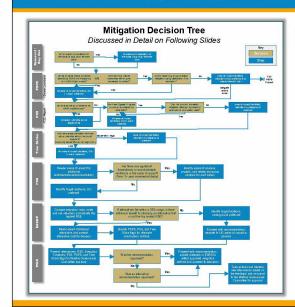
# Wildfire Risk Governance Committee System Hardening Project Approvals

January 28, 2021

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# To streamline the approval process, the System Hardening Team has developed a decision tree to help guide mitigation selection



# System Hardening Decision Tree

### Objective:

Streamline the mitigation level approvals for system hardening by setting bounds on which projects come before the committee for approval

### **Decision Tree in Action:**

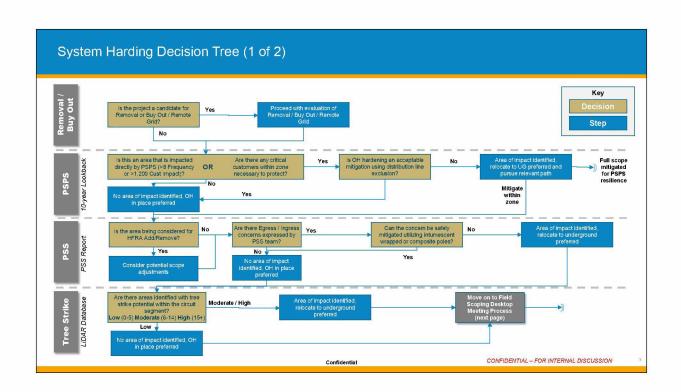
- ☐ System Hardening Team will leverage the decision tree in all mitigation scoping discussions
- Any jobs clearly defined by the decision tree logic will come to the committee as an inform
- All jobs which are "on the edge" or require exceptions to the decision tree will be brought to the committee for approval

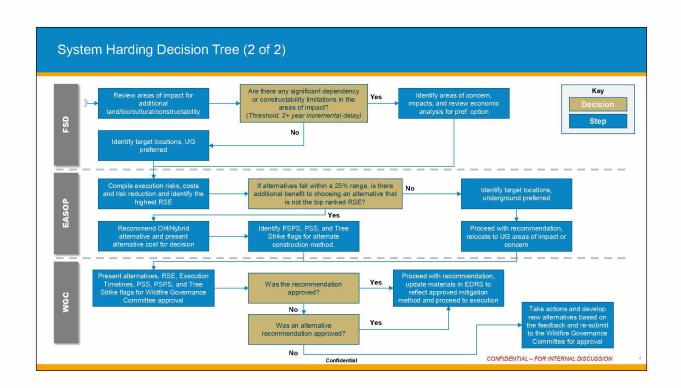
## **Decision Tree Approval**

Team will request approval after demonstrating with tonight's projects

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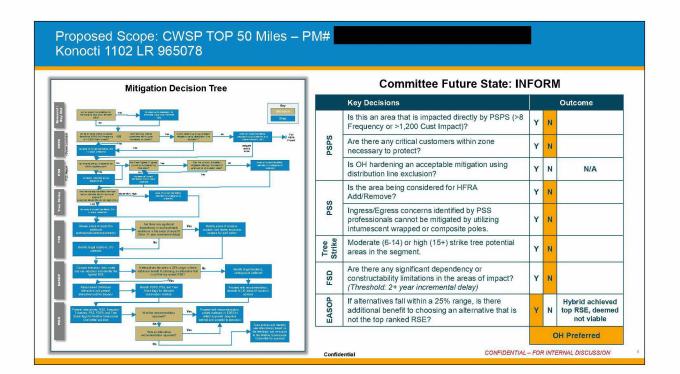
# The decision tree will be stress tested using the following mitigation level project approvals

