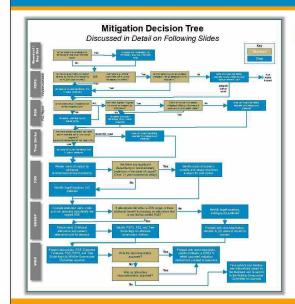
Wildfire Risk Governance Committee System Hardening Project Approvals

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:

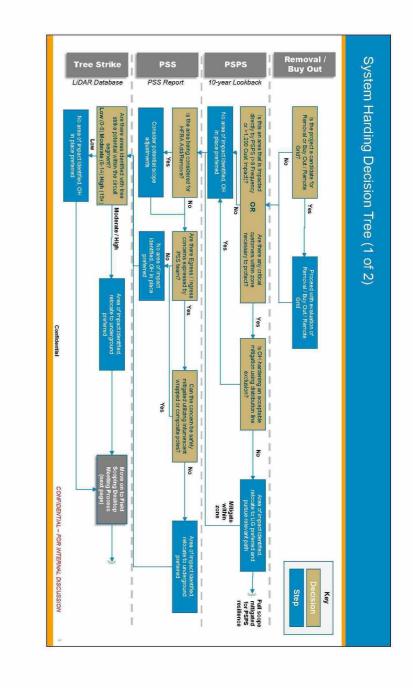
- ☐ System Hardening Team will leverage the decision tree in all mitigation scoping discussions
- □ Any jobs clearly defined by the decision tree logic will come to the committee as an inform
- □ All jobs which are "on the edge" or require exceptions to the decision tree will be brought to the committee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

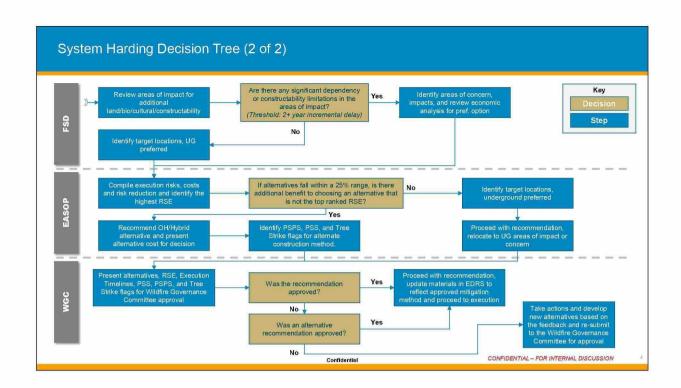
Decision Tree Approval

Team will request approval after demonstrating with tonight's projects

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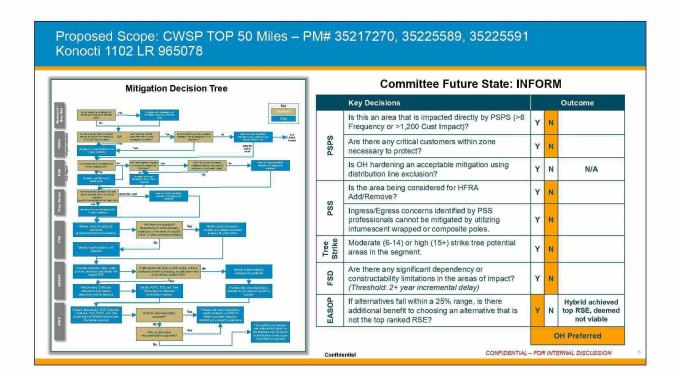
The decision tree will be stress tested using the following mitigation level project approvals

The following 6 projects are for discussion today:

	Order No.	CPZ	Work Bucket	Total MAVF Core Risk Value	Mean MAVF Core Risk Rank	Recommendation	1/28 Approval
1	35217270	KONOCTI 1102965078	CWSP - Top 50	51.70	9	ОН	PENDING
2	35191319	LAS GALLINAS A 110599904	ECOP	13.50	215	UG	PENDING
3	35192284	SILVERADO 2104726	ECOP	58.77	279	Hybrid (OH/UG)	PENDING
4	35192280	CLAYTON 221296224	ECOP	32.63	377	Hybrid (OH/UG)	PENDING
5	35219273	Volta 110149742	CWSP - Top 250	13	39	ОН	PENDING
6	35217268	Bucks Creek 1101CB	CWSP - Top 50	9.55	11	Hybrid (OH/UG)	PENDING

