

TURLOCK IRRIGATION DISTRICT (TID)

WILDFIRE MITIGATION PLAN

INDEPENDENT EVALUATION REPORT

April 3, 2020



DISCLAIMER

California Senate Bill 901 (SB 901) mandates that local publicly owned electric utilities or electrical cooperatives shall, before January 1, 2020, prepare a Wildfire Mitigation Plan (WMP or Plan). Additionally, publicly owned electric utilities and electrical cooperatives are required to contract with a qualified independent evaluator with experience to assess the comprehensiveness of its WMP.

Turlock Irrigation District (TID) has requested Grid Subject Matter Experts ("GridSME") to conduct a review and assessment of their WMP to ensure it meets the requirements outlined in SB 901. GridSME's review and assessment is based on TID's WMP alone and evaluates only the comprehensiveness of the Plan as it is written.

The information provided in this review and report represents GridSME's analysis based only on the information available at the time the review was conducted. GridSME is not responsible for the success or failure of TID's projects nor any potential ignition resulting therefrom. GridSME makes no representations or warranties expressed or implied regarding the reliability or thoroughness of TID's WMP. Recipients of the assessment report assume all liabilities incurred by themselves, or third parties, resulting from their reliance on the report, or the data, information, and/or assessment contained therein.

Table of Contents

1.0	Executive Summary:	4
2.0	Introduction:	5
3.0	Company Overview:	5
4.0	Independent Evaluation:	8
4.1	PUC §8387 (2)(A).....	8
4.2	PUC §8387 (2)(B).....	9
4.3	PUC §8387 (2)(C).....	9
4.4	PUC §8387 (2)(D).....	10
4.5	PUC §8387 (2)(E)	11
4.6	PUC §8387 (2)(F)	11
4.7	PUC §8387 (2)(G).....	12
4.8	PUC §8387 (2)(H).....	13
4.9	PUC §8387 (2)(I).....	16
4.10	PUC §8387 (2)(J)(i) and (2)(J)(ii)	16
4.11	PUC §8387 (2)(K)	17
4.12	PUC §8387 (2)(L)	17
4.13	PUC §8387 (2)(M).....	18
4.14	PUC §8387 (2)(N)(i) and (2)(N)(ii) and 2(N)(iii).....	18
5.0	Summary	19

1.0 Executive Summary:

On September 21, 2018 California Governor Jerry Brown signed Senate Bill (SB) 901 which amends Public Utilities Code (PUC) §8387 and states that “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. They will prepare a wildfire mitigation plan before January 1, 2020 and 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 (IE) 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”.

In accordance with PUC §8387(3) and 8387(3)(c) Turlock Irrigation District (TID) presented its Wildfire Mitigation Plan (WMP or Plan) at an appropriately noticed public meeting on 11/05/2019 and received Plan approval from the TID Board of Directors. TID then contracted with Grid Subject Matter Experts (GridSME) to provide an independent evaluation of their WMP to review and assess the comprehensiveness of their Plan. As of the time of this review the California Public Utilities Commission (CPUC) Wildfire Safety Division has not issued formal guidelines or requirements regarding an IE’s WMP review. Therefore, GridSME’s evaluation of the TID Plan consisted of only a review of the written Plan to ensure that TID’s WMP addressed each of the required elements of PUC §8387 as it relates to publicly owned utilities (POU).

The GridSME IE team brings over 100 years of combined power system operations experience and are qualified to review the comprehensiveness of TID’s WMP. Based on this high-level review, GridSME concludes TID’s WMP is comprehensive and meets the requirements of PUC §8387.

2.0 Introduction:

Over the past several years the threat of catastrophic wildfires has significantly increased in the state of California. These fires are fueled in part by changing weather patterns such as extended drought conditions, more intense windstorms, hotter temperatures; and at-risk fuel such as dead or diseased vegetation, etc. Following a thorough investigation of these catastrophic wildfires, the fire authorities have concluded that electrical facilities were the source of ignition for some of these fires.

