source. In the recent spurt of wildfires experienced by California in recent fire seasons, vegetation management, or lack thereof, was a leading cause to why those fires were so damaging. RPU has most of its assets in urban zones, and the few that lie in high fire threat districts (HFTD) are maintained and receive extra scrutiny. Vegetation management also includes monitoring tree and tree-limb growth near RPU assets.

Increased Temperature / Low Humidity: Summers in Riverside tend to be hot and arid, with minimal cloud coverage. Monthly averages for July, August, and September have average highs of above 90°F. In autumn, humidity may drop into the single digits. Winters

are mild, cool, with partial cloud coverage, and are relatively wet with an average of 10.33 inches of precipitation annually. Additionally, as temperatures increase, night-time cooling is also decreasing in some years. High temperatures and lower humidity increase the strain on electrical infrastructure equipment as residents increase their electricity use primarily through the use of air conditioning. Electrical equipment is also strained during these events.

High Winds: A feature of the Inland Empire is a wind pattern known as the Santa Ana winds[4]. The Santa Ana winds are accompanied by hot and dry weather and generally occur in autumn. Autumn in Southern California tends to be some of the hottest and driest times of the year. Southern California also typically has its lowest relative levels of humidity during this part of the year. When winds are marginal, upon ignition, fires may proliferate. When winds are extreme, fires will have extreme growth upon ignition, will burn very intensely, and be uncontrollable. Coupled with dry weather or drought conditions, high winds or Santa Ana winds can lead to a disastrous situation in which we can expect, extensive, fast-moving wildfires. The USDA Forest Service and Predictive Services provide a useful tool for monitoring the threat and fuel moisture level via the National Wildfire Coordinating Group website[5].

Terrain: The City of Riverside occupies a diverse range of terrain. Although most of the City is urbanized, there lie intermittent sections of rural and undeveloped land with large hills, including the City's landmark Mount Rubidoux, which lie along the perimeter of the City and extend into the City along natural land parks and preservation areas. These areas have steep terrain that is hard to access.

Additionally, a State Responsibility Area borders the City of Riverside, known as Box Springs Mountain Reserve and Box Springs Park. The State Responsibility Area within Riverside borders very urban zones, and any ignition from Box Springs can potentially impact the urban zones of the City of Riverside, including the University of California, Riverside.

Climate Change and Changing Weather Patterns: Climate change presents a significant long-term challenge and is considered a threat multiplier. As current trends continue, climate change is causing:

- Increased average and peak temperatures
- Shorter rainy seasons
- Extended fire season
- Extended time range for the Santa Ana winds that fan wildfires
- Longer duration and more frequent drought conditions

These conditions result in the high growth of weed vegetation during the rainy or wet years that dried out in the drought years. Perennial plants and trees are stressed due to

[4] The National Weather Service defines Santa Ana winds as "Strong down slope winds that blow through the mountain passes in southern California. These winds, which can easily exceed 40 miles per hour (18 m/s), are warm and dry and can severely exacerbate brush or forest fires, especially under drought conditions."

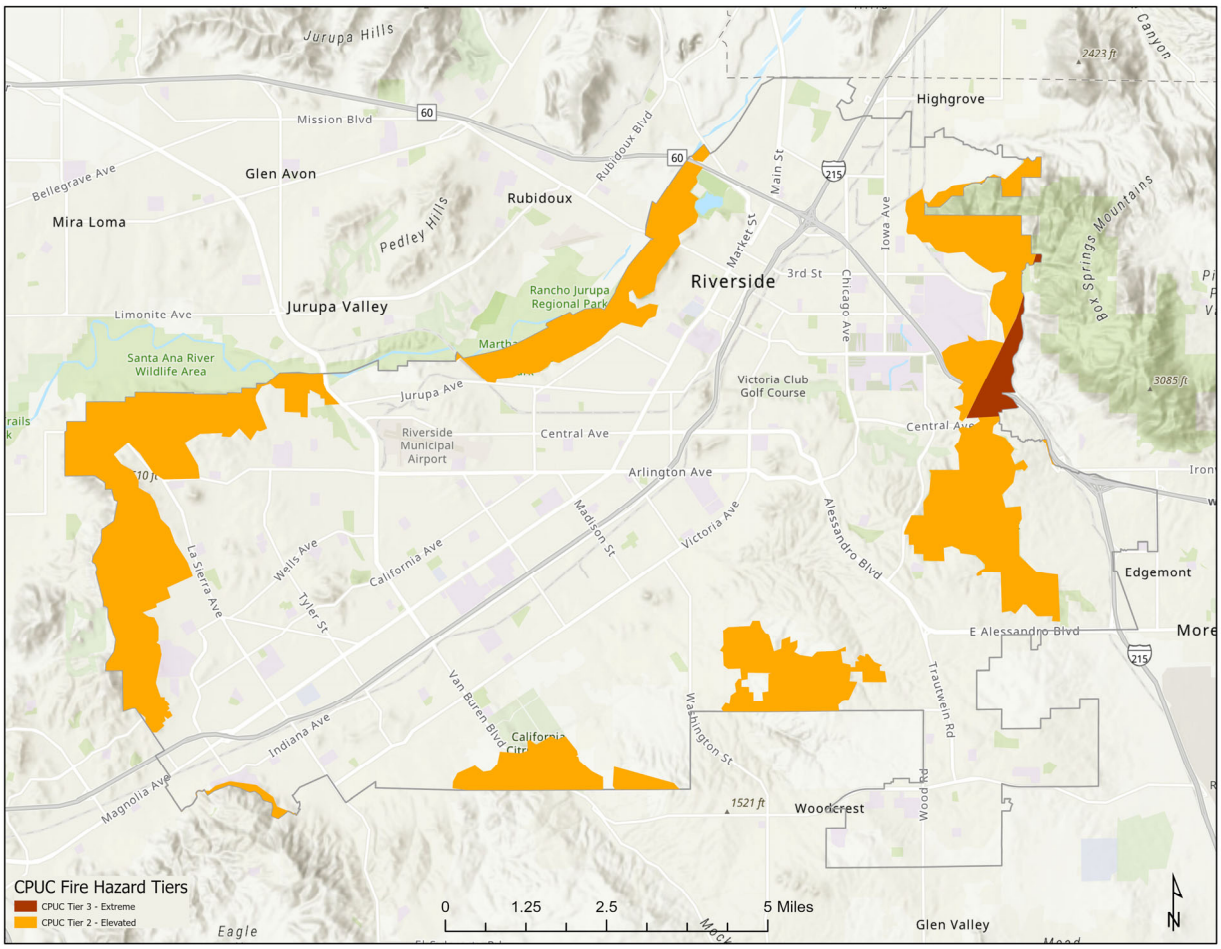
[5] https://fsapps.nwcg.gov/psp/sawti

the extended dry periods and increasing temperatures during the summer and autumn seasons. The result is increasingly dry vegetation that provides fuel for wildfires.