# The following 6 projects are for discussion today:

			T	Total MAVF Core	Mean MAVF Core		
	Order No.	CPZ	Work Bucket	Risk Value	Risk Rank	Recommendation	1/28 Approval
1		KONOCTI 1102965078	CWSP – Top 50	51.70	9	ОН	PENDING
2		LAS GALLINAS A 110599904	ECOP	13.50	215	UG	PENDING
3		SILVERADO 2104726	ECOP	58.77	279	Hybrid (OH/UG)	PENDING
4		CLAYTON 221296224	ECOP	32.63	377	Hybrid (OH/UG)	PENDING
5		Volta 110149742	CWSP - Top 250	13	39	ОН	PENDING
6		Bucks Creek	CWSP - Top 50	9.55	11	Hybrid (OH/UG)	PENDING

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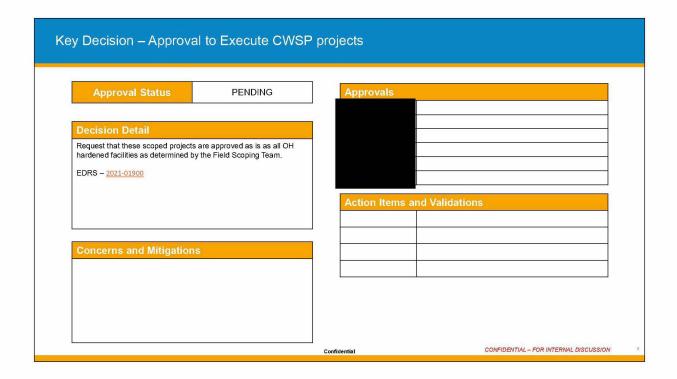


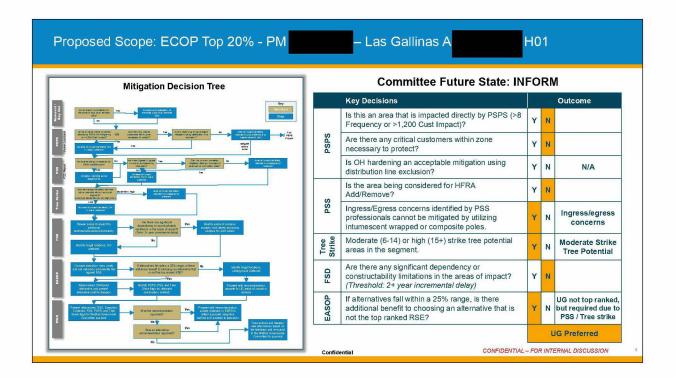
# Proposed Scope: CWSP TOP 50 Miles – PM# Konocti 1102 LR 965078

	Konocti 1102 (2.53 Miles)	No System Hardening	Overhead Hardening	Under-grounding	Hybrid
	Project Scope Risk Reduced After Mitigation	-	12.93	20.65	14.03
	Project Scope Residual Risk Value	20.86	7.93	.21	6.83
	Overall Miles Installed	2.53	2.53	2.78	2.32
	OH System Hardening Cost (\$2.5M/risk-mile mitigated)	-			
	UG System Hardening Cost (\$8.8M/risk-mile mitigated)	-			
	Line Removal Cost	-			
	Total Capital Cost (AACE Class 5)				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
Primary Filter	\$ NPV per unit of risk (RSE)	-			
Primary Filter	PSS Preference (Ingress/egress/fire history)	Not-Preferred	Satisfactory	Satisfactory	Satisfactory
	Strike Tree Potential	Moderate Fall-In Risk	Low Fall-In Tree Risk	N/A	Low Fall-In Tree Risk
Secondary	Ingress / Egress	LOW	Satisfactory	Satisfactory	Satisfactory
	PSPS Mitigation (42 customers)	42 / 42 (0%)	42 / 42 (0%)	42 / 42 (0%)	42 / 42 (0%)
Filter	Execution timeline (2021, 2022, 2022+)	-	2021	2022+	2022+
	Other (Operational Considerations, etc.)	-		-	Path deemed not viable
			Recommended		