In order to comply with State law and the requirements of PUC §8387 TID prepared its WMP detailing fire mitigation efforts and programs to 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. This report provides a high-level assessment of TID efforts to comply with each of the elements of PUC §8387 and a short description of the assessment by the IE.

3.0 Company Overview:

TID is a community owned, not-for-profit irrigation water and electric utility formed in 1887 and was the first irrigation district in California. Organized under the Wright Act, it is governed by a five-member Board of Directors and operates under the provisions of the California Water Code.

TID's electric service territory spans approximately 676 square miles, from the crest of the Coast Range across the Central Valley to the foothills of the Sierra Nevada mountains adjacent to Don Pedro Reservoir (See figure 1 below). TID provides retail electric service in Stanislaus and Tuolumne Counties, across the cities of Turlock, Ceres, south Modesto, Keyes, Delhi, Hilmar, Patterson, Diablo Grande, Denair, Hickman, Ballico, and La Grange. TID serves approximately 100,000 electric customers with an annual peak load average of 537 MW over the last three years, with an all-time peak of 549 MW in 2017.

TID operates 379 miles of 230kV, 115kV, and 69kV transmission lines and distributes electricity at 12kV through above and below-ground lines. TID derives its generation from TID-owned hydroelectric plants, thermal plants, and a wind power facility. It also purchases additional power from various regional resources, including solar, hydro, and thermal power.

Less than 10% of TID's electrical facilities are located in a Tier 2 High Fire Threat District (HFTD) and no facilities in a Tier 3 HFTD. Tier 2 fire-threat areas depict areas where there is an elevated risk (including likelihood and potential impacts on people and property) from utility associated wildfires. Tier 3 fire-threat areas depict areas where there is an extreme risk (including likelihood and potential impacts on people and property) from utility associated wildfires. Much of the TID service territory is in the San Joaquin Valley with no history of catastrophic wildfires. Based on historical fires in the region, type of vegetation, or historical intensity of Red Flag Warning conditions, the TID service territory is generally considered very low risk for a catastrophic wildfire.