D. HIGH FIRE THREAT DISTRICT (HFTD)

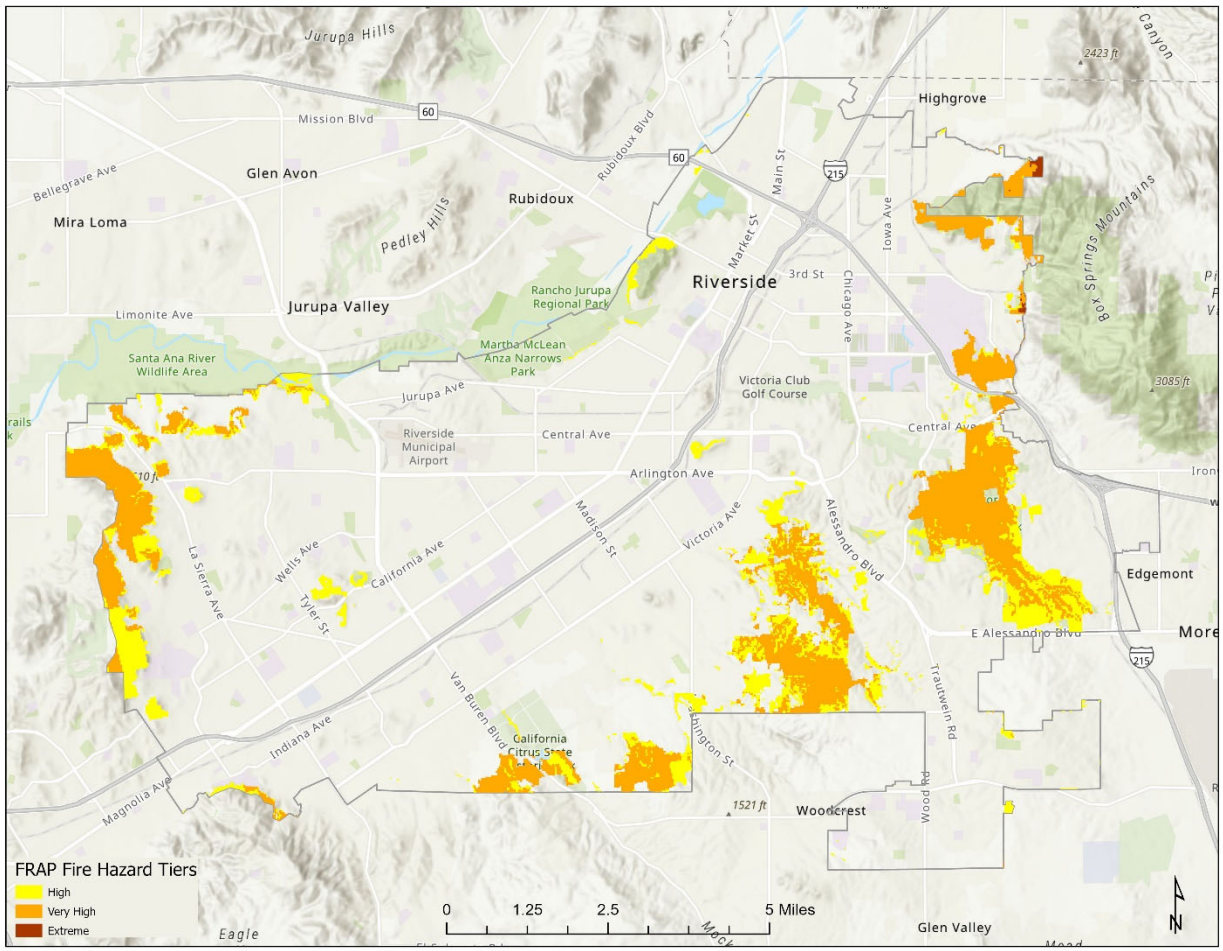
RPU directly participated in the development of the California Public Utilities Commission's (CPUC) Fire-Threat map[6], which designates High Fire-Threat Districts (HFTD). RPU served as a territory lead in the threat map development and worked with utility staff and local fire and government officials to identify RPU's service territory areas that are at an elevated or extreme risk of power line ignited wildfires. RPU considers the Fire Hazard Severity Zones prepared by CalFire as part of their Fire and Resource Assessment Program. RPU has taken both sets of data into account in its design, planning, engineering, construction, inspection, maintenance, repair, and clearance practices, where appropriate.

Figure 3: High Fire Threat Districts in RPU Service Territory



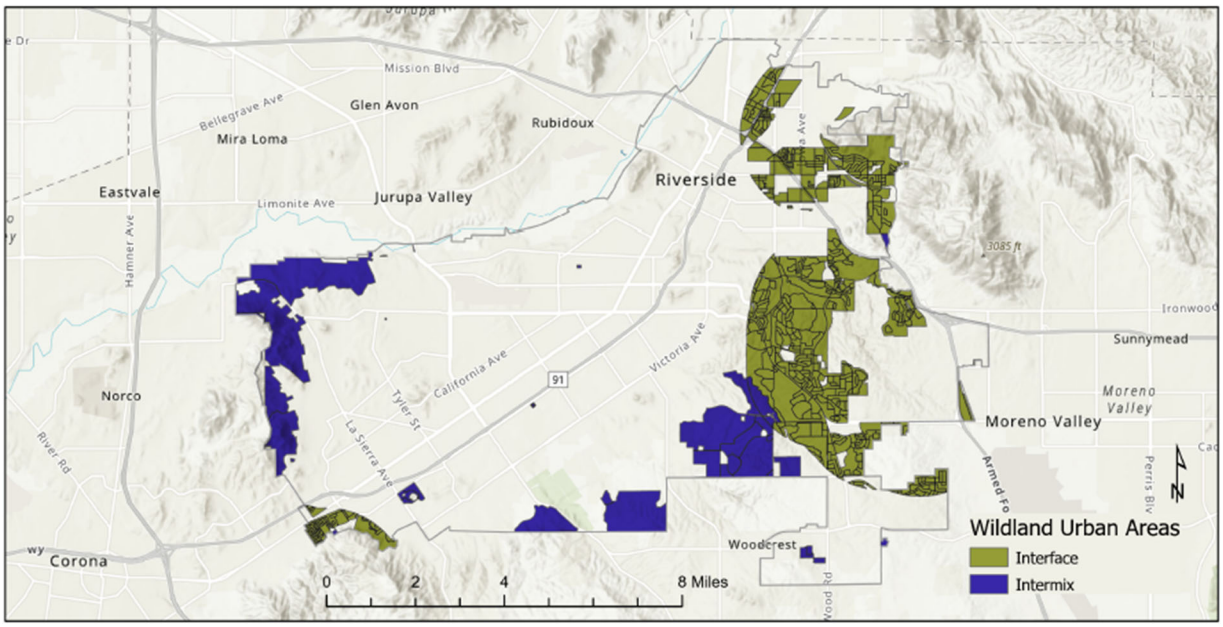
[6] https://ia.cpuc.ca.gov/firemap/

Figure 4: CalFire Fire and Resource Assessment Program Fire Hazard Severity Zones



Additionally, RPU has identified areas in the City that are wildland/urban interface and intermix areas. Almost 14% of the land area in the City is considered a wildland urban interface, and slightly more than 8% of the urbanized land area mixes with wildland areas. These areas are also at greater risk due to wildfire in adjacent to or having urban area mixes with wildlands areas. The major urban/rural interface areas of high-fire risk include Mount Rubidoux, the Santa Ana River Basin, Lake Hills, Mockingbird Canyon/Monroe Hills, Sycamore Canyon, Box Springs Mountain, and La Sierra/Norco Hills.