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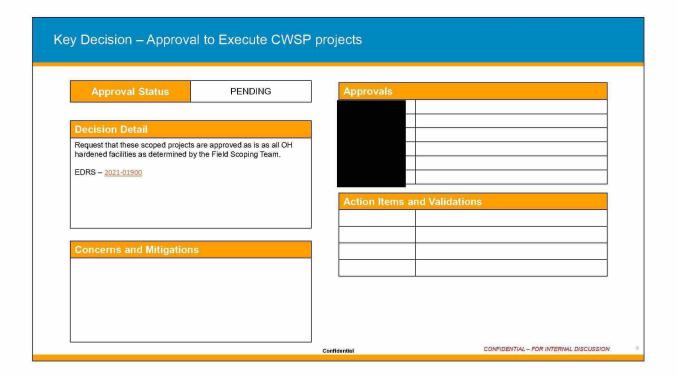


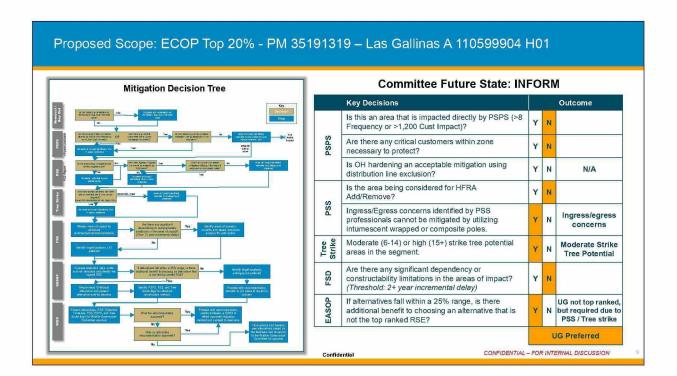
Proposed Scope: CWSP TOP 50 Miles – PM# 35217270, 35225589, 35225591 Konocti 1102 LR 965078

	Konocti 1102 (2.53 Miles)	No System Hardening	Overhead Hardening	Under-grounding	Hybrid
	Project Scope Risk Reduced After Mitigation	Ψ.	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 (risk-mile mitigated)	-			
	UG System Hardening Cost (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
		42 / 42 (0%)	42 / 42 (0%)	42 / 42 (0%)	42 / 42 (0%)
	PSPS Mitigation (42 customers)	42 / 42 (0/0)			
Filter	PSPS Mitigation (42 customers) Execution timeline (2021, 2022, 2022+)	-	2021	2022+	2022+

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.



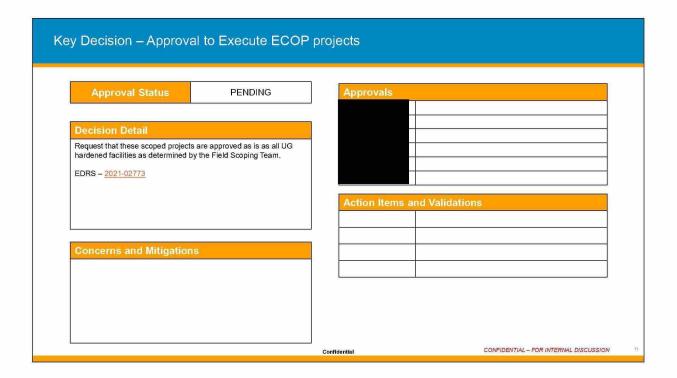


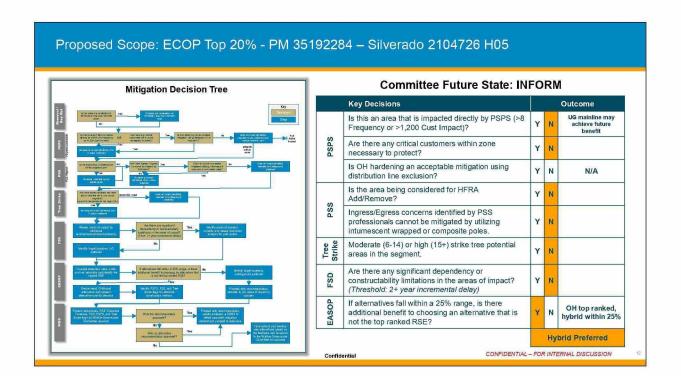
Proposed Scope: ECOP Top 20% - PM 35191319 - Las Gallinas A 110599904 H01

