



Wildfire Mitigation Plan Independent Evaluation

Prepared for:

Sacramento Municipal Utility District



Submitted by:

Navigant Consulting, Inc.
35 Iron Point Circle
Suite #225
Folsom, CA 95630

916.631.3262

navigant.com

Reference No.: 209757
September 3, 2019

TABLE OF CONTENTS

Executive Summary 1

1. Background 2

 1.1 SB 901 – Wildfire Mitigation Plans 2

 1.1.1 AB 1054 Statutory Modifications 3

 1.2 Sacramento Municipal Utility District Plan Preparation 3

 1.2.1 Independent Evaluation Services 3

 1.3 Independent Evaluation Qualifications 4

2. Evaluation Scope & Approach 5

 2.1 Evaluation Parameters 5

 2.1.1 Provisional Requirements 5

 2.1.2 Industry Knowledge and Regulatory Proceedings 7

 2.2 Evaluation Approach 7

 2.2.1 Statutory Compliance 7

 2.2.2 Industry Wildfire Mitigation Practices Comparison 7

 2.2.3 Value Determination of Plan Metrics 9

 2.2.4 Data Requests & Facilities Tour 9

3. SMUD WMP Plan Elements 11

 3.1 Objectives and Overview of Preventative Strategies and Programs 11

 3.1.1 Risk Assessment & Drivers 11

 3.1.2 Asset Overview & Service Territory 12

 3.1.3 Wildfire Prevention Strategies 12

 3.1.4 Response & Restoration 15

 3.1.5 Metrics & Plan Monitoring 16

4. Industry Practices Comparison 19

 4.1 Mitigation Strategies Assessment 20

5. Metrics Evaluation 25

 5.1 Assessment of Metrics 25

6. Results & Discussion 26

Appendix A. Statutory Compliance Matrix 27

Appendix B. Industry Practice Strategy Comparison Matrix 35

LIST OF TABLES AND FIGURES

Table 1: POU Requirements for the WMP.....6
 Table 2: Powerline Asset Distribution.....12
 Table 3: SMUD Transmission Inspection Practice.....14
 Table 4: SMUD Distribution Inspection Program14
 Table 5: SMUD Proposed Metrics.....16
 Table 6: Programmatic Targets.....17
 Table 7: Monitoring and Auditing for Select Programs.....17
 Table 8: Industry Practice Comparison Matrix.....20
 Table 9: SMUD WMP Metrics (2019)25

Figure 1: Fire Triangle2
 Figure 2: Contributing Factors to Evaluate the Plan.....5
 Figure 3: Mitigation Strategy Overview.....8
 Figure 4: Determinations for Benchmarking20

DISCLAIMER

This report was prepared by Navigant Consulting, Inc. (Navigant) for the Sacramento Municipal Utility District. The work presented in this report represents Navigant's professional judgment based on the information available at the time this report was prepared. Navigant is not responsible for the reader's use of, or reliance upon, the report, nor any decisions based on the report. NAVIGANT MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESSED OR IMPLIED. Readers of the report are advised that they assume all liabilities incurred by them, or third parties, as a result of their reliance on the report, or the data, information, findings and opinions contained in the report.

EXECUTIVE SUMMARY

The Sacramento Municipal Utility District (SMUD) contracted with Navigant Consulting, Inc. (Navigant) to engage in an independent evaluation of its Wildfire Mitigation Plan (Plan or WMP). This independent evaluation report (Report) describes the technical review and evaluation provided by Navigant. Navigant performed this evaluation in August 2019 and completed the Report on September 3, 2019. Navigant's project team reviewed detailed information related to the Plan, conducted a field visit that included SMUD's overhead electric facilities within Tier 2 and Tier 3 of the High Fire Threat District (HFTD), and assessed SMUD's procedures related to the Plan.

The Plan was prepared as a response to Senate Bill (SB) 901, which was signed into law on September 21, 2018. SB 901 resulted in a number of provisions and directives, among which includes the requirement for electric utilities to prepare and adopt Plans within 2019 and revise and update the Plan annually thereafter. Additional statutory requirements are listed in Public Utilities Code (PUC) Sections 8386 and 8387 each addressing investor-owned and publicly-owned utilities (POUs), respectively.

Navigant evaluated the Plan based on the statutory requirements of PUC Section 8387 as it relates to POUs. This PUC Section was amended on July 12, 2019 as a result of California's Assembly Bill (AB) 1054 being signed into law. The POUs are now subject to the guidance provided by the California Wildfire Safety Advisory Board¹ and mandatory cyclical reviews. The required elements for a WMP have not been modified by this new legislation. This Report meets SMUD's requirements under PUC Section 8387(c), which mandate an independent evaluation of SMUD's Plan. The Report was developed to satisfy the statutory requirement for public review. This Report underlies the required evaluation by the Board of Directors at a public meeting, scheduled for October 17, 2019. The Report includes the following:

- Background of the legislative history requiring WMPs and their independent evaluations
- Approach and methodology evaluating the Plan's comprehensiveness
- SMUD's Plan elements and levelized comparisons to identified industry practices
- An evaluation of the Plan's presented metrics to assess the effectiveness of the overall Plan
- Compliance with SB 901 WMP elements and directives
- Determinations and results

Based on relevant experience in grid hardening and resiliency, natural disaster response, prior experience in WMP development, and active tracking of wildfire legislative and regulatory proceedings Navigant has concluded that SMUD's WMP is comprehensive.

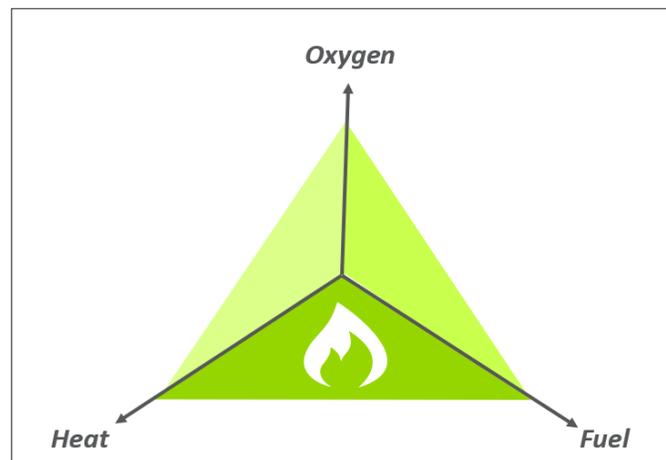
¹ Due for implementation in 2020.

1. BACKGROUND

In recent years, the state of California has seen an increase of utility equipment-involved, catastrophic wildfires resulting in a collaborative push to ensure safe operations of electric utility equipment and deepened investments in wildfire mitigation efforts. This concern, however, is not only on the shoulders of the electric utilities. The state has also demonstrated ongoing activities including conducting thought leadership workshops resulting in legislation that supports customer catastrophe recovery and strengthens governmental and regulatory oversight of prevention implementation activities, utility Wildfire Mitigation Plans (WMPs or Plans), and proper dispersal of state funds to wildfire victims.

The unique geographic profile of California, impacts of climate change, including continued dry conditions, high winds, and elevated heat index risk from global rising temperatures have led to elongated fire seasons. Emerging from a seven-year drought, the state is now experiencing increased levels of vegetation fuel due to subsequent wet winters and hotter summers. This increasingly abundant dry vegetation is the leading driver of wildfire. The levels of dry vegetation fuel have been supplemented by a destructive bark beetle infestation that continues to impact the health of the state’s forested areas, further increasing fire risk. These fuel-rich environments, intensified climatological conditions with high wind gusts, and natural electrical infrastructure risks together produce the conditions conducive to potential wildfire ignition. The three attributes that provide optimal conditions for a fire ignition are illustrated through the graphic in Figure 1.

Figure 1: Fire Triangle



Disastrous wildfire threat is a well-known and shared priority among electric utilities. California has historically experienced fire incidents due to a variety of factors with a recent spike in utility-involved incidents since the 2015 wildfire season.² The resulting cost of a spark igniting a fire due to electrical equipment has demonstrated grave financial and livelihood impacts. In an effort to minimize future devastating occurrences through risk-driven wildfire prevention, electric utilities, including cooperatives, were mandated, by Senate Bill (SB) 901 (Senator Bill Dodd, 2018), to prepare and annually adopt a WMP before January 1, 2020. This effort is foundational to the state’s prioritized goals in minimizing the potential of devastating fires in future years.

1.1 SB 901 – Wildfire Mitigation Plans

On September 21, 2018, Governor Jerry Brown signed SB 901 into law. The bill directed electrical utilities to annually prepare WMPs that include several mitigation and response elements in each utility’s

² California Public Utilities Commission, 2019. “Fire Incident Data Reports for Investor-Owned Utilities,” <https://www.cpuc.ca.gov/fireincidentsdata/>.

strategies, protocols, and programs. Each electric utility is to prepare and adopt a comprehensive WMP before January 1, 2020. The utility requirements are presented in Public Utilities Code (PUC) Sections 8386 and 8387, addressing investor-owned utilities (IOUs) and publicly-owned utilities (POUs), respectively. Details relating to POU requirements are discussed in Section 2 of this evaluation report (Report).

1.1.1 AB 1054 Statutory Modifications

On July 12, 2019, Governor Gavin Newsom signed Assembly Bill (AB) 1054 into law. This bill was developed with the consideration of the Governor's Strike Force effort to develop prioritized strategies to help the state achieve its decarbonization goals. AB 1054 aims to mitigate the intensity of wildfire impacts through several initiatives that are separate from those actions required of electric utilities. SB 901 directed the Office of Planning and Research to establish a Commission on Catastrophic Wildfire Cost Recovery (SB 901 Commission) with the goal of addressing utility wildfire liability, cost responsibility and victim support, and issues with insurance availability and affordability. On June 18, 2019, the SB 901 Commission presented to the state Legislature, findings and recommendations on the discovery items discussed at public workshops over the course of several months. This, in part with Governor Newsom's Wildfire Reform Package, resulted in legislation that culminated in the provisions listed in AB 1054.

AB 1054 included directives to establish the Wildfire Safety Division at the California Public Utilities Commission (CPUC) and the state's Wildfire Safety Advisory Board. POUs will provide future WMPs by July 1st of each year starting in 2020 for review by and recommendations from the Wildfire Safety Advisory Board. No less than every three years, POUs are required to comprehensively update their WMPs. This change is included in this evaluation as a reference for future requirements.