Figure 5: Wildland Urban Interface Areas



E. RPU ASSETS IN HIGH FIRE HAZARD LOCATIONS

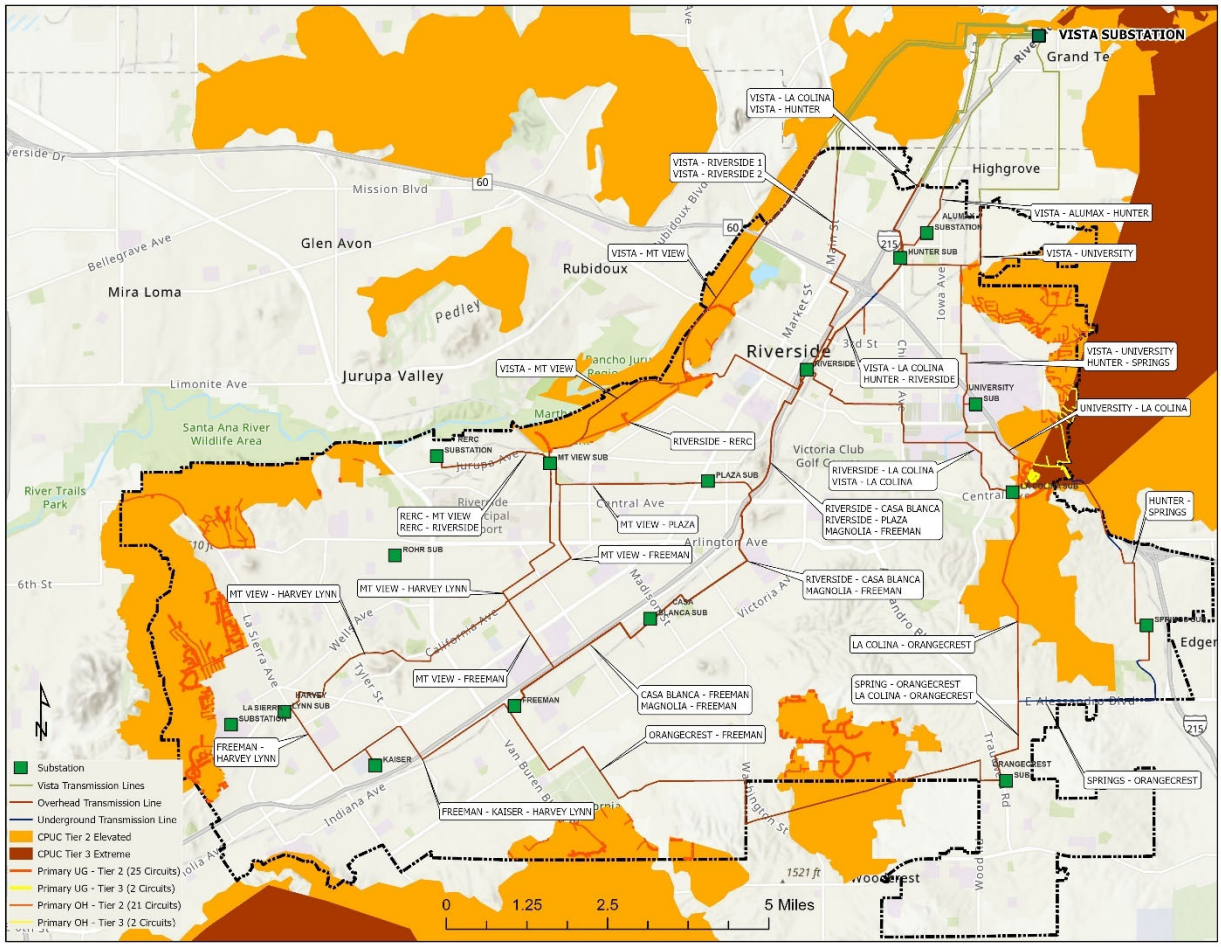
RPU Energy Delivery Engineering (EDE) has identified which circuits have overhead facilities in the elevated or extreme high fire threat districts. EDE maintains the current fire threat information from the Cal Fire Map from their website showing Local Responsibility Areas. Engineering identifies which circuits have overhead structures in those elevated or extreme fire danger zones, as shown in Figure 6. These structures are located in various areas around the perimeter of the City.

Table 5: Summary of RPU Assets in HFTD

	Total	Tier 2 OH		Tier 3 OH	
	Circuit-Miles	Circuit-Miles	%	Circuit-Miles	%
Overhead Distribution	517	31.9	6.2%	2.8	0.5%
Overhead Sub-Transmission*	91	11.1	12.2%	0.003	0.00%
Total Overhead Circuit-Miles	**608**	**43.0**	**7.1%**	**2.8**	**0.5%**

*Note: SCE owns and operates seven transmission lines extending from SCE's Vista Substation. These lines comprise 22 miles of overhead transmission that feed into RPU and are not included in the table. RPU takes ownership of these lines at the boundary of its service territory. Lines in RPU territory are included in the overhead transmission of the table.

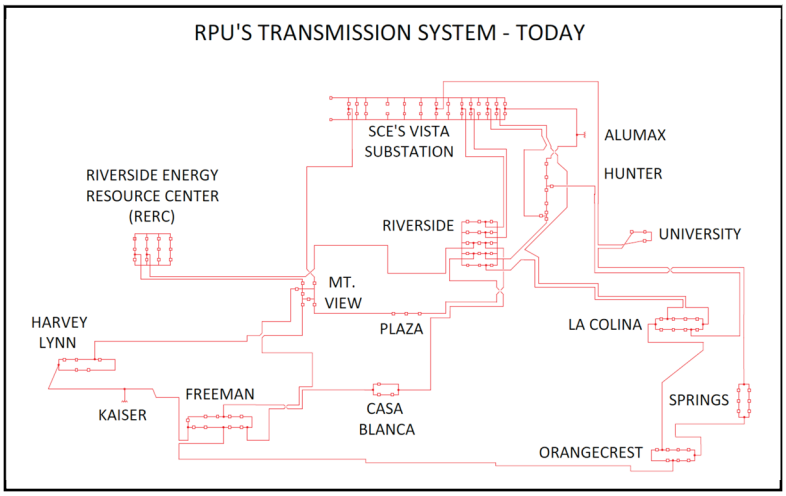
Figure 6: RPU Grid Infrastructure and HFTD



F. COMMUNITY RISK TO AND FROM OTHER UTILITIES WILDFIRE MITIGATION PLANNING EFFORTS

RPU is a Participating Transmission Owner (PTO) with the California Independent System Operator (CAISO). While its risk to other utilities is limited to the risk that a wildfire ignited by RPU equipment could spread into the other utilities service area, RPU's customers may be significantly impacted by the efforts of SCE to prevent wildfires.

Figure 7: Single Line Diagram of SCE's Vista Substation and RPU Transmission System



The majority (97%) of the electricity served to the community flows through a single point of interconnection to the bulk electric system located at Southern California Edison's (SCE) Vista Substation. Seven 69kV transmission lines from the Vista Substation connect to RPU's distribution system, of which three traverse a Tier 2 fire hazard area.