	Las Gallinas A 1105 (2.15 Miles)	No System Hardening	Overhead Hardening	Under-grounding	Hybrid
	Project Scope Risk Reduced After Mitigation		3.20	5.11	4.68
	Project Scope Residual Risk Value	5.16	1.96	0.05	0.48
	Overall Miles Installed		2.15	3.15	2.23
	OH System Hardening Cost	ä			
	UG System Hardening Cost	-			
	Line Removal Cost	-			
	Total Capital Cost				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
Data rile	NPV @ 6.8% discount rate \$ NPV per unit of risk (RSE)				
Primary Filter		- Not Preferred	Not Satisfactory	Preferred	Satisfactory
Primary Filter	\$ NPV per unit of risk (RSE)		Not Satisfactory Moderate Fall-in Risk	Preferred Preferred	
Primary Filter Secondary	\$ NPV per unit of risk (RSE) PSS Preference (Ingress/egress/fire history)	Not Preferred		100,000,000	Satisfactory Moderate Fall-in Risk Satisfactory
11002	\$ NPV per unit of risk (RSE) PSS Preference (Ingress/egress/fire history) Strike Tree Potential	Not Preferred High Fall-in Risk	Moderate Fall-in Risk	Preferred	Moderate Fall-in Risk

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 bio risk.





Proposed Scope: ECOP Top 20% - PM 35192284 - Silverado 2104726 H05

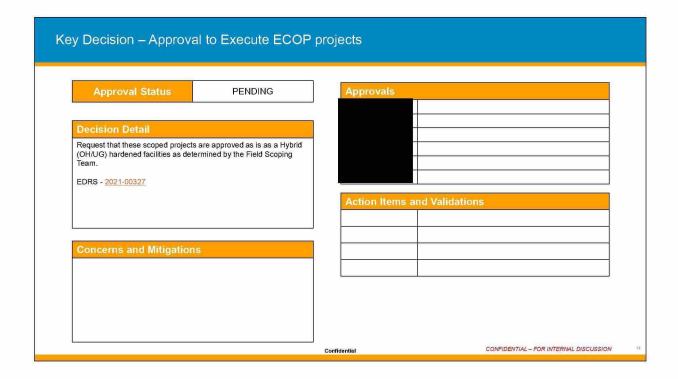
	Silverado 2104 (6.85 Miles)	No System Hardening	Overhead Hardening	Under-grounding	Hybrid
	Project Scope Risk Reduced After Mitigation	<u>;</u>	8.20	13.09	11.32
	Project Scope Residual Risk Value	13.22	5.02	0.13	1.90
	Overall Miles Installed	6.85	6.85	10.79	9.56
	OH System Hardening Cost (mile mitigated)	-			
	UG System Hardening Cost (mile mitigated)	<u>}</u>			
	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 Risk	N/A	Low-Fall-in Risk
Committee	Ingress / Egress	Moderate	Satisfactory	Satisfactory	Satisfactory
Secondary Filter	PSPS Mitigation (349 Customers)	698 / 698 (0%)	698 / 698 (0%)	698 / 698 (0%)	698 / 698 (0%)
riiter	Execution timeline (2021, 2022, 2022+)		2021	2022+	2022+
	Other (Operational Considerations, etc.)	8	(8)	*	19
	15 16 20 16 2				Recommended

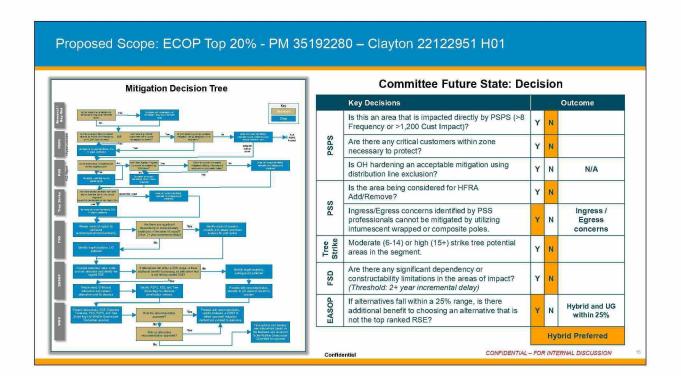
Supporting Detail for Recommended Alternative (EDRS Link 2021-00327):

- 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.