1.2 Sacramento Municipal Utility District Plan Preparation

SMUD is a community-owned municipal utility district serving electricity to over 600,000 customers within Sacramento County. SMUD maintains approximately 3,900 miles of overhead (OH) distribution and 470 miles of transmission circuits within its 900-square-mile service territory and within the Upper American River Project (UARP). As a POU, SMUD provides not-for-profit electric service that aims to enhance customers' and the community's quality of life through innovative energy solutions. SMUD actions and decisions are governed by an elected Board of Directors (Board), each of whom represent one of seven Wards, a geographic area within the territory.

SMUD has prepared its first WMP pursuant to SB 901 directives. The Plan aims to address each of the required elements presented by PUC Section 8387, which is applicable only to POUs and electric cooperatives, and ultimately reduces risk exposure to utility-involved wildfire events through Plan execution and metric tracking. SMUD posted its draft Plan in May of 2019 for public review. Comments received have been addressed in the final version of SMUD's WMP. SMUD reserves the ability to modify the Plan until the Board meeting presentation planned for October 2019.

1.2.1 Independent Evaluation Services

PUC Section 8387(c) directs POUs to procure services for an independent evaluation (IE) of the comprehensiveness of the WMP. In January 2020, upon commencement of the California Wildfire Safety Advisory Board, guidelines and further details related to the scope and timelines of future IEs will be discussed and reviewed. The legislation in its present³ form mandates that POUs procure IE services from entities experienced in assessing the safe operations of electrical equipment.

³ The CPUC has just begun its investigation to develop a list of recognized independent evaluators by March of 2021.

SMUD sought out IE services to assess the comprehensiveness of its WMP pursuant to PUC Section 8387(c) prior to presenting the final WMP to the Board. This Report presents the results of Navigant's WMP IE. The following section describes the methodology in executing this evaluation.

1.3 Independent Evaluation Qualifications

The provisions of PUC Section 8387 state that the independent evaluator shall be experienced in “assessing the safe operation of electrical infrastructure” and will perform an assessment to determine the comprehensiveness of the Plan.⁴ Emergent practices will materialize as evolving legislative action continues to shape wildfire mitigation and safety efforts. Understanding this, Navigant performed a comparison of the wildfire mitigation investments exemplified by other utilities throughout California as well as relied on the team's experience in working directly with utilities to develop their WMPs and data collection practices along with prior experience related to grid hardening and electric safety assessments.

SMUD has moved to contract with a qualified independent evaluator within 2019. While the IOUs are not yet subject to this requirement until a later date, several POUs and joint action agencies have opted into contracting for this service prior to the approval and implementation of their first WMP iteration. SMUD contracted Navigant Consulting, Inc. (Navigant) in July of 2019 to undertake an assessment of its Plan based on Navigant's prior experience with grid-hardening and WMPs, with an emphasis on electrical equipment, public, and personnel safety.

Navigant Identification of Qualifications

Navigant has provided IE services throughout the United States. Navigant's grid-related IE projects include storm hardening, wildfire mitigation, resiliency assessments, advanced technology suitability, among others. Our approach includes an evaluation of data considered, suitability of tracking metrics – both frequency and trends analysis - and an evaluation of key performance indicators. Navigant assessed the efficacy of tools for creating sufficient awareness and for effectiveness of understanding overall WMP's intended and actual impacts. Navigant also leveraged experience developing “Metrics and Benefits Reporting Plans” to gauge cost-effectiveness of activities and alignment of plans to intentions. Navigant deeply understands SMUD's community-owned business practices relative to IOUs, though experience from developing WMPs for two IOUs and continued tracking of related CPUC dockets intended to refine strategies that carry an effective Plan.⁵

Navigant has continued to track proceedings and pending legislation surrounding utility wildfire risk. Our team remains active with WMP engagements across all jurisdictions. As part of maintaining high acumen of prudent mitigation strategies, Navigant participates in forums focused on innovative wildfire mitigation strategies—further expanding our industry knowledge. Navigant provides thought leadership and advisory services related to WMP and other resiliency innovative technologies to the California Energy Commission and has supported their system hardening and fire prevention efforts since 2008. Additionally, Navigant's reach into grid resiliency and disaster-related hardening extends across the United States including island grids, such as Puerto Rico, recovering from recent, weather-related catastrophes.

⁴ It is recognized that this requirement does not yet include a clear definition of comprehensiveness.

⁵ Navigant provided technical services to Liberty Utilities (CalPeco Electric) and Bear Valley Electric Service (BVES) immediately prior to and within the 2019 calendar year. The services resulted in support of the development and filing of their respective WMPs to the CPUC on February 6, 2019. Navigant continued to support BVES in development of their Data Collection for WMP report, filed on July 30, 2019. Additionally, one member of the core team supported some aspects of the WMP development for the Transmission Agency of Northern California but has modified this role for removed engagement and established an ethical wall to allow a transparent, prudent evaluation process for SMUD.

2. EVALUATION SCOPE & APPROACH

At the time of this IE, the guidelines and requirements were not available to POUs regarding the structure or determination of comprehensiveness pursuant to PUC Section 8387(c). Navigant undertook this assessment based on industry standard practices, demonstrated global fire mitigation practices, and a leveled gap analysis of those strategies compared to the specific risk drivers and potential exposure to SMUD. This is the first iteration of the Plan. With anticipated updates and future revisions, Navigant primarily addressed the required mitigation areas and procedural approach in implementing the Plan.

2.1 Evaluation Parameters

In accordance with the statutory requirement, this evaluation reached a favorable determination of the comprehensiveness of SMUD’s WMP. Parameters and evaluation areas have not been established by the state or the CPUC for POUs and IOUs, respectively. In lieu of this formalized directive, Navigant’s assessment was formed from relevant experience in grid hardening and reliability, natural disaster response, prior experience in WMP development, and active tracking of wildfire legislative and regulatory proceedings. Figure 2 represents the attributes comprising the methodology and approach of the evaluation.

Figure 2: Contributing Factors to Evaluate the Plan



2.1.1 Provisional Requirements

The requirement for electric utilities and corporations to develop WMPs emerged from the directives of SB 901 and associated statutory modifications. With respect to POUs, the nested subsections under PUC Section 8387(b)(2) outline the required elements to be included in the Plan. See Table 1 for the complete statutory compliance list.

Table 1: POU Requirements for the WMP

PUC Section 8387 <i>(as amended on July 12, 2019)</i>
<p>(a) Each local publicly owned electric utility and electrical cooperative shall construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of wildfire posed by those electrical lines and equipment.</p>
<p>(b) (1) The local publicly owned electric utility or electrical cooperative shall, before January 1, 2020, prepare a wildfire mitigation plan. After January 1, 2020, a local publicly owned electric utility or electrical cooperative shall prepare a wildfire mitigation plan annually and shall submit the plan to the California Wildfire Safety Advisory Board on or before July 1 of that calendar year. Each local publicly owned electric utility and electrical cooperative shall update its plan annually and submit the update to the California Wildfire Safety Advisory Board by July 1 of each year. At least once every three years, the submission shall be a comprehensive revision of the plan.</p>
<p>(2) The wildfire mitigation plan shall consider as necessary, at minimum, all of the following:</p>
<p>(A) An accounting of the responsibilities of persons responsible for executing the plan.</p>
<p>(B) The objectives of the wildfire mitigation plan.</p>
<p>(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.</p>
<p>(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.</p>
<p>(E) A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.</p>
<p>(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.</p>
<p>(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.</p>
<p>(H) Plans for vegetation management.</p>
<p>(I) Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.</p>
<p>(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:</p>
<p>(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.</p>
<p>(ii) Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the local publicly owned electric utility's or electrical cooperative's service territory.</p>
<p>(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.</p>
<p>(L) A methodology for identifying and presenting enterprise wide safety risk and wildfire-related risk.</p>
<p>(M) A statement of how the local publicly owned electric utility or electrical cooperative will restore service after a wildfire.</p>

(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.

(3) The local publicly owned electric utility or electrical cooperative shall, on or before January 1, 2020, and not less than annually thereafter, present its wildfire mitigation plan in an appropriately noticed public meeting. The local publicly owned electric utility or electrical cooperative shall accept comments on its wildfire mitigation plan from the public, other local and state agencies, and interested parties, and shall verify that the wildfire mitigation plan complies with all applicable rules, regulations, and standards, as appropriate.

(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 website 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.

2.1.2 Industry Knowledge and Regulatory Proceedings

The state's priority towards abating future catastrophic wildfire events has been demonstrated through aggressive measures, directing utilities to enhance their protocols for fire prevention and response. That collection of information is presented in a comprehensive WMP. While POUs are directed to develop this Plan prior to January 1, 2020, Navigant recognizes that California utilities subject to CPUC jurisdiction have filed their respective Plans on February 6, 2019. Navigant has tracked docketed proceedings and maintains a presence in state activities and workshops surrounding wildfire prevention. Understanding that SMUD is not subject to CPUC regulations, the insight gained from this related experience is leveraged in assessing SMUD's Plan relative to its risk profile and industry position.

2.2 Evaluation Approach

To perform an assessment of the comprehensiveness of the Plan, Navigant used the following described approach.