SCE, as part of a Public Safety Power Shutoffs (PSPS), intended to minimize their risk of causing a wildfire, could turn off some or all the 69kV transmission lines providing electricity to RPU and the City of Riverside. RPU's internal generation includes two natural gas generation facilities (Riverside Energy Resource Center and Springs Generation) and a small solar photovoltaic system with a combined capacity of X MWs. Internal generation would only support a small portion of RPU's customers if a PSPS event occurred, particularly during a high-heat, Santa Ana wind event. The result of a PSPS event on a portion or all of these transmission lines would be rotating outages for all of RPU's service territory[7].

As noted previously in Section II: RPU Context Setting and Governance above, Riverside is a regional hub, providing services that extend well beyond its city limits and RPU's service territory. A PSPS event on SCE's transmissions lines from the Vista Substation would impact residents, businesses, and these regional services. Because of this, RPU actively participated and had party status in the CPUC Rulemaking 18-12-005[8,9] and subsequent Investigation 19-11-013[10]. RPU specifically sought improved and continuous communications between SCE and RPU during conditions that could result in a PSPS

[7] Response of the City of Riverside to Comments and Proposals, Order Instituting Rulemaking to Examine Electric Utility De-Energization of Power Lines in Dangerous Conditions (Rulemaking 18-12-005), October 15, 2019.

[8] Ibid.

[9] City of Riverside Comments on Proposed Decision Adopting Phase 2 Updated and Additional Guidelines for De-Energization of electric Facilities to Mitigate Wildfire (Rulemaking 18-12-005, May 18, 2020.

[10] Response of the City of Riverside to the Order Instituting Investigation, Order Instituting Investigation of the Commission's Own Motion of the Late 2019 Public Safety Power Shutoff Events (Investigation 19-11-013), January 10, 2020.

event, sought assurance that SCE would take preventative measures to mitigate the risk of their infrastructure and equipment causing a wildfire, and actions to mitigate and monitor risks during an event.

To date, SCE has not initiated a PSPS event on the transmission line from the Vista Substation. Should an event occur, SCE has established notification procedures that include notification up to 7 days in advance of a potential shutoff. RPU will follow the same procedures for customer notifications and support outlined in this document in Section V: Community Impacts and Support During an Emergency.

SECTION IV. WILDFIRE PREVENTATIVE STRATEGIES

This section outlines and describes the wildfire preventative strategies undertaken to address each type of risk.

Table 6: Preventative Strategies Matrix

Preventative Strategy	Electrical Equipment Failure	Conventional Fuse Operation	Wire Contact with Foreign Object	Wire Contact with Vegetation	Environmental
Design and Construction Standards					
Deteriorated Pole Replacements	✓		✓	✓	
Pole Loading Assessments & Remediation	✓			✓	
Overloaded Transformer Replacements	✓	✓			
Distribution Construction Standards Improvements		✓	✓	✓	
Grid Resiliency Devices	✓	✓	✓	✓	
Inspections and Maintenance					
Annual Patrol Inspection (GO 165)	✓		✓	✓	
Intrusive Pole Inspections	✓			✓	
Enhanced Infrared Inspections	✓	✓			
Vegetation Management Program		✓		✓	✓
Operational Practices					
De-Energization	✓	✓	✓	✓	✓
Restoration of Service	✓	✓	✓	✓	
Workforce Training	✓	✓	✓	✓	✓
Reclosing Policy	✓	✓	✓	✓	✓
Block Reclosing during RFW			✓	✓	✓
Line Patrol after outage event during RFW		✓	✓	✓	✓
Situational and Conditions Awareness					
Weather Monitoring	✓	✓	✓	✓	✓
Use of Big Data and Predictive Analytics	✓	✓	✓	✓	✓
WMP Mapping and HFT areas kept current	✓	✓	✓	✓	✓

A. DESIGN AND CONSTRUCTION STANDARDS

RPU's electric facilities are designed and constructed to meet and exceed requirements from relevant federal, state, and industry standards. RPU uses CPUC General Order (GO) 95 as a key standard for design and construction standards for overhead facilities. RPU meets or exceeds all standards outlined in GO 95. Furthermore, RPU also considers minimum requirements outlined in the

National Electric Safety Code (NESC) when applicable standards are not available or detailed in GO 95.

Distribution Fusing policy

RPU has proactively increased distribution lateral fusing to selected locations. Increased lateral fusing can act as an indicator and direct appropriate overhead line maintenance to reduce the frequency of troublesome fuse interruptions, where previously, no cause was found on a circuit patrol, and repeated interruptions occurred before the cause of the outage was determined. Lateral fusing can reduce the amount of conductor and equipment damage due to fault current, which reduces overall repair time (conductor burn-down).

RPU has changed its protection scheme to primarily "fuse blowing," meaning a fault on the system downstream of a fused tap or mainline fuse will be cleared by the fuse and not the upstream distribution feeder relay. Implementing a fuse-blowing scheme will decrease the number of momentary interruptions and isolate faults at the protective device closest to the fault location.

B. INSPECTIONS

RPU meets and exceeds the minimum inspection requirements provided in CPUC GO 165[11] and CPUC GO 95, Rule 18. Following these rules, RPU inspects electric facilities in the HFTD more frequently than the other areas of its service territory. Furthermore, RPU staff leverage their knowledge of specific environmental and geographical conditions to determine when areas outside the High Fire-Threat District may require more frequent or more thorough inspections.

If RPU staff discovers a facility in need of repair that is owned by an entity other than RPU, they will issue a notice to repair to the facility owner and work to ensure that necessary repairs are completed promptly.

RPU works to ensure that all inspections to be performed within the High Fire-Threat District are completed before the beginning of the historic fire season. However, in California, the fire season is adjusted based on local conditions. RPU monitors drought conditions and other relevant factors throughout the year to determine if inspections should be completed in a shorter timeframe.

The RPU Inspection Program requires overhead facilities to have a patrol inspection annually and a detailed inspection every five years. Transmission lines are patrolled by helicopter about three times per year, in addition to the patrol and detailed inspections. The patrol inspection is sufficient to identify gross defects. A detailed inspection involves a close visual inspection of the facility that is intended to identify minor defects. Defects that are identified are scheduled for repair in priority order, per GO 95 Rule 18B. These

[11] http://docs.cpuc.ca.gov/PUBLISHED/GENERAL_ORDER/159182.htm

corrective action timeline requirements range from immediately to 60 months, depending on the level of potential impact to safety or reliability.

Vegetation Management

Vegetation management is crucial in maintaining a reliable overhead electrical grid. All California state utilities are required by law to maintain vegetation surrounding electrical assets to:

- Prevent electrocution during a storm or accident
- Reduce the risk of fire
- Prevent unnecessary power outages

RPU meets or exceeds the minimum industry standard vegetation management practices. For both transmission and distribution level facilities, RPU meets: (1) Public Resources Code section 4292[12]; (2) Public Resources Code section 4293[13]; (3) GO 95 Rule 35 (as shown in the tables below); and (4) the GO Appendix E Guidelines to Rule 35. These standards require increased clearances in the High Fire-Threat District. The recommended time-of-trim guidelines do not establish a required standard but do provide useful guidance for utilities. RPU will use specific knowledge of growing conditions and tree species to determine the appropriate time of trim clearance in each unique circumstance.