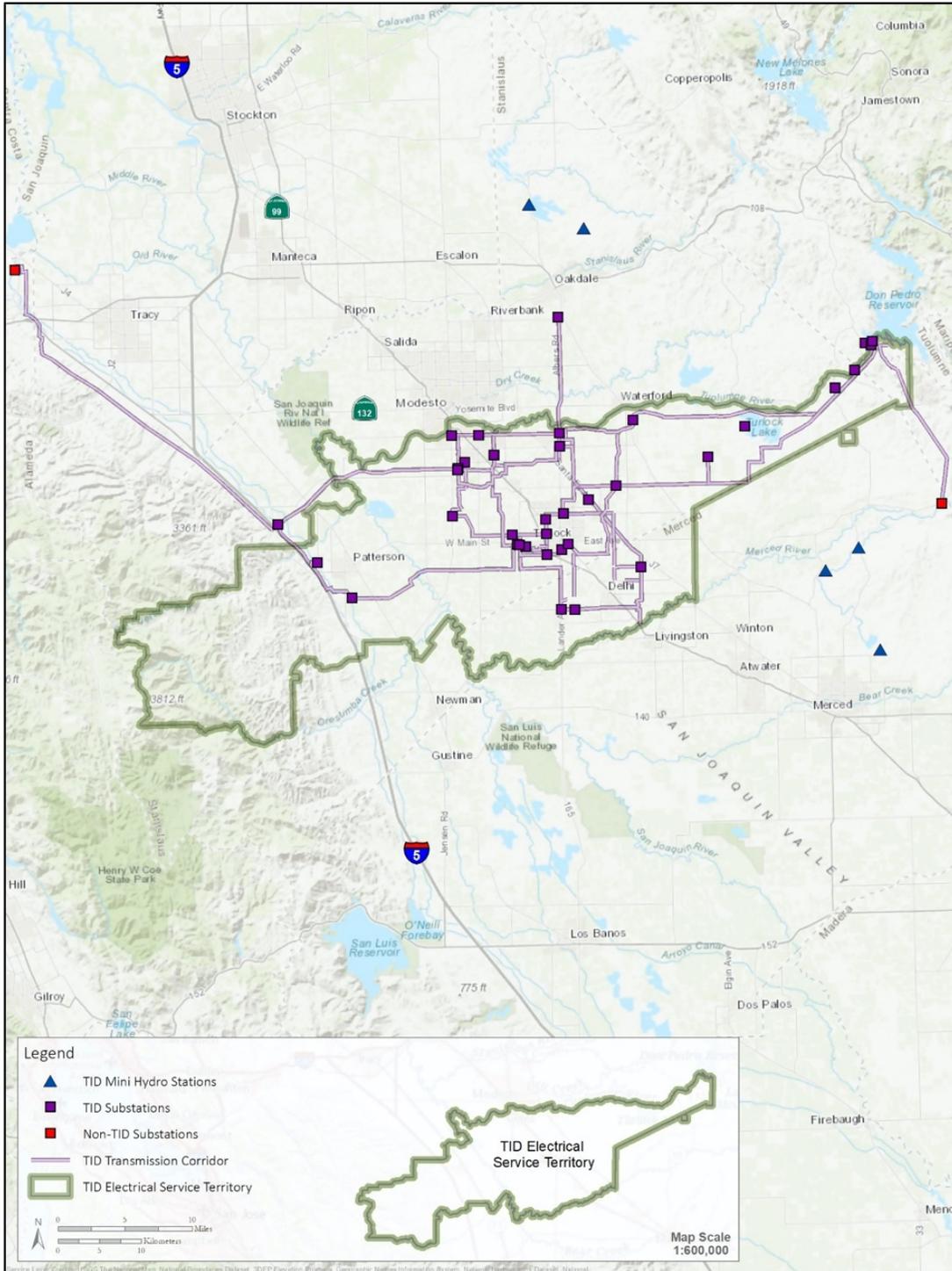


Figure 1 - TID's Electric Service Territory

4.0 Independent Evaluation:

TID's WMP and compliance with PUC §8387 are outlined under three primary objectives aimed at minimizing the probability that TID's electrical facilities may be the origin or contributing source for the ignition of a catastrophic wildfire. They are:

1. Minimize electrical sources of ignition,
2. Maintain resiliency of the electric grid, and
3. Evaluate plan performance and effectiveness.

Each element of PUC §8387 is listed separately below with a high-level narrative of the plan assessment, the comprehensiveness of the plan, and recommendations for inclusion in future Plan updates, if any.

4.1 PUC §8387 (2)(A)

Requirement:

An accounting of the responsibilities of persons responsible for executing the plan.

Assessment:

Section 9.1, Roles and Responsibilities for Plan Execution, clearly defines who at TID is responsible for executing this plan. The TID Board of Directors has responsibility for Plan approval. The TID General Manager has overall accountability for the development and implementation of this WMP and delegates specific responsibilities to section leadership who have specific responsibilities such as vegetation management, substation inspections, line inspections, line construction, etc.

4.2 PUC §8387 (2)(B)

Requirement:

The objectives of the wildfire mitigation plan.

Assessment:

TID's WMP and compliance with PUC §8387 are outlined under three primary objectives. Outlined in Section 2.0 and throughout the WMP, those three objectives are aimed at minimizing the probability that TID's electrical facilities may be the origin or contributing source for the ignition of a catastrophic wildfire. They are:

1. Minimize electrical sources of ignition,
2. Maintain resiliency of the electric grid, and
3. Evaluate plan performance and effectiveness.

4.3 PUC §8387 (2)(C)

Requirement:

A description of the preventative 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.