PGE-DIXIE-NDCAL-000001213



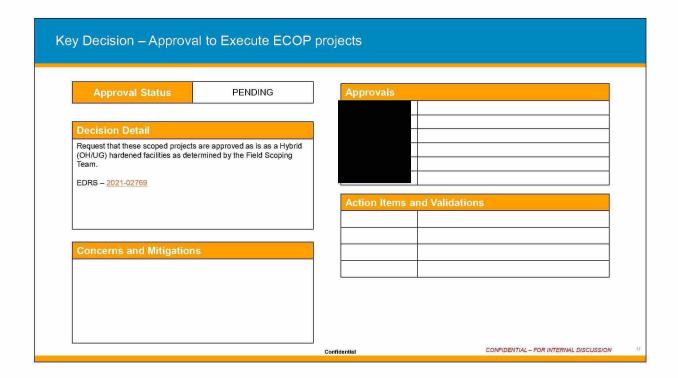


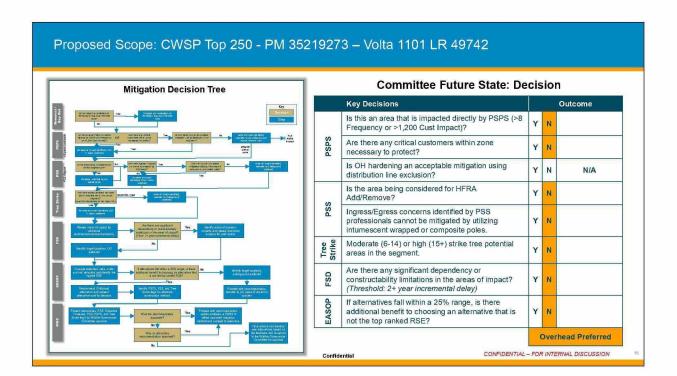
Proposed Scope: ECOP Top 20% - PM 35192280 - Clayton 22122951 H01

Proje Over OH UG Line Total	ect Scope Risk Reduced After Mitigation ect Scope Residual Risk Value rall Miles Installed I System Hardening Cost /mile) System Harden Cost nile) e Removal Cost	2.39	1,48 0.91	2.36 0.03 3.15	1.99 0.40
Over OH UG Lin	rall Miles Installed I System Hardening Cost I System Hardening Cost mile)			100000	
OH UG Lin Total	l System Hardening Cost (mile) System Hardening Cost (mile)	Ž.	1.42	3.15	2.82
UG Line Total	System Hardening Cost managemile)	ä-			
Lin. Total		-			
Total	e Removal Cost				
the second secon		-			
Aver	l Capital Cost				
	rage O&M Cost (per year)				
NPV	@ 6.8% discount rate				
\$ NP	PV per unit of risk (RSE)	*			
rimary Filter PSS	Preference (Ingress/egress/fire history)	Not Preferred	Satisfactory	Preferred	Satisfactory
Strik	ke Tree Potential	Moderate Fall-in Risk	Low Fall-in Risk	N/A	Low Fall-in Risk
Secondary Ingre	ess/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%)
Exec	ution 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 road is used for ingress for fire and emergency services from the south.
- 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): 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# 35219273 Volta 1101 LR 49742