Table 7: GO 95, Rule 35

Case	Type of Clearance	Trolley Contract, Feeder and Span Wires: 0 to 5kV	Supply Conductors and Supply Cables: 12.47kV	Supply Conductors and Supply Cables: 34.5kV	Supply Conductors and Supply Cables: 69kV
13	Radial clearance of bare line conductors from tree branches or foliage	18 inches	18 inches	18 inches	18 inches
14	Radial clearance of bare line conductors from vegetation in the High Fire-Threat District	18 inches	48 inches	48 inches	48 inches

[12] Public Resources Code Section 4192 states, "… any person that owns, controls, operates, or maintains any electrical transmission or distribution line upon any mountainous land, or forest-covered land, brush-covered land, or grass-covered land shall, during such times and in such areas as are determined to be necessary by the director or the agency which has primary responsibility for fire protection of such areas, maintain around and adjacent to any pole or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole, a firebreak which consists of a clearing of not less than 10 feet in each direction from the outer circumference of such pole or tower…."

[13] Public Resources Code 4293 explicitly states, "… maintain a clearance of the respective distances which are specified in this section in all directions between all vegetation and all conductors which are carrying electric current: (a) For any line which is operating at 2,400 or more volts, but **less than 72,000 volts, four** feet."

The table below lists recommended minimum clearances that apply to RPU's assets and should be established, at the time of trimming, between the vegetation and the energized conductors and equipment components. RPU, at its discretion, may see the need to exceed clearances listed above and below to ensure compliance and public safety until the next scheduled maintenance. RPU takes various factors into account when determining additional clearances, which include: line operating voltage, length of span, line sag, planned maintenance cycles, location and type of vegetation, vegetation growth rate and characteristics, local climate, fire risk, and vegetation trimming requirements that apply to State Responsibility Area lands pursuant to Public Resource Code Sections 4102[14] and 4293.

Table 8: GO 95, Rule 35, Appendix E Guidelines – Radial Clearance at Time of Trimming

Voltage of Lines	Table 3 Case 13 (non-HFTD)	Table 3 Case 14 (HFTD)
Radial clearances for any conductor of a line operating at 2,400 or more volts, but less than 72,000 volts.	4 feet	12 feet

When working in the HFTD, RPU evaluates every individual tree that has the potential to strike overhead facilities if it were to fail on a yearly basis. RPU performs more frequent and detailed inspections of these particular trees. The additional trimming is based on the previous year's outages (location) caused by tree contact, palm frond, and/or palm seed contact. In cases where hazard trees (dead, dying, diseased, or leaning) could strike overhead facilities, RPU will work with the landowner to remove the tree or portion of the tree that poses a risk.

Community Vegetation Management Education

In addition to the vegetation management RPU practices, Riverside property owners are encouraged to practice their own forms of vegetation management. The City of Riverside Fire Department has distributed a Wildfire Action Plan called "READY! SET! GO!" and is supported by the Riverside Country Fire Chiefs Association. "READY! SET! GO!" is aimed at individual homeowners to first, have a plan for when a wildfire threatens your home; and second, to recommend ways to make your property more defensible against encroaching wildfires, with an emphasis on vegetation/fuel management.

State Responsibility Areas

State Responsibility Areas (SRA) are within the City of Riverside. East of the University of California, Riverside, lies the Box Springs Mountain Reserve, which is designated as an SRA. The Box Springs Mountain Reserve is not in proximity to any RPU substations. However, any wildfire started in the Box Spring Mountain Reserve can travel and impact the highly

[14] "State responsibility areas" means areas of the state in which the financial responsibility of preventing and suppressing fires has been determined by the board pursuant to Section 4125, to be primarily the responsibility of the state.

urban surrounding areas, and therefore has the potential to interfere with overhead lines within the area.

C. OPERATIONAL PRACTICES

De-Energization

Wildfire threats and de-energization are unlikely to come from RPU's distribution system. RPU has the authority to preemptively shut off power due to fire-threat conditions at their discretion; however, this option will only be used in rare and necessary circumstances, such as a request from the Fire Department. When a public safety issue is validated by RPU, if necessary, RPU will de-energize electric facilities only until the public safety issue is resolved.

De-energization that can affect Riverside may also result from threats posed by or to the statewide transmissions system on the sub-transmission lines from the Vista Substation and operated by Southern California Edison (SCE). These sub-transmission lines provide RPU's one point of interconnection to the regional grid.

In the event that SCE de-energizes the sub-transmission lines from the Vista substation, RPU will have to evaluate whether internal generation will be sufficient to serve the customer load. RPU may need to initiate rolling blackouts or de-energize specific areas of the distribution system to ensure that electric service is maintained to critical circuits, such as those serving hospitals and other critical facilities.

RPU maintains communications with SCE at all times that a PSPS event could potentially occur.

Restoration of Service

RPU will not restore service until the area of trouble is fully isolated and fully patrolled. When RPU gets the all-clear from ground crews and emergency personnel, RPU will restore service. RPU will follow this same protocol in the event of a wildfire.

Workforce Training

RPU has implemented work rules and complementary training programs for its workforce to help reduce the likelihood of the ignition of wildfires. Following the SEMS structure, RPU participates in annual training exercises. RPU only conducts wildfire training when it has been one year since a wildfire activation. However, this does not include routine property or structural fires.

Prior to the wildfire season, RPU leadership meets with the City of Riverside's Fire Marshall to go over areas of concern that RPU and the Fire Department might have. Areas of concern like river-bottoms and elevated/extreme fire districts are evaluated if additional resources or actions are needed.

Reclosing Policy

Reclosing takes place on RPU's 4kV and 12kV distribution systems. RPU does not reclose 34.5kV and 69kV sub-transmission lines. The topography of the distribution circuit determines what the reclosing cycle will be. This is as follows:

- If the distribution circuit is fully underground, reclosing is not enabled
- If the distribution circuit is less than 50% underground, two reclosing cycles occur before the distribution circuit is locked open
- If the distribution circuit is more than 50% underground, one reclosing cycle occurs before the distribution circuit is locked open

Relay settings cannot globally be changed based on adverse weather conditions. However, Grid Control Operators have the ability to remotely block circuit breaker reclosing on all 4kV or 12kV distribution circuits. Grid Control shall monitor wind speed readings at Riverside and Freeman Substations to determine if wind speeds meet or exceed 49.5 mph. This threshold is 70% of the Grade A construction standard. The SCADA system scans all the points in the system every 2 seconds. The level 1 alarm for both wind speed points has been set to 49.5 mph. When the wind speed exceeds the level 1 alarm, RPU Grid Control Center (GCC) shall:

1. Block automatic reclosing on circuits serving overhead facilities in high fire-threat areas
2. Notify Public Safety Dispatch that the Public Utilities Fire Prevention Plan has been implemented
3. Notify the RPU Red Flag Notification distribution list, including the Fire Department Battalion Chiefs, by using the Outlook email distribution list "RPU Electric Ops/Field - RFD Fire Coordination" that the Public Utilities Fire Prevention Plan has established

If an outage occurs on one of these circuits:

1. Overhead facilities in high fire-threat areas must be patrolled and found to be clear of trouble before RPU Grid Control Center (GCC) restores service to those facilities
2. Normal service restoration procedures may be used once the overhead facilities in the elevated or extreme fire-threat areas have been isolated

Once the Red Flag Warning expires and wind speeds drop below trigger levels, Grid Control will return to normal operations.