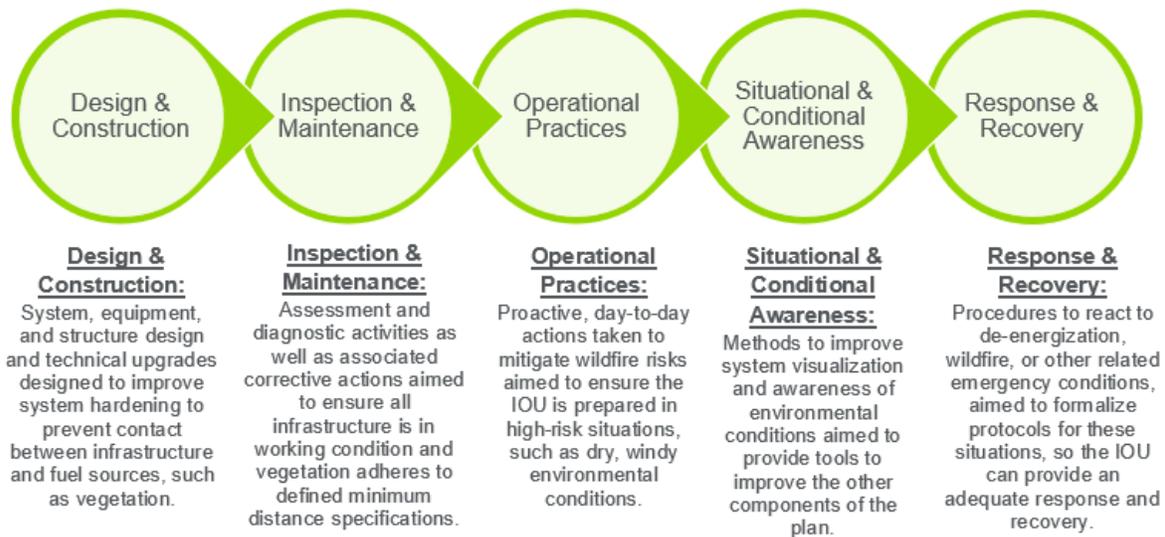
2.2.1 Statutory Compliance

Navigant sought to determine compliance with the provisional requirements laid out in PUC Section 8387 as modified by SB 901. The Plan's alignment with the statutory requirement is presented in Appendix A. The evaluation of the Plan's elements associated with the IOU's common framework facilitated the assessment of the Plan's comprehensiveness. SMUD's mitigation measures are not required to exceed the statutory requirements. The IE process revealed an understanding of SMUD's WMP relative to other utilities and as compared to industry standards and practices.

2.2.2 Industry Wildfire Mitigation Practices Comparison

Accepted practices for wildfire mitigation have been discussed and presented at thought leadership events, such as the Wildfire Technology Innovation Summit, held on March 20-21, 2019. Additionally, Plans approved by the CPUC have garnered significant insight from the industry at large. Navigant's understanding of an effective Plan draws on comparisons from existing WMPs and industry practices and is summarized according to business practice categories described in Figure 3.

Figure 3: Mitigation Strategy Overview



Expertise in these critical elements facilitated Navigant’s review of the comprehensiveness of SMUD’s WMP. While not all of these strategies are present in or applicable to SMUD’s Plan, Navigant’s understanding of collected utility strategies demonstrated throughout the state are summarized below:

- **Inspection and maintenance of distribution transmission and substation assets** including conducting system patrols and ground inspections, using technological inspection tools, managing predictive and electrical preventative maintenance, and conducting vegetation inspections and management, vulnerability detection such as Light Detection and Ranging (LiDAR) inspection; and geospatial and topography identification, geographic information system (GIS) mapping data. A key component is identifying collected data elements through each program and understand how that data is used and shared to improve utility practices.
- **Vegetation management** that includes routine preventative vegetation maintenance; corrective vegetation management and off-cycle tree work; emergency vegetation clearance, prioritized for portions of the service territory the lie in high hazard zones, quality control processes; and resource protection plan, including animal and avian mitigation programs.
- **System hardening** that includes pole replacement, non-expulsion equipment, advanced fuses, tree attachment removal, less flammable transformer oil, covered wire and wire wrap, and undergrounding where cost beneficial.
- **Operational practices** including communications and mustering plans under varying degrees of wildfire risk. Plans to deactivate automatic reclosers, de-energization of “at risk” area powerlines based on type of facility (overhead bare conduction, high voltage, etc.), tree and vegetation density, available dry fuel, and other factors that make certain locations vulnerable to wildfire risk.
- **Situational awareness** including obtaining information from devices and sensors on actual system, weather and other wildfire conductivity conditions, two-way communication with agencies and key personnel. Programs such as online feeds and websites such as the National Fire Danger Rating System. Situational awareness should help achieve a shared understanding of actual conditions and serve to improve collaborative planning and decision making.
- **De-Energization actions** that are triggered and prioritized by forecasted extreme fire weather conditions; imminent extreme fire weather conditions; validated extreme fire weather conditions; and plans for re-energization when weather subsides to safe levels. Manual or automatic capabilities exist for implementation.

- **Advanced Technologies** including Distribution Fault Anticipation technology, tree growth regulators, pulse control fault interrupters, oblique and hyper-spectral imagery; advanced transformer fluids; advanced LiDAR, and advanced SCADA, to reduce electrical ignition while also helping to mitigate power outages and equipment damage.
- **Emergency Preparedness, Outreach and Response communications** before, during, and after emergencies including but not limited to engaging with key stakeholders that include critical facilities and served customers; local governments, critical agencies such as California Department of Forestry and Fire Protection (CAL FIRE), local law enforcement agencies and other first responders, hospitals, local emergency planning committees, other utility providers, California Independent System Operator, and the utility's respective Board. Coordination agreements such as Mutual Assistance should be leveraged. Community outreach plan should inform and engage first responders, local leaders, land managers, business owners and others.
- **Customer support programs** including financial assistance and support for low-income customers; billing adjustments; deposit waivers; extended payment plans; suspension of disconnection and non-payment fees; repair processing and timing; access to utility representatives; and access to outage reporting and emergency communications. Consideration of languages in addition to English. Identification of priority customers, such as first responders and local agencies, health care providers, water and telecommunication facilities, groups that assist children, elderly, mobility impaired, and other vulnerable populations.

2.2.3 Value Determination of Plan Metrics

Metrics for tracking the Plan's progress intend to allow the utility to refresh information as trends become clearer. Based upon the discussion included in the CPUC's Phase 2 of the SB 901 proceeding docket, interests in metric development and underlying data collection are beginning to take shape. While these determinations do not directly influence the public power sector, insight has been leveraged to employ effective metrics.⁶

2.2.4 Data Requests & Facilities Tour

Navigant submitted requests for additional data throughout the IE. This information supported an understanding of the procedures and details behind the mitigation measures. The items supportive of this evaluation included distribution and transmission powerlines within the HFTDs, auto-reclosing settings and recloser protocols, non-expulsion fuse device replacements for traditional fuses, and detailed understanding of proposed metrics and Plan accountability. The data received, in part with the Plan's elements, facilitated the determination of the Plan's comprehensiveness, later described in Section 6.

Field Visit

On August 27, 2019, SMUD conducted a field tour with their technical and vegetation management staff. Additional practices for managing the right-of-way (ROW) and clearance areas were discussed with examples of the work typically performed. The facilities and electrical equipment viewed included:

- 4 kilovolt (kV) powerline
- 60 kV sub-transmission powerline
- Adjacent substation
- 230 kV transmission powerline

⁶ CPUC Order Instituting Rulemaking to Implement Electric Utility Wildfire Mitigation Plans Pursuant to SB 901 (2018) (Rulemaking 18-10-007) https://apps.cpuc.ca.gov/apex/f?p=401:56:0::NO:RP,57,RIR:P5_PROCEEDING_SELECT:R1810007.

Photos taken of subject electrical equipment within the HFRD area field visit are represented below.



60kV wood pole design with 4kV attachment



Adjacent substation origin of illustrated powerlines



60kV wood pole design with 4kV riser pole for undergrounded segment of the line

3. SMUD WMP PLAN ELEMENTS

Navigant reviewed the Plan elements and determined whether the activities supported the intention to deploy an effective WMP. This determination incorporated individual elements as well as underlying data sources that further described data collection methodologies and implementation procedures to ensure measures are carried out and also tracked. This understanding also informs internal reviews and subsequent updates for future Plan iterations.

Navigant found that SMUD’s WMP satisfied the statutory requirements of PUC Section 8387. In this section we will review the WMP’s elements and their purpose relative to the development and successful execution of the WMP. A table comparing each subsection of PUC Section 8387 to the significant sections of the WMP can be found in Appendix A.

3.1 Objectives and Overview of Preventative Strategies and Programs

PUC Section 8387

(B) The objectives of the wildfire mitigation plan.

(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.

3.1.1 Risk Assessment & Drivers

PUC Section 8387

(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 publicly owned electric utility’s or electrical cooperative’s service territory.

(L) A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk.

Section 4 of SMUD’s WMP lays out the risk analysis and risk drivers that guide the development of SMUD’s wildfire prevention practices. The section begins with a review of SMUD’s enterprise-wide risk assessment (ERM) framework. SMUD’s ERM is used throughout the organization to assess risk and response and is strongly supported by governance structures.

The plan also reviews the impact of climate change on wildfire risk. In particular, the necessity for year-round preparedness as the region moves away from an annual wildfire season to continual risk. SMUD utilized an accepted risk assessment strategy that provides an illustrative depiction of risk drivers and associated risk impacts through a Bow-Tie Analysis framework. SMUD consulted with its subject matter experts to complete the analysis which produced a list of key risk drivers and impacts.

3.1.2 Asset Overview & Service Territory

PUC Section 8387

(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.

The WMP lays out the SMUD controls assets in both outside and within the Tier 2 and 3 HFTD areas.⁷ Table 2 summarizes the percentage of OH transmission and distribution lines, and load serving substations in HFTD subject areas.

Table 2: Powerline Asset Distribution

Asset	Outside HFTD	Tier 2	Tier 3
Total OH transmission	72%	18%	11%
Total OH distribution	99.92%	0.05%	0.03%
Total load serving substations	100%	0%	0%

Based on a mutual agreement with Pacific Gas & Electric (PG&E) SMUD serves five non-residential PG&E customers from its UARP facilities, and thirteen PG&E customers in Northern San Joaquin County. None of the customers in Northern San Joaquin County are in Tier 2 or 3 of the HFTD.

3.1.2.1 Upper American River Project

SMUD operates a federally licensed hydroelectric project in El Dorado County known as the UARP. The entirety of SMUD’s assets in Tier 2 and 3 HFTD areas are part of the UARP.

There are transmission structures in the UARP that are not accessible by vehicle. These must be reached on foot during annual inspections. There are also transmission structures that are only accessible with a 4x4 side-by-side (ex: Polaris).

The 3.1 miles of overhead 4kV distribution wires in Tier 2 and Tier 3 areas use bare wire construction.

3.1.3 Wildfire Prevention Strategies

PUC Section 8387

(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.

(H) Plans for vegetation management.