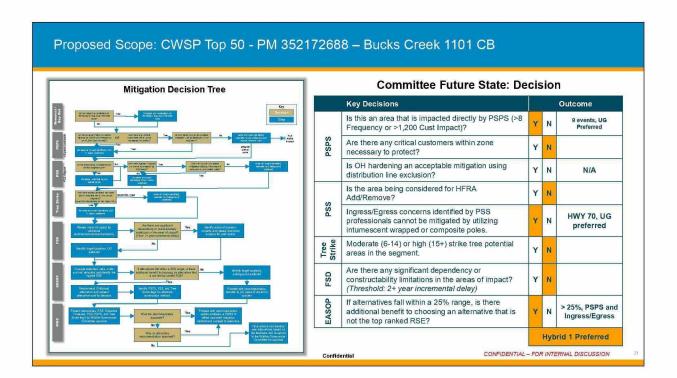
	Volta 1101 (3.55 miles)	No System Hardening	Overhead Hardening	Under-grounding	Hybrid
	Project Scope Risk Reduced After Mitigation		8.06	12.87	10.79
	Project Scope Residual Risk Value	13	4.94	0.13	2.21
	Overall Miles Installed	3.55	3.55	6.66	5.29
	OH System Hardening Cost /risk-mile mitigated)	-			
	UG System Hardening Cost (risk-mile mitigated)	20			
	Line Removal Cost	*:			
	Total Capital Cost (AACE Class 5)				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
D. Constant Prince	\$ NPV per unit of risk (RSE)				
Primary Filter	PSS Preference (Ingress/egress/fire history)		Satisfactory		
	Strike Tree Potential	Low Fall-In Risk	Low Fall-In Risk	N/A	Low Fall-In Risk
	Ingress / Egress	LOW	Satisfactory	Satisfactory	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.)	-			7
			Denominanded		

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. 1th 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.

PGE-DIXIE-NDCAL-000001219

Key Decision – Approval to Execute CV	/SP Top 250 projects
Approval Status PENDING	Approvals
Decision Detail Request that these scoped projects are approved as is as all O hardened facilities as determined by the Field Scoping Team. EDRS – 2021-03779	Action Items and Validations Decision Framework Establish clear decision criteria for the WFRG make a decision upon system hardening mitigation alternatives proposed - COMPLETE
Concerns and Mitigations	Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION 20



Proposed Scope: CWSP TOP 50 - PM# 35217268 Bucks Creek 1101 CB

	Bucks Creek 1101 (4.73 miles)	No System Hardening	Overhead Hardening	Hybrid 1	Hybrid 2
	Project Scope Risk Reduced After Mitigation		4.73	4.99	4.02
	Project Scope Residual Risk Value	9.55	3.63	0.13	0.61
	Overall Miles Installed	4.73	4.73	5.42	4.02
	OH System Hardening Cost	-			
	UG System Hardening Cost	2%			
	Line Removal Cost	**			
	Total Capital Cost (AACE Class 5)				
	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)		Non-satisfactory	Satisfactory	Non-satisfactory
	Strike Tree Potential	Moderate Fall-In Risk	Low Fall-In Tree Risk	Low Fall-In Tree Risk	Low Fall-In Tree Ris
	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+)	2	2021	2022+	2022+
	Other (Operational Considerations, etc.)	-	.=	-	7=

- Supporting Detail for Recommended Alternative (EDRS Link 2021-03744):

 Public Safety Specialist: Fuel 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 total strike potential trees in the CPZ, Moderate (6-15) tree strike potential.

 Figress Considerations: This project crosses HWY 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. HWY 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 welfulce and railroad, if Highway 70 was closed in this area it 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 1	op 250 projects	
Approval Status PENDING	Approvals	
Decision Detail 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 ar	nd Validations Establish clear decision criteria for the WFRG make a decision upon system hardening mitigation alternatives proposed - COMPLETE - COMP
Concerns and Mitigations		
		CONFIDENTIAL – FOR INTERNAL DISCUSSION

Key Decision – Approva	al of System Harden	ing Decision Tree	
Approval Status	PENDING	Approvals	
Decision Detail			
Request that the System Hardening streamline the mitigation approval p decision include: System Hardening Team will leve mitigation scoping discussions Any jobs clearly defined by the d committee as an inform All jobs which are "on the edge" of decision tree will be brought to the	process. Key tenets of the erage the decision tree in all ecision tree logic will come to the or require exceptions to the le committee for approval	Action Items and	Validations
Concerns and Mitigation	S	1	
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