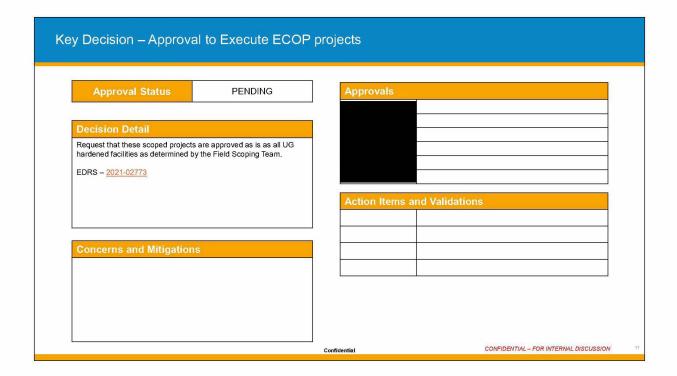
### Supporting Detail for Recommended Alternative (EDRS Link 2021-01900):

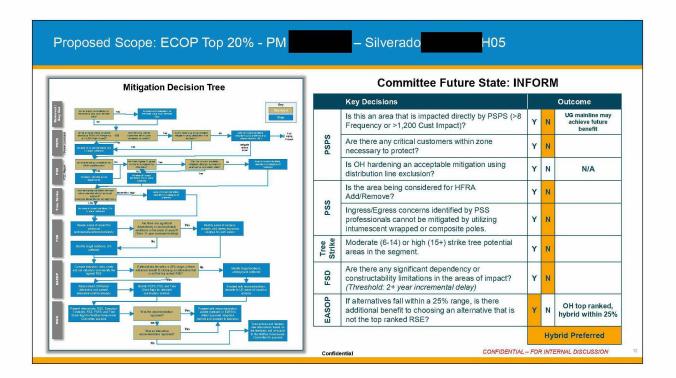
- Public Safety Specialist: Fuel types for project area consist of grassy oak woodland intermixed with heavy brush with patches of gray pine conifer. Fuel loading can range from light to heavy throughout the surrounding area. This project has a significant number of agricultural plots with grape vineyards and other produce in the surrounding area. Population density for this area would be considered low however there are several small communities within a 2-mile radius of the project site.
- Strike Tree Potential: 76 total strike potential trees in the CPZ, LOW (0-5) tree strike potential in this segment does not suggest UG hardening is required.
- Egress Considerations: No major egress concern
- PSPS Mitigation: No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. To achieve PSPS reductions, additional scope would have to be included
- Execution Timeline (Land/Bio/Cultural/Constructability): Work required during the dry season (May 15 Oct 15) and/or biomonitoring. No mitigation expenses expected as long as work is within the road ROW.