⁷ California Public Utilities Commission, 2019, “Fire Threat Maps,” <https://www.cpuc.ca.gov/firethreatmaps/>.

(i) Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.

3.1.3.1 Disabling Reclosers

While disabling reclosing on substation breakers and pole top reclosers does not fully eliminate ignition events, it reduces the number of potential ignitions (sparks). An ignition can still occur during the initial faulted condition, but disabling the reclosing function reduces the risk of more ignitions after the initial fault occurs. The substation breaker and pole top recloser are critical protective devices used in reducing the risk of ignition. While disabling reclosing on substation breakers and pole top reclosers does not eliminate ignition events, it does reduce the number of potential ignitions.

All of SMUD's 115 kV, 230 kV and UARP 69 kV, 230 kV transmission auto-reclosers are disabled during wildfire season as defined as May 1st to October 1st. In places where the style of reclosers, located within the PCA does not have the ability to disable reclosing, SMUD installs fuses in-line (in-series) with the recloser. These fuses will blow during the initial fault, eliminating an additional ignition condition.

The circuit breakers supplying power in the UARP 4kV area do not have reclosing functionality. These 4kV breakers are being upgraded to provide remote indication (SCADA) capability.

For SCADA-enabled substations and reclosers, reclosing is disabled remotely. For non-SCADA substations and reclosers, reclosing is disabled manually at the controller or relay.

3.1.3.2 De-Energization Protocols

SMUD's Power System Operators (PSOs) have the authority to de-energize portions or all of the Valley and UARP transmission line(s) for safety, reliability, conditions beyond design criteria, threat of wildfires and during emergency conditions when requested by local law enforcement or fire officials.

Distribution System Operations can de-energize SCADA substations by remotely opening the circuit breaker for the respective feeder. For non-SCADA substations, a troubleshooter is sent to open the breaker manually from the substation location.

Section 7.2 of the Plan describes public and agency communications for a potential wildfire through the use of the California Governor's Office of Emergency Services' (Cal OES') Standardized Emergency Management System (SEMS) framework for its "Incident Command Structure."⁸

3.1.3.3 Vegetation Management

Routine maintenance including pruning and removal on time-based intervals of one, two and three-year ground-based field patrols for distribution and transmission assets.

There are 1242 locations in the annual pole clearing program, all within the Pole Clearing Area (PCA). The PCA is a SMUD defined area where poles with non-exempt equipment have annual vegetation clearing and/or pruning within a 10-foot radius in compliance with PRC 4292 prior to the start of fire season, currently May 1st of each year.

⁸ Cal OES, November 2019. "SEMS Guidelines," <https://www.caloes.ca.gov/PlanningPreparednessSite/Documents/12%20SEMS%20Guidelines%20Complete.pdf>.

3.1.3.4 Infrastructure Inspections

Table 3: SMUD Transmission Inspection Practice

Transmission Inspection Program	UARP	Valley
Aerial patrols (helicopter)	Twice a year	Annually
Ground patrols	Annually	Bi-annually
IR inspections (helicopter)	Annually	Bi-annually
Wood pole intrusive inspections	Minimum cycle of 10 years and a maximum cycle of 14 years	
Vegetation ROW maintenance	Annually	1-3 years
Splice assessment program	On-going inspection program	On-going inspection program

Table 4: SMUD Distribution Inspection Program

Distribution Inspection Program	Overhead and pad-mounted equipment	Underground equipment	Substations
Detailed line inspections	Every 5 years	Every 3 years	n/a
Line patrols	Annually	Annually	n/a
69kV and PCA 12kV IR inspections (helicopter)	Bi-annually	Bi-annually	n/a
Wood pole intrusive inspections	Minimum cycle of 10 years and a maximum cycle of 14 years		n/a
Annual pole clearing program	Annually, completed prior to May 15th		n/a
Visual substation inspections	n/a	n/a	10 times per year

3.1.4 Response & Restoration

PUC Section 8387

(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.

(M) A statement of how the local publicly owned electric utility or electrical cooperative will restore service after a wildfire.

3.1.4.1 Prior to Event

- Contact Center, Strategic Account Advisors, Media Services, social media, and smud.org will provide ongoing and available resources for communication and education for the overall customer base
- smud.org/WildfireSafety provides information about SMUD’s efforts on wildfire prevention and management
- Ongoing education communication on how to prepare for emergencies prior to peak fire season
- Public Information Specialists will provide ongoing mass media communication via traditional news media channels and via Facebook and Twitter to provide customers and the community with information about an emergency or potential emergency
- Government Affairs Representatives will reach out to the executive staff of local governments, elected officials, SMUD’s state delegation, federal representatives and appropriate agency staff to provide initial contact and ongoing communications by email and phone with messages for their constituents

3.1.4.2 Event Communication

Public:

- SMUD sends automated pre-recorded phone calls to customers in the impacted areas/neighborhoods advising when the outage is called and direct them to smud.org/outages for up-to-date information
- Contact Center IVR (Interactive Voice Response) will have real-time recorded information informing each group of customers that may be impacted before the rotating outages begin
- SMUD will send customers enrolled in the Medical Equipment Discount Rate program an email or letter each year to remind them of the risk of wildfire danger, to have an emergency back-up plan if an outage occurs and refer them to smud.org/WildfireSafety for more information

3.1.4.3 Essential Stakeholder Engagement and Restoration

SMUD will provide proactive communications to alert key stakeholder and essential and critical customers which are identified in the Plan. Limited details are provided as to what the proactive communications will be or how they may go beyond the public communications protocols referenced above. The

understanding is that similar procedures will take place in a prioritized sequence of events with prioritized communication and notification needs.

Section 8 of the Plan details SMUD’s steps to restore service following de-energization of a transmission or distribution line and additional reconstruction steps that must be taken following destruction of structures during a wildfire event. Customers are notified of restoration of power by the outage communication system.

3.1.5 Metrics & Plan Monitoring

PUC Section 8387

- (A) An accounting of the responsibilities of persons responsible for executing the plan.

- (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.

- I A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.

- (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.

3.1.5.1 Metrics & Programmatic Targets

Table 5: SMUD Proposed Metrics

Specific metric	Indicator	Measure of effectiveness	Bounds
Wire down events caused by SMUD equipment failure	Count of events	No material increase	Fire season (May 1 through October 1)
Ignition events	Count of events	No material increase	

Table 6: Programmatic Targets

Performance / Programmatic Targets	Details	Target
Maintenance Programs	<ul style="list-style-type: none"> • Distribution Line Inspections • Distribution Wood Pole Intrusive Tests • Distribution Annual Line Patrol • Annual Pole Clearing Program • Transmission Structure Patrols • Transmission Aerial Patrols (Helicopter) • Transmission IR Patrols (Helicopter) • 69 kV IR Helicopter Patrols • Pole Clearing Area • Distribution Vegetation Pruning/Clearing • Transmission Vegetation Pruning/Clearing 	≥ 95%
System Enhancement Capital Project	Install non-expulsion devices in PCA	25 – 35% per year (3-year project)

3.1.5.2 Monitoring and Auditing the Plan

Monitoring and auditing of the WMP is supported by existing quality control processes embedded into existing practices as well as formal quality control processes for specific programs as detailed in Table 7.

Table 7: Monitoring and Auditing for Select Programs

Program	Description	Objectives
Distribution system inspections	SMUD's maintenance planning group manages transmission and distribution (T&D) line and substation assets including the development of comprehensive inspection and maintenance programs.	<ul style="list-style-type: none"> • Ensure employee and public safety • Minimize risk of wildfire posed by powerlines and equipment • Maintain regulatory and SMUD policy compliance • Improve the availability and reliability of the system • Employ industry best practices • Extend the useful life of equipment • Minimize the total cost of equipment ownership
Vegetation management (VM)	SMUD's vegetation clearing/pruning activities are performed by contractors. The contractors are quality audited by SMUD VM personnel.	<ul style="list-style-type: none"> • Distribution system related work and contractors are field audited and approximately 7% of the tree work (pruning and removal) is reviewed • For transmission, SMUD VM staff perform a quality control audit of 100% of the transmission system related work performed by the contractor

Internal audit	<p>SMUD's internal audit department, known as Audit and Quality Services (AQS) provides independent, objective assurance and consulting services to the Board of Directors and management designed to add value and improve SMUD's operations.</p>	<ul style="list-style-type: none"> • Adherence to plans, policies and procedures • Compliance with applicable laws and regulations • Effectiveness and application of administrative and financial controls • Effectiveness and efficiency of operations • Reliability of data • Safeguarding assets • Accuracy of the SD monitoring reports
----------------	--	---

3.1.5.3 Annual review

The WMP will be reviewed annually in alignment with SMUD's existing business planning process. The review will include assessments of the WMP's programs and performance.

4. INDUSTRY PRACTICES COMPARISON

In consideration of industry-accepted and demonstrated mitigation measures, Navigant provided a comparison against approved California utility Plans where comparable to SMUD's service territory, risk profile, and equipment within the HFTD Tier 2 and 3 areas. The complete comparison matrix with supporting information is provided in Appendix B. Highlighted strategies for effective wildfire mitigation are represented in Table 8; three items have been recommended for detailed discussion of the applicability and efficacy of the proposed strategy.

Covered Conductors

Covered conductors are any conductors (wires) protected by layers of insulation, so the conductors are protected against inadvertent contacts. These wires are designed to withstand inadvertent contact with vegetation and/or other debris without starting a fire.

Throughout California and in many areas of the country, the use of bare overhead wire has been the standard. Bare wire has demonstrated a high-level of reliability in adverse weather conditions such as lightning conditions.

In higher risk areas (Tier 2 and Tier 3) SMUD is determining an approach to replace the UARP 4kV bare wire with covered conductors. SMUD expects several months to complete engineering, followed by replacement of the bare wire with covered wire in 2020. This is appropriate and consistent with other WMPs within the state.

Disabling Reclosing Operations

Disabling reclosing refers to the ability to turn off the functionality of substation breakers and reclosers to attempt to isolate fault conditions and re-energize (turn back on) areas of the electric grid. Traditionally, electrical circuits were designed to automatically open and close to detect and isolate faults. In many cases, the relays would make two or three attempts to isolate a fault condition. Each potential attempt could cause an electrical spark, which could be a source of ignition. Disabling reclosing significantly reduces the number of potential ignition sources.