Assessment:

TID's WMP provides a comprehensive list of programs undertaken by TID to minimize the probability that its electrical facilities may be the origin or contributing source for the ignition of a catastrophic wildfire. Programs listed are weather monitoring, design and construction standards, vegetation management, equipment inspections, and other programs, such as Public Safety Power Shutoff (PSPS) that will be further addressed in subsequent sections.

Although TID outlines numerous system hardening strategies for reducing the risk of its electrical lines and equipment causing catastrophic wildfires, GridSME recommends the following:

1. Assess the need for installing additional weather stations within their service territory to monitor weather conditions directly impacting their facilities. Today, TID utilizes the National Weather Service weather reports for real-time and forecasted weather information.
2. TID provides a comprehensive list of programs to be completed in 2019 and 2020. A more comprehensive list of programs for 2021 will be provided in TID's 2020 filing. It is recommended that TID provide a table that documents yearly results and progress of each program.

4.4 PUC §8387 (2)(D)

Requirement:

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.

Assessment:

Section 9.2 of TID's WMP lists seven proposed metrics to monitor the performance of their Plan. It is intended that the 2019 results of these metrics will establish the baseline to determine effectiveness of the Plan and serve as a basis for future Plan revisions and updates.

4.5 PUC §8387 (2)(E)

Requirement:

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

Assessment:

TID provided no metrics from prior years for monitoring and tracking Plan performance. TID relied on personal experience of long-term employees to provide historical failure and system performance trends. As previously mentioned, TID will use 2019 results of listed metrics to establish the baseline and determine effectiveness of their Plan going forward.

4.6 PUC §8387 (2)(F)

Requirement:

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.

Assessment:

TID will disable line reclosers on all lines within the TID Fire Zones any time the National Weather Service declares a Red Flag Warning. TID considers the risk for a powerline-ignited catastrophic wildfire within their service territory as low. However, they have designated two areas as TID Fire Zones which are inclusive of the CPUC Tier 2 HFTD and Cal Fire's State Responsibility Area (SRA). There is no Tier 3 HFTD within TID's service territory.

Due to the low fire risk and historical fire weather conditions, TID does not anticipate executing a PSPS by operating TID equipment. However, described in

section 6.8 of their WMP, there are 36 customers (TID meters) in the western portion of their service territory that are served from a line supplied by a neighboring investor owned utility (IOU). The IOU's line (circuit) is subject to a PSPS which will turn off power to these 36 customers if the IOU executes a PSPS on that circuit. Sections 7.3 and 7.4 of the WMP describe the comprehensive protocols that TID has in place for communicating with these customers during critical fire weather conditions including prior to a PSPS.

For future Plan updates, it is recommended that TID describe, in the WMP, their process for supporting vulnerable customers (Access and Functional Needs population) that could be impacted by a PSPS. These are customers that could require electric powered life support systems or customers that may need transportation assistance if required to evacuate. TID has a formal process in place for communicating and supporting the AFN population, however, no vulnerable customers have currently been identified in areas where a PSPS is possible.

4.7 PUC §8387 (2)(G)

Requirement:

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.

Assessment:

A PSPS could pose significant impacts to public safety. In section 7.3 and 7.4, TID describes public outreach communications and communications to critical service providers prior to a PSPS. The critical service providers that could be impacted are fire and police; water and wastewater utilities; telecommunications providers; medical and nursing facilities, etc. In addition to TID's customer communication protocols, they also work very closely with county and state emergency

management personnel during more significant events that require an emergency operations center activation.

4.8 PUC §8387 (2)(H)

Requirement:

Plans for vegetation management.

Assessment:

Per section 6.4, TID meets or exceeds the minimum industry standard vegetation management practices as defined in CPUC General Order 95 and NERC Standard FAC-003-4. Additionally, TID references and adheres to the requirements in Cal Fire's Powerline Fire Prevention Field Guide. The TID vegetation management program described in their WMP, done primarily by TID contractors and overseen by the TID Line Division Manager, Vegetation Management, is applied to their West Side Fire Zone and East Side Fire Zone (see figures 2 and 3). TID has elected to expand their wildfire mitigation programs to their fire zones which include the CPUC HFTD's and Cal Fire's SRA.