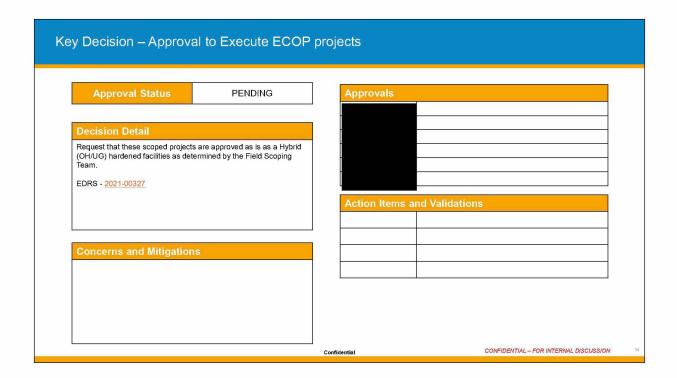


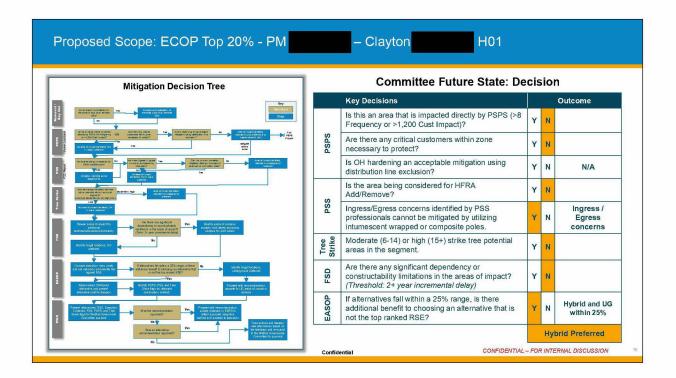
### Proposed Scope: ECOP Top 20% - PM - Las Gallinas A H01 Las Gallinas A 1105 (2.15 Miles) No System Hardening Project Scope Risk Reduced After Mitigation 5.11 Project Scope Residual Risk Value 5.16 1.96 0.05 0.48 Overall Miles Installed 3.15 OH System Hardening Cost (\$1.9M/mile) UG System Hardening Cost (\$6.6M/mile) Line Removal Cost **Total Capital Cost** Average O&M Cost (per year) NPV @ 6.8% discount rate \$ NPV per unit of risk (RSE) **Primary Filter** PSS Preference (Ingress/egress/fire history) Not Preferred Not Satisfactory Preferred Satisfactory High Fall-in Risk Moderate Fall-in Risk Moderate Fall-in Risk Strike Tree Potential Preferred Secondary Egress - Preferred option Not Satisfactory Moderate Preferred Satisfactory Filter PSPS Mitigation (57 customers) 57 / 57 (0%) 57 / 57 (0%) 57 / 57 (0%) 57 / 57 (0%) Execution timeline (2021, 2022, 2022+) 2021 2022+ 2022+ Supporting Detail for Recommended Alternative (EDRS Link 2021-02773): • Public Safety Specialist: Surrounded by grass oak woodland, and brush, intermixed with different varieties of coastal pine and fir trees. Population density is low. The area around this project has no significant fire history. Preference for action to be taken based on increased risk of ignition on tagged equipment. • Strike Tree Potential: 359 total strike potential trees in the CPZ, MEDIUM (6-15) tree strike potential in this segment. • Egress Considerations: Lucas Valley road is a main east and west road between Santa Venetia and Nicasio Valley road. PSPS Mitigation: No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. To achieve PSPS reductions, additional scope would have to be included. • Execution Timeline (Land/Bio/Cultural/Constructability): Overhead hardening could be accomplished by 12/31/2021; 1 mile of CA red-legged frog habitat; Pre-activity survey for cultural constraints (more significant impact for UG options); UG options include additional cost for easements, soil conditions, and expected big risk