SMUD has a program in place to turn off or disable reclosing for all distribution lines and transmission lines for their PCA, Tier 2 and Tier 3 areas. This disabling occurs during its wildfire season, which SMUD determines to be May 1 to October 1 of each year.

For SCADA-enabled substations and reclosers, reclosing is disabled remotely. For non-SCADA substations and reclosers, reclosing is disabled manually at the controller or relay panel. In places where the style of reclosers does not have the ability to disable reclosing, SMUD installs fuses in-line (in-series) with the recloser. These fuses will blow during the initial fault, eliminating an additional ignition condition.

SMUD's approach to disabling reclosing is appropriate and consistent with the practices of other utilities.

Non-Expulsive Fuse Devices

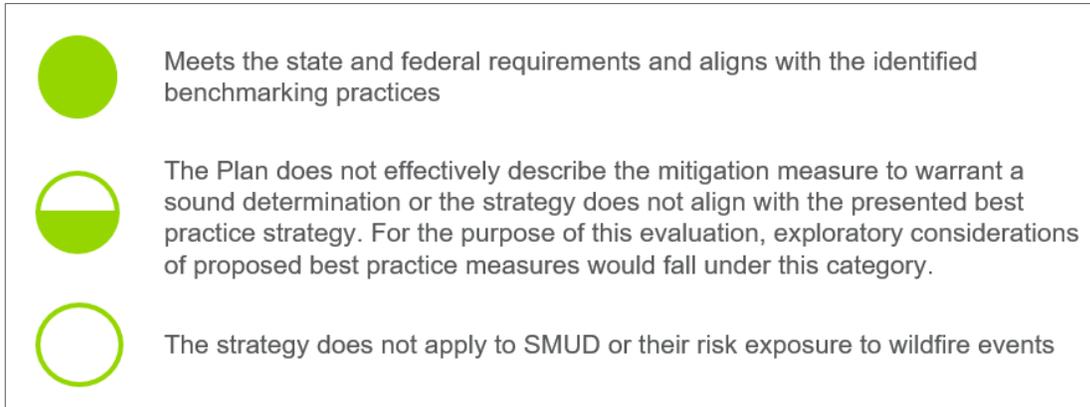
Fuses (Fusing) refer to protective devices that defend the distribution system from faulted or damaged lines and equipment. Historically, SMUD, other utilities in California, and utilities across the country have used conventional fuses to protect powerlines. These conventional fuses, when operated, expel hot particles and gases, which can start fires. In order to mitigate the potential for fire ignitions, SMUD proposes to replace conventional fuses with non-expulsive type fuses.

SMUD plans to replace all expulsive fuses with non-expulsive fuses in the PCA over three years as well as within Tier 2 and 3 over a two-year period starting in 2020. This is consistent with the practices being performed by the other utilities in the state.

4.1 Mitigation Strategies Assessment

The following describes the scoring determinations of the benchmarking practice. Navigant weighed strategies that have been demonstrated globally as well as from those proposed by state utilities. As expressed in Figure 4, this benchmarking practice supports efforts to determine the Plan’s comprehensiveness when investigating the mitigation measures proposed in SMUD’s WMP. This assessment is designed to confirm prudent measures as proposed by SMUD and did not result in any material findings that would result in non-compliance or lack of comprehensive Plan elements.

Figure 4: Determinations for Benchmarking



The selected strategies represented in Table 8 include both statutory requirements that exist as industry standards for POU’s as well as accepted industry practices within the state.

Table 8: Industry Practice Comparison Matrix

Identified Practice Strategy	SMUD Applicability	Determination
Situational Awareness / Weather Conditions		
Investing or investigating in opportunities to procure weather stations for instantaneous weather condition reporting	Especially in High Fire-Threat Districts (HFTDs) weather stations would allow SMUD personnel to have access to real-time monitoring of these areas	 <p>SMUD has adequate coverage of this mitigation measure across its Tier 2 and 3 areas and has included additional weather stations in the HFTD as well as within its service territory, which has less risk exposure</p>

<p>Instantaneous weather conditions web-based portal and GIS data sharing capabilities; weather monitoring</p>	<p>With the added weather stations along with existing ones, SMUD should have the ability to capture and interpret the information sent in real-time for operations that warrant mitigation measures.</p>		<p>Four new weather stations were installed in 2018 within the UARP region to support HFTD situational awareness. The inclusion of additional weather stations compared to the low risk environment of SMUD's service territory and facilities results in a determination of meeting the identified practice strategies.</p>
<p>Cameras with night vision mode capability atop of electrical structures</p>	<p>SMUD has facilities within HFTDs that would benefit from additional visibility into the regions with greatest threat of ignition or fire spread</p>		<p>SMUD will be considering the procurement of pole-top cameras for better visibility as mentioned in Table 2 of the Plan as a pilot project.</p>
<p>System Hardening / Design & Construction</p>			
<p>Replacing bare wires with covered conductors</p>	<p>SMUD has applicable powerlines within HFTDs that would benefit from additional hardening such as covered wire replacement for existing, legacy bare wire</p>		<p>SMUD is performing the engineering analysis to determine the strategy to place bare wire in Tier 2 and Tier 3 areas. Once the strategy is determined, SMUD proposes to begin bare wire replacement in 2020.</p>
<p>New or planned electrical lines (distribution and transmission) that are designed to withstand working loads under the stress above design standards to address high wind speeds</p>	<p>New line construction standards are taken into consideration in accordance with GO95.</p>		<p>As SMUD's develops capital infrastructure plans it assures compliance with GO95</p>
<p>Steel or composite poles swapped out for wood poles, at minimum, within HFTDs or fireproofing wooden poles (fire resistant material coating)</p>	<p>While pole remediation activities exist, such as additional clearing, coring to test structural integrity, and coating mechanisms, when new poles are considered for high fire severity zones, more resilient designs should be a consideration.</p>		<p>The Plan states that steel poles will be considered as replacement activities warrant the activity. This aligns with the identified strategy.</p>

<p>Pole loading assessment and remediation</p>	<p>SMUD must comply with PRC 4292 for pole clearing activities for vegetation risk and should also maintain awareness of the decay and structural integrity of aged or impacted poles within the service territory and UARP region.</p>		<p>SMUD complies with state requirements as well as meets the practice standard for pole loading and remediation. While depicted in Table 2, SMUD should expand the descriptions within the Plan to provide an understanding of these practices.</p>
<p>Expulsion fuse device change out to current-limiting (non-expulsive) fuses</p>	<p>SMUD's PCA and inclusive high fire threat areas would benefit from the replacement of traditional fuses with ones that minimize sparks and arcs</p>		<p>SMUD plans to replace non-expulsion equipment, including arrestors with arc protection.</p>
<p>Tree attachment removals</p>	<p>SMUD does not have any tree attachments for which to consider</p>		<p>This mitigation strategy does not apply to SMUD's existing equipment</p>
<p>Vegetation Management</p>			
<p>Routine vegetation inspections in accordance with: Public Resources Code (PRC) 4292 & 4393, FAC 003-4, General Order (GO) 95 Rule 35 and Appendix E, and ANSI A300</p>	<p>PRC 4293 and 4293; FAC 004-4; GO 95 is required by the CPUC for investor owned utilities, however, many if not all community owned utilities leverage this as a guideline or applied standard.</p>		<p>SMUD meets requirements and industry practice standards with the inclusion of expanded clearances, additional quality checks, and increased staff availability for at-risk events</p>

<p>LiDAR Technology for vegetation management inspections</p>	<p>LiDAR is demonstrated as an effective tool for transmission level inspection of dense vegetation within the corridor and adjacent to the easement area.</p>		<p>SMUD will be performing a pilot project to explore employing LiDAR imagery techniques to applicable distribution lines. LiDAR will continue to be used on transmission lines.</p>
<p>Hazardous tree/vegetation identification and removal protocols and programs</p>	<p>Within SMUD's service territory and particularly within the high fire risk areas, impact trees could pose a greater potential to catch on fire or contribute to fire spread. Addressing, though identification and surveying, as well as implementing remediation activities will result in further wildfire risk reduction</p>		<p>SMUD routinely identifies potentially at-risk vegetation, including dead/dying, invasive, and leaning trees, to better manage fuels levels and ignition potential.</p>
<p>Off-Cycle / Call-in vegetation removal or corrective work, especially during the fire season</p>	<p>Off-cycle inspections can occur from notifications from a variety of sources, such as adjacent land owners, agricultural entities, and customers as well as first responders. These occurrences could result in utility field patrols and responses to prioritized risk events.</p>		<p>As a priority, repair personnel investigate reports of vegetation on wires. SMUD performs off-cycle vegetation management work when warranted, outside of scheduled inspection and work-related practices. This is in line with industry standards.</p>
<p>Emergency Response & Recovery</p>			
<p>Notify critical facilities and public safety partners, which may include first responders, incident origin law enforcement, acute health care facilities, essential service providers, related governing local and state agencies, adjacent jurisdictions, vulnerable populations, and the Independent System Operator (ISO) (for transmission level de-energization).</p>	<p>Notification practices targeting key stakeholders are crucial during emergency events such as storms and wildfires. While SMUD typically experiences the former, this same practice should be implemented in preparation for fire risk</p>		<p>SMUD's Plan confirms communication efforts with critical facilities</p>
<p>Incident Command Team / Emergency Operations frameworks in the event a de-energization event or wildfire incident occurs</p>	<p>SMUD should leverage the SEMS framework in designing emergency response protocols. A designated team or group of individuals should have the ability to relay information and make informed decisions during emergency response events.</p>		<p>SMUD ensures, through the Plan, that communication lines are clearly determined in sequencing the required events and notification process when an emergency event is activated. SMUD's reach with vested stakeholders in the Sacramento region positions the utility as having the ability to develop strong relationships with the listed entities.</p>