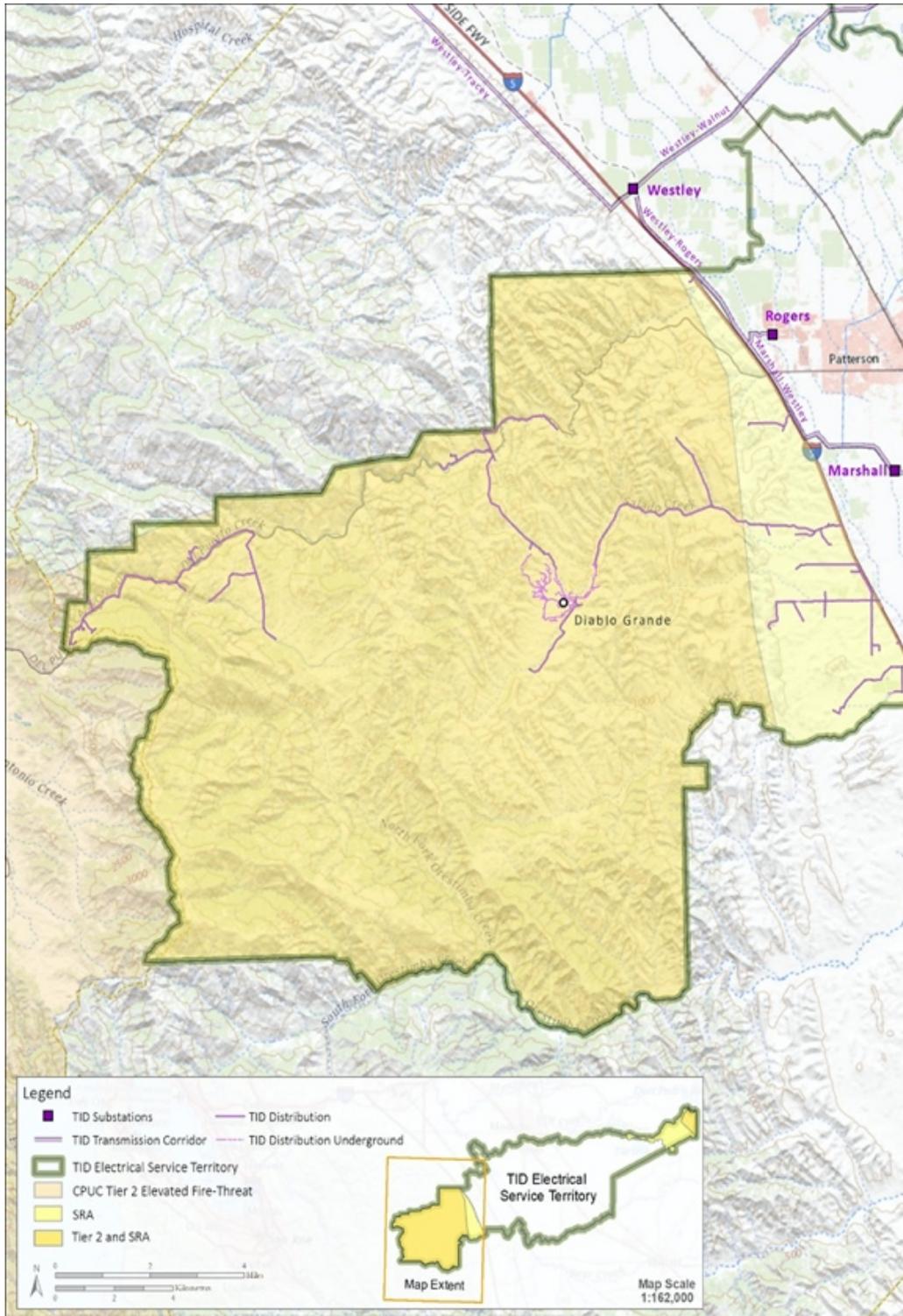


Figure 2 - TID West Side Fire Zone

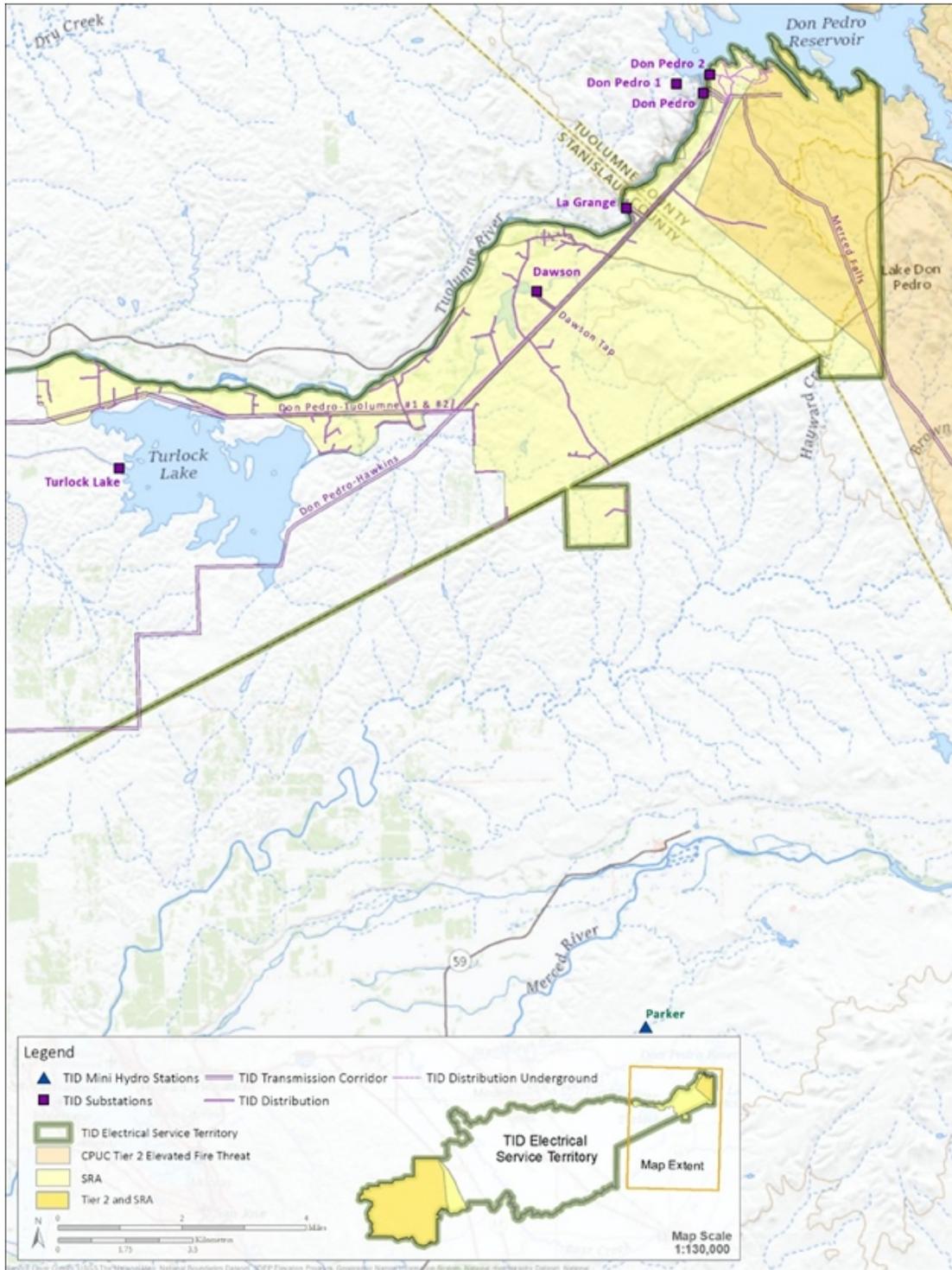


Figure 3 - TID East Side Fire Zone

4.9 PUC §8387 (2)(I)

Requirement:

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

Assessment:

Section 6.5 provides an overview of TID's facility inspection guidelines for facilities within the TID Fire Zones. TID meets or exceeds the minimum inspection standards defined in CPUC General Order 165 for electric distribution and transmission facilities and GO 174 for substations.