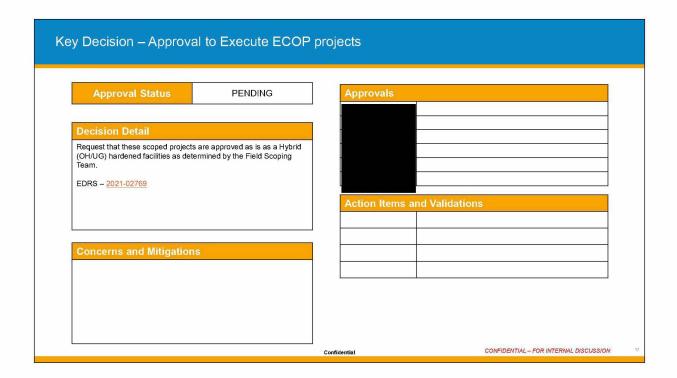


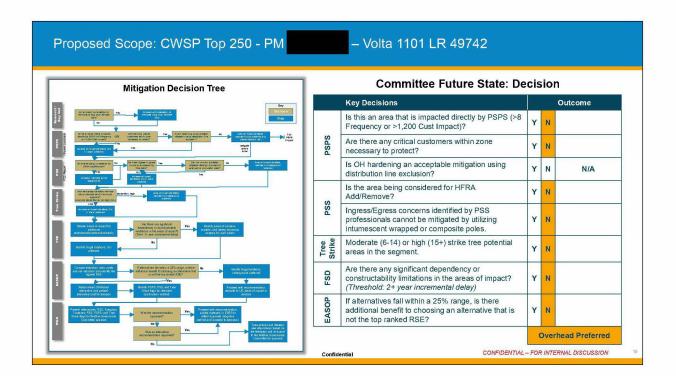
#### Proposed Scope: ECOP Top 20% - PM - Silverado H05 No System Hardening Silverado 2104 (6.85 Miles) Project Scope Risk Reduced After Mitigation 8.20 13.09 11.32 Project Scope Residual Risk Value 13.22 5.02 0.13 1.90 10.79 9.56 Overall Miles Installed 6.85 6.85 OH System Hardening Cost (\$1.8M/mile mitigated) UG System Hardening Cost (\$8.3M/mile mitigated) Line Removal Cost Total Capital Cost (AACE Class 5) Average O&M Cost (per year) NPV @ 6.8% discount rate Primary Filter \$ NPV per unit of risk (RSE) PSS Preference (Ingress/egress/fire history) Not Preferred Satisfactory Satisfactory Satisfactory Moderate Fall-in Risk Strike Tree Potential Low Fall-in Risk Low-Fall-in Risk Ingress / Egress Moderate Satisfactory Satisfactory Satisfactory Secondary PSPS Mitigation (349 Customers) 698 / 698 (0%) 698 / 698 (0%) 698 / 698 (0%) 698 / 698 (0%) Execution timeline (2021, 2022, 2022+) 2021 2022+ 2022+ Other (Operational Considerations, etc.) Supporting Detail for Recommended Alternative (EDRS Link 2021-00327): Public Safety Specialist: Agricultural land & intermixed grass-oak woodland and some small pockets of brush. Population density is low. The area around this project has significant fire history, but not at the project site. Preference for action to be taken based on increased risk of ignition on tagged equipment. • Strike Tree Potential: 828 total strike potential trees in the CPZ, LOW (0-5) tree strike potential in this segment does not suggest UG hardening is required. • Egress Considerations: Pope Valley Road is the main road into and out of the area for both civilians and first responders. The road needs to stay open during an emergency incident due to the loss would stop all traffic in either direction. • PSPS Mitigation: No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. Undergrounding mainline with Hybrid allows for future PSPS benefits. To achieve PSPS reductions now, additional scope would have to be included • Execution Timeline (Land/Bio/Cultural/Constructability): Overhead hardening could be accomplished by 12/31/2021; Private road on extensively overland route which Will require up to 32 separate easements and cross country through vineyards and creeks; Environmental considerations include frog habitat, pond turtle, and stream crossings.