<p>Coordination with stakeholder agencies/entities with routine meetings to discuss emergency preparedness needs and areas of improvement, etc.</p>	<p>SMUD is uniquely positioned as a BANC representative and state capitol electric service provider, allowing greater breadth of collaboration avenues.</p>		<p>SMUD meets the practice strategies as being an integral entity in ensuring key interested stakeholders are engaged to help develop collaborative strategies as well as keep the customer base and key contacts informed on the Plan's efforts and successes. SMUD has been an integral entity in assisting in determining the fire hazard zones with joint efforts of state agencies.</p>
<p>De-Energization & Recloser Operations</p>			
<p>Disabling reclosers through blocking reclosing operations (distribution level) in HFTDs during the fire season and/or during Red Flag Warnings issued by the National Weather Service (or as fire risk potential designates)</p>	<p>Reclosing operations should be defined within the Plan as per statute. Operational best practices align with having settings that align with fire potential weather conditions to prevent potential ignition</p>		<p>SMUD provides its protocols for recloser operations as it relates to wildfire. No new high-speed clearing is proposed to be installed. SMUD describes blocking or disabling reclosing operations.</p>
<p>Internal Operations and Inspection Practices</p>			
<p>Ground patrol as well as aerial inspection practices</p>	<p>Ground patrols are a required strategy in ensuring safe and reliable delivery of electricity. When access concerns arise, aerial inspections provide better coverage in surveying and inspecting electrical equipment throughout the utility service territory</p>		<p>SMUD adequately performs ground and aerial patrols, through detailed protocols within the Plan</p>
<p>Wildfire Infrastructure Protection Teams</p>	<p>An internal team to prepare and protect physical aspects of the electric system as well as ensure effective mitigation measures are carried out would be a prudent activity to pursue</p>		<p>SMUD plans to utilize internal teams targeting risk mitigation, meeting the best practice effort</p>
<p>Infrared corona scanning and high definition imagery technology for inspection practices along with visual inspections</p>	<p>Infrared is an accepted practice that enables better awareness of the utility's equipment</p>		<p>This practice is provided, through detailed procedures, within the Plan</p>

5. METRICS EVALUATION

This section provides an overview of the assessment of presented metrics in SMUD's WMP. The metrics are intended to result in measurable, tracked results illustrating the efficacy of the Plan through to successful implementation. Tracking these metrics leads to meaningful information that will inform appropriate revisions and updates to the Plan in future years. There are no set standards for metric development as they remain unique to a utility's approach in fire prevention and Plan execution.

The statutory requirements for the inclusion of metrics are found in PUC Section 8387(b)(2)(D) and (E) where utilities are directed to present these metrics and address how prior metrics impact the proposed metrics for the next version of the Plan. The 2019 WMP serves as SMUD's first version, providing no previous metrics with which to compare. This evaluation addressed the current metrics, as they exist in the final version of the WMP. The list of metrics is presented in the table below.

Table 9: SMUD WMP Metrics (2019)

Specific Metric	Indicator	Measure of Effectiveness	Bounds
Wire down events caused by SMUD equipment failure	Count of events	No material increase	Fire season (May 1 through October 1)
Ignition events	Count of events	No material increase	

5.1 Assessment of Metrics

Throughout the evaluation process SMUD proposed metrics to better represent measurable indicators that would lead to an effective determination of and reduction of risk. The Plan provides programmatic targets for mitigation measures, which will be tracked and leveraged to shape future metrics to understand the Plan's effectiveness. Two identified key performance indicators in Table 9 represent SMUD's approach to track fire ignitions related to electrical infrastructure. The underlying assumptions suggest that monitoring the frequency and cause of ignition events at different risk seasons of the year will shape the direction of mitigation strategies as this information is collected and analyzed.

The proposed metrics meet the statutory requirements and will assist in providing insight on the effectiveness of the Plan in future years.

6. RESULTS & DISCUSSION

Navigant concluded this assessment on September 3, 2019. Over the course of reviewing SMUD's WMP and supporting documentation, Navigant captured takeaways and findings that align the Plan with state laws and effective wildfire measure demonstration. SMUD's Plan appropriately responds to each of the required elements of PUC Section 8387, which is detailed in Appendix A. The following describes the assessment and resulting findings of the Plan's proposed and established mitigation measures as it applies to safe, reliable operation of all electric infrastructure and wildfire prevention and response.

Report Conclusions

After internal review of the latest version of the WMP and associated data collection products, Navigant concludes this Report with the following:

1. SMUD's WMP aligns appropriately with PUC Section 8387 and includes all required elements.⁹
2. SMUD's Plan is determined to be comprehensive as described through the support documentation of this Report.

⁹ Following acceptance of this Report, SMUD will post the Report and results online for public view. The Report is scheduled for presentation to the Board at a public meeting on or around October 17, 2019. Accomplishing these follow-up tasks will meet all required statutory provisions up until presenting the final WMP to the Board.

APPENDIX A. STATUTORY COMPLIANCE MATRIX

Required Statutory Element	Plan Section Reference(s)	SMUD Plan Elements (Summarized)	Meets Section Elements (Determination)
<p>(a) Each local publicly owned electric utility and electrical cooperative shall construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of wildfire posed by those electrical lines and equipment.</p>			
<p>(b) (1) The local publicly owned electric utility or electrical cooperative shall, before January 1, 2020, prepare a wildfire mitigation plan. After January 1, 2020, a local publicly owned electric utility or electrical cooperative shall prepare a wildfire mitigation plan annually and shall submit the plan to the California Wildfire Safety Advisory Board on or before July 1 of that calendar year. Each local publicly owned electric utility and electrical cooperative shall update its plan annually and submit the update to the California Wildfire Safety Advisory Board by July 1 of each year. At least once every three years, the submission shall be a comprehensive revision of the plan.</p>			
<p>(2) The wildfire mitigation plan shall consider as necessary, at minimum, all of the following:</p>			
<p>(A) An accounting of the responsibilities of persons responsible for executing the plan.</p>	<p>9.1.1</p>	<ul style="list-style-type: none"> • Chief Grid Strategy and Operations Officer oversees the overall WMP • Chief Energy Delivery Officer and Chief Customer Officers are responsible for executing the Plan • Table 6 lists out Mitigation Activities and Responsible Operating Units 	<p>Yes</p>
<p>(B) The objectives of the wildfire mitigation plan.</p>	<p>1.3</p>	<p>Primary Objectives:</p> <ol style="list-style-type: none"> 1. Minimize risk probability of SMUD's transmission and distribution system being an origin or contributing source for a wildfire ignition 2. Implement a WMP that embraces safety, prevention, mitigation, and recovery as a <i>central priority</i> for SMUD 3. Create a WMP that is consistent with state law and objectives 	<p>Yes</p>

<p>(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.</p>	<p>3</p>	<p>Table 2 includes the list of mitigation strategies and programs. These cover the following areas:</p> <ul style="list-style-type: none"> • Design and construction • Inspection and maintenance • Operational practices • Situational/Conditional awareness • Response and recovery 	<p>Yes</p>
<p>(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.</p>	<p>9.3.1</p>	<p>Table 7 lists out the specified metrics SMUD plans to track</p>	<p>Yes</p>
<p>(E) A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.</p>	<p>9.2.1</p>	<p>As this is the first iteration of the WMP, there are no metrics to compare against.</p>	<p>Yes</p>
<p>(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.</p>	<p>6.1.1, 7.2</p>	<p>Fire season is defined as:</p> <ul style="list-style-type: none"> - May 1 to October 1, or - Red Flag Warning (RFW) in effect for areas inside or immediately surrounding the PCA <p>SMUD disables automatic reclosing on certain substation and line reclosers that extend into the PCA.</p>	<p>Yes</p>

(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.

7.1, 7.2

Procedures for proactive communication due to a wildfire threat to:

- 1) SMUD service territory localized circuits that results in de-energization.
- 2) SMUD's UARP hydroelectric generation and transmission system that results in a de-energization event and resulting rolling outages.
- 3) a shared transmission line that impacts the grid at large, resulting in a resource shortage for the utilities, including SMUD, that rely on the line

- SMUD's Contact Center, social media, and website will provide ongoing notifications and available resources for communicating outage events and de-energization decisions as well as educational resources on wildfire safety.
- Public Safety Power Shutoff (PSPS) events will be alerted to affected stakeholders as early as possible, which includes:
 - potentially impacted customers
 - media, local agencies, first responders, elected officials
 - critical customers, which includes water and telecommunications utilities that may be impacted

Event Communications

- Whenever possible, provide potentially impacted customers with notice before a PSPS event, using available channels
- Interactive Voice Response functions for real-time recorded information
- sending out automated, pre-recorded calls to potentially impacted customers
- Customers enrolled in the Medical Equipment Discount Rate program will receive annual letters/emails to remind them of their unique risk of wildfire danger and to have a back-up plan if an outage occurs
- Essential / Critical Services contacted:
 - agencies providing essential fire, police and prison services
 - Government agencies essential to national defense
 - Hospitals, assisted living, and skilled nursing facilities
 - Communication utilities and

Yes

		<p>telephone utilities</p> <ul style="list-style-type: none">- and television broadcasting stations used for broadcasting emergency messages, instruction, and other public information related to the electric curtailment emergency- Water and sewage treatment utilities identified as necessary for services such as firefighting	
--	--	--	--

<p>(H) Plans for vegetation management.</p>	<p>6.4</p>	<p>Compliance Standards:</p> <ul style="list-style-type: none"> • FAC-003-4 • PRC Section 4292 and 4293 • CPUC GO 95 Rule 35 (required for IOUs, generally accepted practices by POUs) <p>Distribution System Vegetation Management</p> <ul style="list-style-type: none"> • Routine vegetation maintenance: pruning and removal, time-based intervals • Third-party contracting support for annual vegetation work identification <p>Transmission System Vegetation Management</p> <ul style="list-style-type: none"> • Ground-based field patrols • Annual aerial patrols • Third-party contracting support for annual vegetation work identification 	<p>Yes</p>
<p>(I) Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.</p>	<p>6.3</p>	<p>Transmission Line Inspections</p> <ul style="list-style-type: none"> • Aerial patrols (via helicopter) • Ground patrols • IR camera inspections (via helicopter) • Wood pole intrusive inspections • Vegetation right-of-way maintenance • Splice assessment program <p>Distribution Line Inspections</p> <ul style="list-style-type: none"> • Detailed line inspections • Line patrols • 69 kV and Pole Clearing Area 12 kV IR inspections (via helicopter) • Wood pole intrusive inspections • Annual pole clearing program • Distribution substation inspections • Visual inspections 	<p>Yes</p>
<p>(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:</p>	<p>4.3</p>	<p>Figure 4 presents a Bow-Tie risk assessment diagram that displays risk drivers</p>	<p>Yes</p>
<p>(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.</p>	<p>4.3</p>	<ul style="list-style-type: none"> • Electrical equipment contacts from objects • Equipment / Facility failures • Wire to wire contact / contamination • Third-party acts / vandalism • Acts of SMUD • Unknown factors 	<p>Yes</p>