D. SITUATIONAL AND CONDITIONS AWARENESS

Weather Monitoring

RPU monitors current and forecasted weather data from a variety of sources, including:

- United States National Weather Service (NWS)[15]
- United States Forest Service Wildland Fire Assessment System[16]
- National Fire Danger Rating System[17]
- National Interagency Fire Center – Predictive Services for Northern and Southern California[18]
- The Weather Channel
- Substations equipped with weather monitoring, specifically observe wind speeds and temperature

RPU assigns one of two operating conditions based on the relevant weather data and knowledge of local conditions:

Normal: During normal conditions, no changes are made to operations or work policy.

Red Flag: If the National Weather Service declares a Red Flag Warning for any portion of RPU's service territory, the Grid Control Center (GCC) shall monitor NWS or other sources to determine when Red Flag Warnings are issued that include the City of Riverside. GCC will issue a red flag warning alert using the "PU-Red Flag Notification." GCC will review the circuit maps on the attached list of circuits to determine if the circuits are in normal configuration or if the overhead portions in the elevated or extreme fire threat districts have been transferred to other circuits. On-duty electric troubleshooters will be notified and assigned to conduct patrols of overhead facilities in elevated or extreme fire threat areas. An electric service crew will be notified and assigned to clear any palm frond or debris from overhead lines in elevated or extreme fire threat districts. Electric crews will be assigned to correct any deficiencies on overhead facilities in elevated or extreme fire threat districts identified by the troubleshooter during patrol.

Use of Big Data and Predictive Analytics

RPU collects data from a wide variety of resources in addition to weather monitoring data. The use of outage data is a primary method for gathering and assessing grid infrastructure. RPU plans to update its outage management system to incorporate data that will help to evaluate the fire risk posed by electric equipment.

[15] https://www.weather.gov/fire/
[16] https://www.wfas.net/
[17] https://www.wfas.net/images/firedanger/subsets/fdc_f_cs.png
[18] https://www.predictiveservices.nifc.gov/outlooks/monthly_seasonal_outlook.pdf

RPU's current outage management system collects information on outages, including the cause of ,the outage, and a circuit location and equipment involved. Refining this information so that it collects more information on the cause of the outage will facilitate better predictive analysis, provide an assessment of the risks electric equipment poses, and inform decisions making addressing equipment upgrades and replacement technology.

RPU anticipates that the process to update and refine the outage management system will take several years and will be ongoing.

WMP and HFTD Data Maintenance

RPU has been developing data for the implementation and monitoring of the WMP. RPU will ensure that this data is maintained and kept current to ensure that relevant and recent data are used to update the WMP annually and to perform monitoring processes.

SECTION V. COMMUNITY IMPACTS AND SUPPORT DURING AN EMERGENCY

A. IMPACTS ON PUBLIC SAFETY

As described previously, threats on the distribution system will likely only cause localized, circuit level impacts or power outages. The public safety impacts from such power outages affect three primary groups of entities:

- Impacts to customers, particularly customers with medical support devices or needs that require electricity support (e.g., customers on RPU's Utilicare rate)
- Impacts to public safety infrastructure including, hospitals and other medical facilities and other emergency response facilities
- Impacts to critical support infrastructure such as traffic signals, streetlights, water systems, sewage systems, telecommunications facilities, and cell tower facilities

In all three cases, RPU initiates communications protocols that include monitoring, public notifications, and customer or entity specific notifications. In all cases, RPU intends to provide as much advance notice as possible to the potential of an event. The type of event, the significance of the event - whether circuit level compared to system-wide, and duration of the event will determine the level extent of the outreach to customers. Customer notification procedures are described in the following section.

B. CUSTOMER NOTIFICATION PROCEDURES

RPU recognizes that shutting off power may represent the safest response to wildfire hazard events that increase the likelihood of a wildfire from the electrical grid. To respond to such events, RPU will follow the procedures established in its Emergency Operations Plan (EOP), which conforms to the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS).

The actions identified and expected to be undertaken in the EOP focus on the following:

- Protection of lives, property, and the environment
- Maintenance and continuity of critical governmental operations
- Ensure a timely transition to short term and long-term recovery.

For communications specifically related to wildfire and outage hazard events, RPU will utilize multiple communications channels to notify provide information to customers, partner agencies, and emergency response entities. The City of Riverside's 311 call center, the RPU customer service center, customer program and services representatives, and City and RPU communications teams and public information officers all play a role in providing information throughout the event.

RPU will begin general notifications as early as 72 hours in advance of the hazard event. However, communications will continue throughout an event and until power is restored on any de-energized lines.

A variety of communications channels will be utilized to contact customers during a wildfire hazard event:

- RPU's website, social media, and traditional media
- Phone messages, texts, and e-mail
- Direct contact through neighborhood visits and door hangers when
    - The event is localized on a single circuit
    - For customers signed up for RPU's Utilicare rate that may be impacted and have identified their dependence on medical care devices

Website, Social Media, and Traditional Media: In all cases, information about the event, including red flag warnings issued by the National Weather Service and the potential for a power shutoff, are provided on the RPU website and through social media postings. Public notices are sent out before the start of the event and throughout the event to ensure that customers have current and accurate information as it relates to the City of Riverside. The website also includes how customers can prepare for potential power shutoffs and information on what to expect. Social media posts throughout a wildfire hazard event and the potential for a power shutoff provide updates on the status of the event and helpful tips for customers to use to prepare for potential power outages. The same messages are posted on RPU's Facebook and Instagram accounts and announced on its Twitter feed. Other social media avenues may be used.

Public information staff will coordinate traditional news media communications such as press releases to provide customers with up-to-date information when appropriate, such as if RPU expects to shut off power.

Phone Messages, Texts, and E-mail: In a hazardous event when a power outage is expected or occurring, RPU will also utilize event specific messaging to customers through e-mails or texts. Customers can provide the information and allow RPU to contact them when establishing or updating their utility accounts. Additionally, customers and others in their households can sign up for the City of Riverside's *RiversideAlert* to receive notifications about potential outages. The *RiversideAlert* system allows individuals besides the RPU account holder to be notified in the event of an outage.

A recorded message will be sent to customers or individuals signed up to *RiversideAlert* when there are anticipated outages on either individual circuit or in the event of rolling blackouts. The message will include event information and direction to RPU's website for up-to-date information.

Direct Contact with Customers: If specific circuits are targeted for a potential power shutoff, affected customers will be notified by RPU customer service or programs and services staff by phone, text, or e-mail. If the customer cannot be reached, RPU staff will go to the customer's home or business in an attempt to reach them directly. Door hangers will be left on customer's homes or businesses if time is available.

Special Consideration for At-Risk Communities: Urbanized areas are adjacent to elevated fire risk districts. These urbanized areas include residential single-family housing, apartments, medical services, retail shopping and restaurants, schools, industrial zones, mixed-zones, and parks. Within these urban uses are critical care customers, customers with minimal access to the internet or other communication, and medical and other critical facilities for emergency response. RPU maintains a database of all critical care customers, individuals who rely on life supporting machines and will confirm they have assistance in case of an emergency. RPU's Utilicare customers who have medical devices or other care dependent on electricity will also be directly contacted, either by phone or in-person (if RPU is unable to reach them by phone).