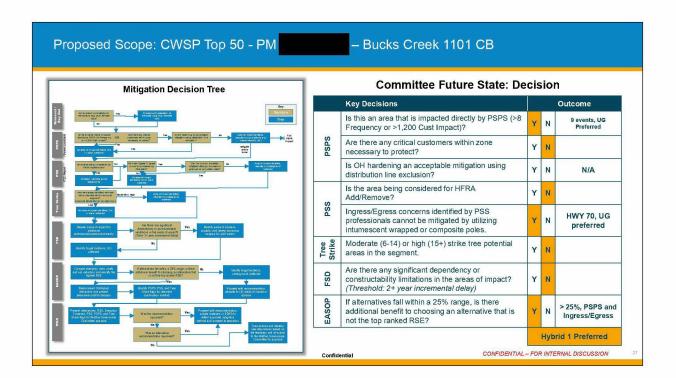
#### Proposed Scope: ECOP Top 20% - PM Claytor H01 Project Scope Risk Reduced After Mitigation 1.48 2.36 1.99 Project Scope Residual Risk Value 2.39 0.03 0.40 Overall Miles Installed 3.15 2.82 1.42 OH System Hardening Cost (\$1.8M/mile) UG System Hardening Cost (\$8.2M/mile) Line Removal Cost **Total Capital Cost** Average O&M Cost (per year) NPV @ 6.8% discount rate \$ NPV per unit of risk (RSE) **Primary Filter** Satisfactory Satisfactory PSS Preference (Ingress/egress/fire history) Preferred Not Preferred Strike Tree Potential Moderate Fall-in Risk Low Fall-in Risk N/A Low Fall-in Risk Ingress/Egress - Preferred option Moderate Not Preferred Preferred Satisfactory Filter PSPS Mitigation (26 Customers) 26 / 26 (0%) 26 / 26 (0%) 26 / 26 (0%) 26 / 26 (0%) Execution timeline (2021, 2022, 2022+) 2021 2022+ 2022+ Supporting Detail for Recommended Alternative (EDRS Routing 2021-02769): Public Safety Specialist: Surrounded by grass oak. Population density is low. The area around this project has some fire history. Preference for action to be taken based on increased risk of ignition on tagged equipment. Strike Tree Potential: 636 total strike potential trees in the CPZ, LOW (0-5) tree strike potential in this segment does not suggest UG hardening is required. • Egress Considerations: This road is not a main thoroughfare on a daily basis but is a route of egress for citizens from the Clayton Valley area when fire impacts the Clayton Valley area. The ${\sf road}$ is used for ingress for fire and emergency services from the south. • PSPS Mittigation: No mittigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. To achieve PSPS reductions, additional scope would • Execution Timeline (Land/Bio/Cultural/Constructability): OH hardening could be accomplished by 12/31/2021; 1.2 miles of CA red-legged frog habitat, CA tiger salamander, and Alameda Whipsnake; Pre-activity survey for cultural constraints (more significant impact for UG options); UG options include additional cost for easements, soil conditions, & expected bio risk.





### Proposed Scope: CWSP TOP 250 - PM# Volta 1101 LR 49742 Overhead Hardening No System Hardening Project Scope Risk Reduced After Mitigation 8.06 12.87 10.79 13 Project Scope Residual Risk Value 4.94 0.13 2.21 Overall Miles Installed 3.55 3.55 6.66 5.29 OH System Hardening Cost (\$1.9M/risk-mile mitigated) UG System Hardening Cost (\$6.2M/risk-mile mitigated) Line Removal Cost Total Capital Cost (AACE Class 5) Average O&M Cost (per year) NPV @ 6.8% discount rate Primary Filter \$ NPV per unit of risk (RSE) Satisfactory PSS Preference (Ingress/egress/fire history) Low Fall-In Risk Low Fall-In Risk Low Fall-In Risk Strike Tree Potential N/A LOW Satisfactory Ingress / Egress Satisfactory Secondary PSPS Mitigation (19 customers) 38 / 38 (0%) 38 / 38 (0%) 38 / 38 (0%) 38 / 38 (0%) Filter Execution timeline (2021, 2022, 2022+) 2021 2022+ 2022+ Other (Operational Considerations, etc.) Supporting Detail for Recommended Alternative (EDRS Link 2021-03779): • Public Safety Specialist: Fuel types are consistent with mainly grass/oak woodland, brush, and intermixed patches of conifers/Gray Pints. Area has a significant fire history but not directly in the project footprint but shows the ability of the area fuels to resist containment and become a major fire. • Strike Tree Potential: 2 total strike potential trees in the CPZ, LOW (0-5) tree strike potential in this segment does not suggest UG hardening is required. Tx under-build for most of job. • Egress Considerations: Evacuees have multiple ways out of the area, depending on the location of the fire. 1st responders will have 2 access roads. • PSPS Mitigation: No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. To achieve PSPS reductions, additional scope would have to be included. 2 PSPS operations in 10-year lookback. • Execution Timeline (Land/Bio/Cultural/Constructability): Work required during the dry season (May 15 – Oct 15) and/or biomonitoring, Mitigation expenses should be considered for ground disturbance. Potential permitting for multiple waterways. Tribal monitoring may be required. Cultural resources work and reporting may need be required, 1-2 days of SME time.