<p>(ii) Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the local publicly owned electric utility's or electrical cooperative's service territory.</p>	<p>4.2, 5.1</p>	<p>Acknowledged climate change reports and reference material to indicate the need for mitigation efforts based upon increased climate risk in California.</p> <p>SMUD's service territory is outside the HFTD, with its URAP facilities within Tier 2 and Tier 3 designations</p> <p>Table 4 lists the circuit assets related to distribution and transmission and which segments (in circuit-miles) exist in HFTDs</p> <p>Figure 6 illustrates the UARP facilities within the Tier 2 and Tier 3 designations</p>	<p>Yes</p>
<p>(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.</p>	<p>5.1</p>	<p>SMUD actively participated in the development of the Commission's Fire-Threat Map and has incorporated the High Fire-Threat District map into its construction, inspection, maintenance, repair, and clearance practices, when applicable.</p> <ul style="list-style-type: none"> • Affirmed through the map development process that SMUD's service area is outside the HFTD • Upper American River Project facilities properly identified based on Tier category • SMUD does not recommend changes, and will continue to evaluate factors that may indicate the Commission should expand the HFTD to include additional areas 	<p>Yes</p>
<p>(L) A methodology for identifying and presenting enterprise wide safety risk and wildfire-related risk.</p>	<p>4.1, 4.3</p>	<p>Enterprise Risk Management framework</p> <ol style="list-style-type: none"> 1. Identify 2. Analyze 3. Plan and Evaluate 4. Respond 5. Monitor <p>Figure 4 illustrates the risk drivers that trigger a risk event and the associated consequences/key risk impacts that can result from the incident</p>	<p>Yes</p>

<p>(M) A statement of how the local publicly owned electric utility or electrical cooperative will restore service after a wildfire.</p>	<p>8</p>	<ol style="list-style-type: none"> 1. Patrol the line to check for vegetation near the lines or clear damage that may prevent safe reenergization 2. Repair any identified damage of the utility's electrical equipment. Vegetation management crews may also be called out. 3. Test the lines by closing the fuse or breaker to reenergize the line segment. 4. Restore power safely with the outage communication system providing notification of power restoration to the affected customers. 	<p>Yes</p>
<p>(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:</p>			
<p>(i) Monitor and audit the implementation of the wildfire mitigation plan.</p>	<p>9.4</p>	<p>SMUD's Chief Grid Strategy and Operations and Chief Energy Delivery Officers (Chiefs) will be responsible for monitoring and auditing the targets specified in the WMP to confirm that the objectives of the WMP are met.</p>	<p>Yes</p>
<p>(ii) Identify any deficiencies in the wildfire mitigation plan or its implementation, and correct those deficiencies.</p>	<p>9.4</p>	<p>At any point that deficiencies are identified, the Chiefs or their designees will be responsible for correcting those deficiencies. Since this is the first iteration of the WMP, there are no comparisons to make for this version.</p>	<p>Yes</p>
<p>(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.</p>	<p>9.3.1</p>	<p>Table 8 displays the metrics for the programmatic targets of SMUD's inspection and maintenance programs.</p>	<p>Yes</p>
<p>(3) The local publicly owned electric utility or electrical cooperative shall, on or before January 1, 2020, and not less than annually thereafter, present its wildfire mitigation plan in an appropriately noticed public meeting. The local publicly owned electric utility or electrical cooperative shall accept comments on its wildfire mitigation plan from the public, other local and state agencies, and interested parties, and shall verify that the wildfire mitigation plan complies with all applicable rules, regulations, and standards, as appropriate.</p>	<p>10</p>	<p>SMUD will present its WMP to the Board at a public meeting in the final months of 2019.</p>	<p>Yes</p>

<p>(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 website 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.</p>	<p>10</p>	<p>SMUD contracted with Navigant Consulting, Inc. to perform an independent evaluation of its WMP. Qualifications are described in Section 1.</p>	<p>Yes</p>
--	-----------	---	------------

APPENDIX B. INDUSTRY PRACTICE STRATEGY COMPARISON MATRIX

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination
<i>Situational Awareness / Weather Conditions</i>				
<p>Investing or investigating in opportunities to procure weather stations for instantaneous weather condition reporting</p>	<p>Having access to internal mechanisms to track fire conditions (high wind, dry conditions, high heat), will aid in responding to and preventing potential fires by enacting related protocols during fire watch conditions</p>	<p>Especially in High Fire-Threat Districts (HFTDs) weather stations would allow SMUD personnel to have access to real-time monitoring of these areas</p>	<p>SMUD has 14 weather stations within its service territory and the Upper American River Project (UARP). - 8 are in the Sacramento metropolitan area - 6 are in the UARP region</p>	<p>SMUD has adequate coverage of this mitigation measure across its Tier 2 and 3 areas and has included additional weather stations in the HFTD as well as within its service territory, which has less risk exposure</p>
<p>Instantaneous weather conditions web-based portal and GIS data sharing capabilities; weather monitoring</p>	<p>Real-time, weather update tracking allows deepened awareness of the conditions that may lead to a spark or ignition. The weather station servers are able to capture and record several weather and meteorological attributes, allowing forecasting scenarios and learning experiences from high-risk events. The presentation and visualization of this data through GIS monitoring applications will assist future risk models and fire prevention planning</p>	<p>With the added weather stations along with existing ones, SMUD should have the ability to capture and interpret the information sent in real-time for operations that warrant mitigation measures.</p>	<p>SMUD leverages instantaneous data collection from weather station servers to influence decision-making needs for mitigation efforts</p>	<p>Four new weather stations were installed in 2018 within the UARP region to support HFTD situational awareness. The inclusion of additional weather stations compared to the low risk environment of SMUD's service territory and facilities results in a determination of meeting the identified strategy.</p>

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination
<p>Cameras with night vision mode capability atop of electrical structures</p>	<p>Visual inspections can be enhanced through the use of cameras with high definition and night vision capabilities. This measure improves response times in addressing risk incidents and de-energization</p>	<p>SMUD has facilities within HFTDs that would benefit from additional visibility into the regions with greatest threat of ignition or fire spread</p>	<p>SMUD is evaluating the potential to install fire monitoring cameras on towers within the UARP Transmission Corridor to mitigate fire risk</p>	<p style="text-align: center;"></p> <p>SMUD will be considering the procurement of pole-top cameras for better visibility as mentioned in Table 2 of the Plan as a pilot project.</p>
System Hardening / Design & Construction				
<p>Replacing bare wires with covered conductors</p>	<p>Covered wire is a well-demonstrated prevention method to sparks / ignitions during severe weather conditions. Several utilities are employing pilot programs of covered wire replacement of distribution lines, prioritizing High Fire-Threat Districts for implementation.</p>	<p>SMUD has applicable powerlines within HFTDs that would benefit from additional hardening such as covered wire replacement for existing, legacy bare wire</p>	<p>SMUD is evaluating the potential to harden 3.1 miles of circuit lines within Tier 2 and 3 high fire threat areas to further reduce equipment risk.</p>	<p style="text-align: center;"></p> <p>SMUD is performing the engineering analysis to determine the strategy to place bare wire in Tier 2 and Tier 3 areas. Once the strategy is determined, SMUD proposes to begin bare wire replacement in 2020.</p>
<p>New or planned electrical lines (distribution and transmission) that are designed to withstand working loads under the stress above design standards to address high wind speeds</p>	<p>As new capital infrastructure plans are developed, it would be prudent to consider resilient design standards that can withstand sustained winds and gusts that occur during Red Flag Warning periods.</p>	<p>New line construction standards are taken into consideration in accordance with GO95.</p>	<p>As new capital infrastructure is planned, SMUD will perform construction in accordance with GO95.</p>	<p style="text-align: center;"></p> <p>As SMUD's develops capital infrastructure plans it assures compliance with GO95</p>

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination
<p>Steel or composite poles swapped out for wood poles, at minimum, within HFTDs or fireproofing wooden poles (fire resistant material coating)</p>	<p>When considering pole replacement strategies, when applicable, composite or steel poles can reduce the risk that wood poles present. At minimum, fire retardant material can be coated to temporarily enhance the ability to prevent fire spread or impact the stability of the structure under fire threat.</p>	<p>While pole remediation activities exist, such as additional clearing, coring to test structural integrity, and coating mechanisms, when new poles are considered for high fire severity zones, more resilient designs should be a consideration.</p>	<p>When remediation warrants, SMUD is considering installing steel poles for wood poles in certain cases (and use covered conductors in others). SMUD also has expanded pole clearing areas to remove excess brush and vegetation additional remediation activities.</p>	<p>The Plan states that steel poles will be considered as replacement activities warrant the activity. This aligns with the identified strategy.</p>
<p>Pole loading assessment and remediation</p>	<p>Carry out programs that address pole loading issues and inspections that would result in remediation to infrastructure.</p>	<p>SMUD must comply with PRC 4292 for pole clearing activities for vegetation risk and should also maintain awareness of the decay and structural integrity of aged or impacted poles within the service territory and UARP region.</p>	<p>SMUD performs:</p> <ul style="list-style-type: none"> - intrusive core testing of wood poles (10 year cycle with maximum cycle of 14 years) - visual inspections - Detailed Line inspections every five years on overhead equipment, including poles - PRC 4292 compliance vegetation clearing around poles (annual) within Pole Clearing Area (PCA) - pole loading assessments - replacing poles with steel, where/when applicable 	<p>SMUD complies with state requirements as well as meets the practice standard for pole loading and remediation. While depicted in Table 2, SMUD should expand the descriptions within the Plan to provide an understanding of these practices.</p>
<p>Expulsion fuse device change out to current-limiting (non-expulsive) fuses</p>	<p>Traditional fuses pose a fire risk due to the ignited material that can be expelled. Best practices for mitigating this risk is to change out these fuses with non-expulsive fuses</p>	<p>SMUD's PCA and inclusive high fire threat areas would benefit from the replacement of traditional fuses with ones that minimize sparks and arcs</p>	<p>SMUD plans to replace non-expulsion equipment (fuses and arrestors) within the Pole Clearing Area (PCA) (CAL Fire exempt fuses) and tier 2 and tier 3 with non-expulsive type fuses.</p>	<p>SMUD plans to replace non-expulsion equipment, including arrestors with arc protection.</p>