RPU also works closely with the City's emergency responders to ensure that there is communication within our communities in the event of a wildfire or loss of power. In river-bottoms and other undeveloped areas, scattered homeless must be evacuated during a wildfire or similar emergency.

C. KEY STAKEHOLDER AND PARTNER AGENCY NOTIFICATIONS

In wildfire hazard events, RPU must also notify key stakeholders and partner agencies because power outages directly impact the activities and services they provide. RPU maintains regular working relationships with these entities at both staff and executive levels as part of its regular working coordination and customer service. RPU will utilize these relationships in the notification process.

RPUs programs and services representatives will notify key customers of the event information and provide direct access to information related to an immediate event. Key customers include:

- Health care facilities, including but not limited to hospitals, assisted living, nursing homes, and senior care facilities
- Universities and school districts
- Large industrial and commercial customers

RPU's communications staff and public information staff will coordinate communication to the City Council, Board of Public Utilities, media, state and federal elected officials, and representatives of regional, state, and federal agencies that may be impacted by the wildfire hazard event. These agencies will be kept apprised of an event and RPU's actions related to the event.

RPU's staff, including executive management, communications staff, and public information staff, will coordinate with partner agencies (Including airport, water, and telecommunications utilities/companies) and first responders via various channels as deemed appropriate for the event.

D. COMMUNITY OUTREACH AND PUBLIC AWARENESS

RPU recognizes that it is vital to increase public awareness of wildfire risk, how a customer can prepare for wildfire and outages, and how RPU addresses the potential for its facilities and equipment to cause a wildfire. As noted above, a website has been created that provides information about RPU's efforts to prevent wildfires and how electric equipment can cause wildfires.

As a department of the City of Riverside, RPU also has the opportunity to work closely with the City's emergency response team. In particular, RPU and the Riverside Fire Departments take a proactive role in community outreach and public awareness, especially for fire and wildfire awareness. Information on wildfire hazard events and the potential for power outages is being incorporated into appropriate emergency preparedness materials provided by the City and Fire Department.

Brochures, lectures, videos, and other interactive media are readily available on the Riverside Fire Department's website. Community outreach programs are coordinated by the Fire Department and include information from RPU: Purple Ribbon Month, Fire Expo/Open House, Learn Not to Burn, File for Life, Fire Station Tours, School Visits, Water Safety Awareness, Emergency Preparedness, and Career Fairs. The Riverside Fire Department's Public Education Coordinator serves as a liaison between schools, businesses, and other organizations to provide information regarding fire and life safety topics and regularly coordinates with RPU.

SECTION VI. MONITORING THE PLAN AND METRICS

A. METRICS AND ASSUMPTIONS FOR MEASURING THE PLAN PERFORMANCE

RPU's performance metrics are focused on the success of fire prevention strategies at lowering the risk of catastrophic wildfires. The metrics process would evaluate the effectiveness of a fire prevention strategy in reducing the risk of wildfire ignition and spread. This performance metric tracking approach will utilize a format that offers the ability to track compliance trends over time, correct issues as they occur, and adapt metrics as conditions mandate. RPU personnel will measure these metrics at timeframes indicated and as needed to ensure adequate goal achievement tracking.

As with this WMP, overall performance metrics will be managed according to an adaptive management approach, which will facilitate changes in the measures and metric goals and the measurement timeframes, if determined necessary. However, RPU recognizes that there may be unforeseen circumstances that result in the inability to meet a specific metric goal for a given timeframe. This does not necessarily indicate a failure in the process that requires immediate action. The overall metric goal achievement trend will be the focus of this performance measurement process, with a primary focus on maintaining upward trending performance.

Table 9: Metrics to Measure Plan Performance

Category	Metric	Responsibility	Frequen
Equipment Failure	• Number of wire down events caused by conductor failure in Tier 2/3 HFTD • Number of pole failures in Tier 2/3 HFTD • Number of transformer failures in the Tier 2/3 HFTD	Grid Management	Annually
Conventional Fuse Operations	• Number of conventional transformer fuse operation events in Tier 2/3 HFTD • Number of conventional lateral fuse operation events in Tier 2/3 HFTD	Grid Management	Annually
Wire Contact with Foreign Object(s)	• Number of outage events caused by wire contact with an animal • Number of outage events caused by wire contact with mylar balloons • Number of pole failures caused by vehicle contact in the Tier 2/3 HFTD	Grid Management	Annually

Category	Metric	Responsibility	Frequen
Wire Contact with Vegetation	• Number of outage events caused by wire contact with vegetation	Grid Management	Annually
Inspection and Maintenance	• 100% of vegetation management inspections in the Tier 2/3 HFTD completed on time	Grid Management	Annually
Operations	• Number of outages on circuits in Tier 2/3 HFTD • Number of outages on circuits in Tier 2/3HFTD during RFW days • Number of ignitions caused by RPU electrical infrastructure in Tier 2/3 HFTD	Electric Operations Manager	Annually
Extreme Weather Conditions	• Number of RFW days • Number of times automatic reclosing was defeated on Tier 2/3 HFTD • Number of outages during Wind or High Wind Event • Number of outages during High Heat event	Grid Management	Annually
Fire History Events	• Number of events recorded with fire reference (e.g., pole fire, equipment fire) • Downward trend of the number of fire events	RPU Outage Database	Annually

B. IMPACT OF METRICS ON THE PLAN

A discussion of how the application of previously identified metrics to previous plan performance has informed the plan is required by SB-901. In the initial years of this plan, RPU anticipates that there will be relatively limited data gathered through these metrics. However, as the data collection history becomes more robust, RPU will be able to identify areas of its operations and service territory that are disproportionately impacted. RPU will then evaluate potential improvements to the plan.

C. MONITORING AND AUDITING OF THE PLAN

This Wildfire Mitigation Plan will be presented to the City Council for initial approval and comprehensively updated every three years. RPU will present this plan to the Board of Public Utilities on an annual basis. As well as submitting the plan to RPU's Board, the WMP

must also be presented to the Wildfire Safety Advisory Board by July 1st of each year. Comprehensive updates will be completed every three years.

A qualified independent evaluator will provide a report on this plan to the Board of Public Utilities in late 2021 or early 2022. RPU will update the plan with any recommendations from the Independent Evaluator's report and the annual Wildfire Board review in 2023.

Currently, data gathered on the metrics of this plan is limited. As the data collection becomes more and more extensive, RPU will be able to identify areas of its operation and service territory that are disproportionately impacted. RPU will monitor and evaluate data for potential improvements to the plan. RPU Executive Staff is responsible for ensuring risks are continuously monitored and the Wildfire Mitigation Plan is adhered to by all involved personnel.

Monitoring the Effectiveness of Inspections

RPU field operations will conduct inspections periodically and when warranted. Line clearance contractors have their vegetation maintenance inspected by the inspectors. Follow-up review is completed by RPU troubleshooters. The process goes as follows: a detailed inspection is done by a contractor, which in turn is verified by the RPU inspector and Contract Administration on a sample basis. Each RPU crew's work is inspected by a supervisor and verified by the superintendent. Using Root Cause Analysis, Corrective Action Reports are written when deficiencies in the inspections are witnessed.