Key Decision – Approval t	to Execute CWSP	Top 250 projects	
Approval Status	PENDING	Approvals	
Decision Detail			
Request that these scoped projects are hardened facilities as determined by th EDRS – 2021-03779		Action Items a	nd Validations
		Decision Framework	Establish clear decision criteria for the WFRG make a decision upon system hardening mitigation alternatives proposed - COMPLETE
Concerns and Mitigations			



### Proposed Scope: CWSP TOP 50 - PM# Bucks Creek 1101 CB Project Scope Risk Reduced After Mitigation 4 73 4 99 4.02 9.55 Project Scope Residual Risk Value 3.63 0.13 0.61 Overall Miles Installed 4.73 OH System Hardening Cost (\$2.8M/risk-mile mitigated) UG System Hardening Cost (\$4.4M/risk-mile mitigated) Line Removal Cost (\$0.106M/risk-mile mitigated) Total Capital Cost (AACE Class 5) Average O&M Cost (per year) NPV @ 6.8% discount rate Primary Filter \$ NPV per unit of risk (RSE) Non-satisfactory Satisfactory Non-satisfactory PSS Preference (Ingress/egress/fire history) Moderate Fall-In Risk Low Fall-In Tree Risk Strike Tree Potential Low Fall-In Tree Risk Low Fall-In Tree Risk Ingress / Egress Moderate Non-satisfactory Satisfactory Non-satisfactory Secondary PSPS Mitigation (5 customers) 45 / 45 (0%) 45 / 45 (0%) 45 / 45 (0%) 45 / 45 (0%) Filter Execution timeline (2021, 2022, 2022+) 2021 2022+ 2022+ Other (Operational Considerations, etc.) Supporting Detail for Recommended Alternative (EDRS Link 2021-03744): Public Safety Specialist: Evel types are consistent with moderate to heavy brush and mixed conifer, however the general area has been heavily fire scared and the fire scar areas are intermixed with a significant amount of standing and down dead fuel. Strike Tree Potential: 105 closal strike potential trees in the CPZ, Moderate (6-15) tree strike potential. Egress Considerations: This project crosses HW 70 near the Bucks Creek Powerhouse and then parallels the highway for a roughly 2-mile stretch, and then runs along Storrie Rd. paralleling the Feather River on the canyon opposite side of Highway 70. HW 70 is a main thoroughfare for ingress/egress for emergency responders and to the few residents who live in that direct area; it is also a major route for commerce both by which ear drain and the fire scar area area would make ingress and egress difficult if not impossible for responders and citizens and economically be a substantial hit to commerce. There are no alternative routes within the Feather River Canyon. • PSPS Mitigation: No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. Cannot achieve PSPS reduction due to required overhead conductor over the water crossing near the substation. Execution Timeline (Land/Bio/Cultural/Constructability): Work required during the dry season (May 15 – Oct 15) and/or biomonitoring, and potential Heli restrictions (Feb 2 – July 15) due to owl activity centers. CALTRANS ROW, easement restrictions, and 1 culturally sensitive areas in Hybrid 1. Butte work further down HWY 70 is undergrounding line consistent with the Hybrid 1 alternative.

Key Decision – Approval to	Execute CWSP	Top 250 projects	
Approval Status	PENDING	Approvals	
<b>Decision Detail</b>			
Request that these scoped projects are approved as is as all OH hardened facilities as determined by the Field Scoping Team.  EDRS – 2021-03744		Action Items a	nd Validations
		Decision Framework	Establish clear decision criteria for the WFRG make a decision upon system hardening mitigation alternatives proposed - COMPLETE
Concerns and Mitigations			

Key Decision – Approval	of System Hardeni	ng Decision Tree
Approval Status	PENDING	Approvals
Decision Detail		
Request that the System Hardening Distreamline the mitigation approval prodecision include:  System Hardening Team will leverage mitigation scoping discussions  Any jobs clearly defined by the decicommittee as an inform  All jobs which are "on the edge" or redecision tree will be brought to the committee as an inform.	ess. Key tenets of the  ge the decision tree in all  sion tree logic will come to the  equire exceptions to the	Action Items and Validations
Concerns and Mitigations		
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