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination	
<p>Tree attachment removals</p>	<p>This practice involves the removal of electrical infrastructure fastened to trees for infrastructural support but can be a source of ignition. The removal of these legacy devices, in many instances, can significantly reduce electrical spark risk.</p>	<p>SMUD does not have any tree attachments for which to consider</p>	<p>SMUD does not have any tree attachments for which to consider</p>		<p>This mitigation strategy does not apply to SMUD's existing equipment</p>
<p>Vegetation Management</p>					
<p>Routine vegetation inspections in accordance with: Public Resources Code (PRC) 4292 & 4393, FAC 003-4, General Order (GO) 95 Rule 35 and Appendix E, and ANSI A300</p>	<p>State and federal compliance for vegetation management and inspection, as well as California Public Utilities Commission GO 95, which is accepted as industry standard amongst all utilities. (Community and investor owned).</p>	<p>PRC 4293 and 4293; FAC 004-4; GO 95 is required by the CPUC for investor owned utilities, however, many if not all community owned utilities leverage this as a guideline or applied standard.</p>	<p>SMUD ensures all state laws and mandates are met as well as enacting a HFTD vegetation management inspection strategy.</p> <p>SMUD will employ the following vegetation management strategies:</p> <ul style="list-style-type: none"> - HFTD vegetation inspection strategy - increased staff for line and vegetation management crews in preparation of storms/weather events - increased vegetation clearances - Quality assurance accountability for inspection and mitigation activities - Adequate training for safety and vegetation management work for T&D lines - Fuels reduction work 		<p>SMUD meets requirements and industry practice standard with the inclusion of expanded clearances, additional quality checks, and increased staff availability for at-risk events</p>

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination
<p>LiDAR Technology for vegetation management inspections</p>	<p>Where foot patrols or normal helicopter patrols are insufficient to evaluate the right-of-way (ROW) clearance, utilities use LiDAR technology to identify trees along the ROW border that can potentially contact with lines during high wind events.</p>	<p>LiDAR is demonstrated as an effective tool for transmission level inspection of dense vegetation within the corridor and adjacent to the easement area.</p>	<p>SMUD applies LiDAR imaging technology on transmission line infrastructure and is proposing plans to employ the same strategy for distribution lines.</p>	<p style="text-align: center;"></p> <p>SMUD will be performing a pilot project to explore employing LiDAR imagery techniques to applicable distribution lines. LIDAR will continue to be used on transmission lines.</p>
<p>Hazardous tree/vegetation identification and removal protocols and programs</p>	<p>Recording and tagging trees that pose risks to adjacent electrical equipment or are dead/dying are considered prudent efforts for vegetation management practices</p>	<p>Within SMUD's service territory and particularly within the high fire risk areas, impact trees could pose a greater potential to catch on fire or contribute to fire spread. Addressing, though identification and surveying, as well as implementing remediation activities will result in further wildfire risk reduction</p>	<p>SMUD's vegetation management ROW maintenance program identifies incompatible species to maintain low-growing flora through wire zone-bore zone management practices.</p>	<p style="text-align: center;"></p> <p>SMUD routinely identifies potentially at-risk vegetation, including dead/dying, invasive, and leaning trees, to better manage fuels levels and ignition potential.</p>
<p>Off-Cycle / Call-in vegetation removal or corrective work, especially during the fire season</p>	<p>Off-cycle practices of vegetation inspection and management</p>	<p>Off-cycle inspections can occur from notifications from a variety of sources, such as adjacent land owners, agricultural entities, and customers as well as first responders. These occurrences could result in utility field patrols and responses to prioritized risk events.</p>	<p>SMUD performs corrective work when call-in notifications are made and verified as 1) SMUD's electrical equipment and 2) a fire risk or public safety issue</p>	<p style="text-align: center;"></p> <p>As a priority, repair personnel investigate reports of vegetation on wires. SMUD performs off-cycle vegetation management work when warranted, outside of scheduled inspection and work-related practices. This is in line with industry standards.</p>

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination
Emergency Response & Recovery				
<p>Notify critical facilities and public safety partners, which may include first responders, incident origin law enforcement, acute health care facilities, essential service providers, related governing local and state agencies, adjacent jurisdictions, vulnerable populations, and the Independent System Operator (ISO) (for transmission level de-energization).</p>	<p>Following a sequence of events in contacting public safety partners and impacted community facilities will enable quicker response in reacting to an emergency event (such as a wildfire or de-energization). Utilities should describe their processes to notify critical facilities as it applies to their service territory and impacted communities as well as grid operators.</p>	<p>Notification practices targeting key stakeholders are crucial during emergency events such as storms and wildfires. While SMUD typically experiences the former, this same practice should be implemented in preparation for fire risk</p>	<p>SMUD identifies that notification procedures include informing customers and critical facilities during emergency events.</p>	<p>SMUD's Plan confirms communication efforts with critical facilities</p>
<p>Incident Command Team / Emergency Operations frameworks in the event a de-energization event or wildfire incident occurs</p>	<p>Using the State Emergency Management System (SEMS) framework, which is determined on the Federal Emergency Management Agency (FEMA) structure for incident command protocols will ensure prepared and adequately trained staff to respond in effective communication manners as well as respond to risk events in a sequence of effective procedures</p>	<p>SMUD should leverage the SEMS framework in designing emergency response protocols. A designated team or group of individuals should have the ability to relay information and make informed decisions during emergency response events.</p>	<p>SMUD will provide liaison to county office of emergency services' (OES) during fire incidents. SMUD has two primary coordination points and maintains relationships with Placer, Solano, and Yuba counties. Several representatives are listed as being part of the EOC structure. SMUD applies the SEMS framework for its incident command structure.</p>	<p>SMUD ensures, through the Plan, that communication lines are clearly determined in sequencing the required events and notification process when an emergency event is activated. SMUD's reach with vested stakeholders in the Sacramento region positions the utility as having the ability to develop strong relationships with the listed entities.</p>

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination
<p>Coordination with stakeholder agencies/entities with routine meetings to discuss emergency preparedness needs and areas of improvement, etc.</p>	<p>Communicating with vested stakeholders during wildfire mitigation activities, PSPS events, and general strategy development will help drive efforts to better align with the risk profile of the utility's service and asset territory. These efforts should occur throughout the year and wildfire mitigation plan planning process</p>	<p>SMUD is uniquely positioned as a BANC representative and state capitol electric service provider, allowing greater breadth of collaboration avenues.</p>	<p>SMUD interacts with executive staff of local governments and agencies, local officials, state delegates, federal representatives and critical facilities to keep them updated on wildfire mitigation efforts. SMUD additionally works with local governing jurisdictions, public utilities, nonprofits and other services to help develop partnerships and strategy opportunities to further mitigate wildfire risk</p>	<p>SMUD meets the practice strategies as being an integral entity in ensuring key interested stakeholders are engaged to help develop collaborative strategies as well as keep the customer base and key contacts informed on the Plan's efforts and successes. SMUD has been an integral entity in assisting in determining the fire hazard zones with joint efforts of state agencies.</p>
<p>De-Energization & Recloser Operations</p>				
<p>Disabling reclosers through blocking reclosing operations (distribution level) in HFTDs during the fire season and/or during Red Flag Warnings issued by the National Weather Service (or as fire risk potential designates)</p>	<p>Disabling reclosing reduces the number of potential ignition events during a fault condition</p>	<p>Reclosing operations should be defined within the Plan as per statute. Operational best practices align with having settings that align with fire potential weather conditions to prevent potential ignition</p>	<p>SMUD adopted procedures for the operation of its reclosers during its determined fire season and when RFW are issued within and immediately surrounding the PCA</p>	<p>SMUD provides its protocols for recloser operations as it relates to wildfire. No new high-speed clearing is proposed to be installed. SMUD describes blocking or disabling reclosing operations.</p>

Identified Practice Strategy	Mitigation Rationale	SMUD Applicability	Plan Elements	Determination
Internal Operations and Inspection Practices				
Ground patrol as well as aerial inspection practices	Routine ground patrols are implicit practices in equipment and vegetation inspection protocols. Increasing the frequency, especially in HFTDs, presents as effective preventative measures and ensures the integrity of electrical equipment. Aerial inspections, by way of helicopters, will lead to greater coverage of the service territory and areas adjacent to required clearances	Ground patrols are a required strategy in ensuring safe and reliable delivery of electricity. When access concerns arise, aerial inspections provide better coverage in surveying and inspecting electrical equipment throughout the utility service territory	Aerial inspections of transmission lines through helicopters in order to inspect the condition of line structures and attachments. These are performed twice a year within the UARP area and once within the Sacramento Valley	<p>SMUD adequately performs ground and aerial patrols, through detailed protocols within the Plan</p>
Wildfire Infrastructure Protection Teams	An internal team to help coordinate efforts to ensure the Plan is being followed as well as coordinating efforts to enhance the Plan's strategies and quality check that activities are being performed and tracked aligning with the Plan	An internal team to prepare and protect physical aspects of the electric system as well as ensure effective mitigation measures are carried out would be a prudent activity to pursue	SMUD's Plan provides a structure for Safety and Physical Security Protection Teams, achieving similar goals in asset protection and risk mitigation	<p>SMUD plans to utilize internal teams targeting risk mitigation, meeting the best practice effort</p>
Infrared corona scanning and high definition imagery technology for inspection practices along with visual inspections	infrared and ultraviolet (Corona) light cameras are typically mounted to helicopters with special attention to splices, conductor connection/attachment points, and insulators for a detailed visual of electrical equipment	Infrared is an accepted practice that enables better awareness of the utility's equipment	Line inspectors use infrared inspections through ground patrol efforts to make detailed inspections on assets and utilize clear-viewing tools such as binoculars to assess visible damage or issues warranting corrective action.	<p>This practice is provided, through detailed procedures, within the Plan</p>