4.10 PUC §8387 (2)(J)(i) and (2)(J)(ii)

Requirement:

(2)(J)(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.

(2)(J)(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.

Assessment:

TID's primary risk drivers for a wildfire ignition from electrical facilities are (1) vegetation contact with power lines, (2) wire to wire contact, (3) wire down, and (4) electrical equipment failures. In the absence of documented historical failure rates TID has listed these risk drivers based on experience of their long-term employees.

Less than 10% of TID's electric facilities and 1% of customer meters are within their Fire Zones and pose minimal risk for a catastrophic wildfire. Most of their service territory is in the San Joaquin Valley consisting of flat terrain covered with

crops which are frequently irrigated. A small percentage of the service territory is in the foothills with higher vegetation density than in the valley. Conversely the climatological risk factors are consistent with what is being experienced throughout California. Those risks are associated to (1) extended drought conditions, (2) weather, (3) vegetation type and density, (4) high winds, (5) and climate change.

4.11 PUC §8387 (2)(K)

Requirement:

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.

Assessment:

TID directly participated as a territory lead in the development of the CPUC's Fire-Threat Map which designates the HFTDs. As described in section 6.1, TID agrees with the identified HFTD and has incorporated it into its construction, inspection, maintenance, repair, and clearance practices, where applicable, within its Fire Zones.

TID has not identified any areas of their service territory that are of higher wildfire threat than is identified in the CPUC fire threat map and makes no recommendations for expanding the HFTD's within their service territory.

4.12 PUC §8387 (2)(L)

Requirement:

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

Assessment:

TID is currently developing an Enterprise Risk Management Plan scheduled for completion in 2020. TID has identified four primary wildfire risk drivers which are (1) vegetation contact, (2) wire to wire contact, (3) wire down incidents, and (4) equipment failure. When TID documents historical data (metrics) on failure or incident rates of the four primary risk drivers they will be able to develop and prioritize specific mitigation programs.

4.13 PUC §8387 (2)(M)

Requirement:

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

Assessment:

Section 8.0 describes TID's procedures for restoring electrical service following an unplanned (forced) interruption, after a wildfire, and/or following a PSPS. TID has well-defined standard operating procedures for restoring service following an interruption. If there is an interruption of service for any reason, during critical fire weather conditions, TID will conduct a full patrol of their facilities to ensure no damage prior to restoring service.

4.14 PUC §8387 (2)(N)(i) and (2)(N)(ii) and 2(N)(iii)

Requirement:

(2)(N)(i) Monitor and audit the implementation of the wildfire mitigation plan.

(2)(N)(ii) Identify any deficiencies in the wildfire mitigation plan or its implementation and correct those deficiencies.

2(N)(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.

Assessment:

TID provides a comprehensive list of leadership responsible for ensuring compliance with TID's wildfire mitigation programs. Although the General Manager has overall accountability for the development and implementation of the Plan, all specific program responsibilities are delegated to leadership overseeing their respective departments.

Per section 9.2, TID will track seven separate metrics to determine plan effectiveness including identifying plan deficiencies. The metrics provided in TID's 2019 WMP will serve as the baseline year to assess Plan performance and as the basis for plan revisions and improvements in future years.

5.0 Summary

TID's goal is to comply with California SB 901, PUC §8387, and to operate its electrical lines and equipment in a manner that will minimize the risk of wildfire posed by those electrical lines and equipment. Following an independent evaluation of TID's WMP, GridSME concludes TID's Plan is comprehensive and meets the requirements of PUC §8387.