D. INDEPENDENT EVALUATOR

Public Utilities Code Section 8387 requires RPU to contract a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and evaluate the comprehensiveness of this Wildfire Mitigation Plan. The Independent evaluator must issue a report that is posted to RPU's website. This report must also be presented to the RPU Board or City Council at a public meeting.

An Independent Evaluator will be selected by RPU and the City of Riverside in 2022 based on who is the best qualified, using a selection matrix and weighted factors such as cost.

E. PLAN ADOPTION AND PUBLIC REVIEW

Annually, the Board and Executive Staff will review the plan and update it if any subsequent laws are passed that require additional fire prevention/mitigation measures. The plan and any reports from the Independent Evaluator will be presented during a public meeting providing the community the opportunity to review and comment on the plan. Community members may also comment on the plan to staff using the email address on the website. RPU's WMP and Independent Evaluator Report (when available) will be posted on the RPU website at: https://www.riversideca.gov/utilities/about-rpu/safety-power-shutoff.asp.

F. IDENTIFYING AND CORRECTING DEFICIENCIES IN THE PLAN

Staying up to date with the latest regulatory requirements while monitoring historical data associated with the wildfire mitigation plan is essential for correcting deficiencies in the plan. The Board examines staff progress made on the risk mitigation process, deliberates the action being planned or considered, and determines if it is appropriate to correct any aspects of the plan.

Ultimately, in consultation with independent evaluators and RPU staff, the Board of Public Utilities shall identify and correct any potential deficiencies discovered in this Wildfire Mitigation Plan. RPU will also incorporate any recommendations made by the State's Wildfire Safety Advisory Board after each annual review.

SECTION VII. CALENDAR YEAR 2021: WMP PERFORMANCE SUMMARY

The following section provides a summary of WMP activities completed for 2021. Importantly, RPU infrastructure did cause one wildfires which is described in the metrics section below. Additionally, RPU implemented several preventative strategies and tracked outage data.

A. PREVENTATIVE STRATEGIES IMPLEMENTED

RPU implemented several preventative strategies to improve the systems safety in HFTD as well as the rest of the City. Preventative strategies have primarily focused on improvements in situational awareness and operational practices. Several grid management enhancements have been implemented:

1. **Ongoing:** Electric Operations continues its update of older substation automation systems to migrate to a new real time automation controller infrastructure.

2. **Ongoing:** RPU did not install any new weather stations but develop processes to utilities the three weather stations installed in 2020 at Harvey Lynn, Springs, and RERC Substations. The data from these newly installed weather stations provides real-time weather information to the system operators. Soon, staff will be able to use temperature, wind speed, and relative humidity data to block circuit breakers from reclosing on various feeders at our substations (which is a key fire risk mitigation strategy).

3. **Ongoing:** In 2020, three cameras were installed at Box Springs Mountain Radio Site and City Hall for added visibility. The cameras provide dispatchers with real-time video of the greater Riverside area, paying special attention to wildfire prone regions. No new cameras were installed in 2021.

4. **Ongoing:** Electric Operations created a video network so that these video streams can be integrated with the Land-Mobile Radio dispatch consoles in the Grid Control Center located at the Utilities Operation Center in 2020. In 2021, Operations and the Grid Control Center utilized these new systems.

5. **Ongoing:** RPU continues collaboration and partnership with Riverside Fire Department before, during, and after all wildfire events. This includes completing several river bottom inspections and extensive mitigation efforts in the area, like clearing of overgrown vegetation near electric distribution facilities.

6. ***New for 2021:** In addition to the existing inspections of overhead lines, Electric Operations is working with the Police Department's Aviation to complete enhanced infrared inspections of power lines in the high fire threat areas.

7. ***New for 2021:** Electric Operations began an update of the Standard Operational Practices for wildfire operations procedures and procedures for high fire hazard areas.

B. METRICS AND DATA ANALYTICS

Data analytics is also an important preventative strategy as it will help RPU identify equipment or situations that represent a higher risk of electrical equipment causing a wildfire. With the information, RPU can then determine if preventative strategies should be implemented. Power outage data is reviewed regularly.

RPU is working on refining this data to ensure that it clearly identifies if the outage occurred on equipment in the HFTD. While this refinement to the data tracking is not yet completed, it is a strategy that is anticipated to be completed during the current fiscal year. For 2021, system-wide metrics are reported and are not reflective of outage incidents associated only with HFTDs.

Table 10: Metrics by Calendar Year

Risk Factor	Metric	2020	2021
Equipment Failure	• Number of wire down events caused by conductor failure	4	7
	• Number of pole failures	191	70
	• Number of transformer failures	98	39
Conventional Fuse Operations	• Number of conventional transformer fuse operation events	1	4
	• Number of conventional lateral fuse operation events	18	16
Wire Contact with Foreign Object(s)	• Number of outage events caused by wire contact with an animal	16	14
	• Number of outage events caused by wire contact with mylar balloons	27	13
	• Number of pole failures caused by vehicle contact	27	15
Wire Contact with Vegetation	• Number of outage events caused by wire contact with vegetation (system-wide)	49	25
	o Contact with a tree other than a palm frond	29	11
	o Contact with a palm frond	20	14
Inspection and Maintenance	• Circuit patrols completed on time (COVID-19 staffing restrictions impacted inspection schedules)	49%	66%
Operations	• Number of outages on circuits	640	530
	• Number of outages on circuits during RFW days	**	8
	• Number of Red Flag Warning days	7	3
	• Number of times automatic reclosing was defeated	**	0

Risk Factor	Metric	2020	2021
Extreme Weather Conditions	• Number of outages during Wind or High Wind Event	74	50
	• Number of outages during High Heat event	93	29
Fire History Events	• Number of events with fire reference (e.g., pole fire, equipment fire)	**	3
	• **Number of wildfires caused by RPU electrical equipment**	0	0
	• **Number of ignitions caused by RPU electrical infrastructure**	0	1

** Tracking systems were being developed in 2020 for the identified items.

Wildfire Ignition due to RPU Electrical Infrastructure

On Thursday, July 1, 2021 at 11:24 a.m., the City of Riverside Fire Department responded to a first alarm vegetation fire assignment at the Tequesquite Park Extension located at the Rubidoux Avenue crossing of the Santa Ana River Trail. Firefighters arrived to discover a 1/8 of an acre vegetation fire under an RPU power pole. The fire was extinguished. The Fire Department determined that there were no homeless camps in the area and no signs of ignition devices. Additionally, there were no witnesses to the fire start. The fire cause was undetermined after their investigation.

After further investigation conducted by RPU Electric Field personnel, failure of the overhead pole switch was determined to be the cause of the fire. Electric Field Crews replaced the switch and crossarm on the electric pole. The crews also completed a thorough inspection of the electric utility pole line up and down stream from the ignition point. No additional equipment was replaced nor determined to present a fire threat hazard.

An Incident Information Fact Sheet can be found at the following City website: https://riversideca.gov/fire/incident/rubidoux-incident

SECTION VIII. REFERENCES

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Appendix A

The City of Riverside Fire Department concurs with the Riverside Public Utilities Wildfire Mitigation Plan.