

Wildfire Risk Governance Committee
System Hardening Project Approvals

February 25, 2021

PG&E System Hardening Strategy

Two (2) potential go-forward strategies for System Hardening have been contemplated:

Recommended

1

RSE Optimized Risk Buy-down

Objective: Reduce the most amount of risk possible, informed by the RSE score, within the GRC planning period.

Pros:

- Looks towards the long term as climatic risk is worsening
- Significantly lower residual risk for hardened segments addressed and additional risk reduction benefits (i.e., PSPS, ingress/egress) due to proportion of undergrounding likely

Cons:

- Reduced total miles addressable based on time constraints due to proportion of underground
- Due to operational time requirements of undergrounding, some high risk areas may not be mitigated in the near term and must be addressed by other risk mitigation programs (e.g., EVM)

Confidential

2

Accelerated Risk Buy-down

Objective: Reduce the most amount of overall risk as quickly as possible.

Pros:

- Facilitates risk reduction across the broader service territory (i.e., more miles addressed) based on higher proportion of OH hardening

Cons:

- Residual risk may require "go-backs" with a different mitigation strategy
- Minimal reduction of other risks (e.g., PSPS) not accounted for in current risk modeling

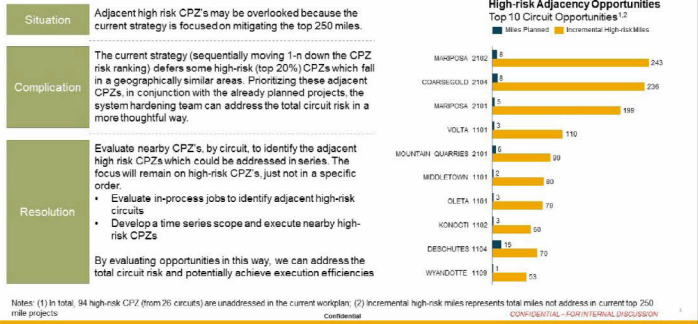
CONFIDENTIAL - FOR INTERNAL DISCUSSION

Key Decision – Approve the PG&E System Hardening Strategy

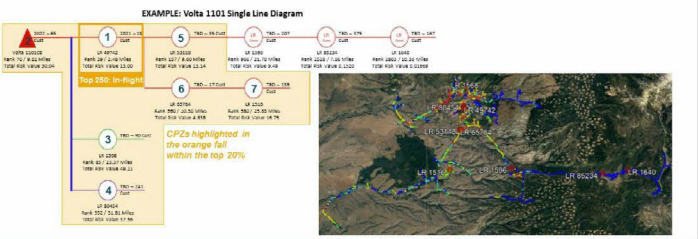
Approval Status	Pending												
Decision Detail	Approvals												
Approval of the recommended PG&E System Hardening Strategy. <input type="checkbox"/> Option 1: Reduce the most amount of risk possible, informed by the RSE score, within the GRC planning period.	<table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>												
Concerns and Mitigations	Action Items and Validations												
	<table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>												

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

System Hardening can target the riskiest 250 miles, while executing a multi-year plan to address adjacent high risk (top 20%) CPZs within the circuit

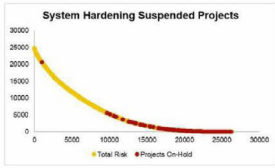


Illustrative: Approved project for Volta 110149742 sits on a circuit with six (6) other CPZs that fall within the top 20%



There is an opportunity to maximize risk reduction from "on-hold" jobs where PG&E has already expended resources to scope and estimate

- Situation** Based on the updated 2021 risk model, a significant quantity of scoped / estimated work has been placed on hold to prioritize higher risk segments.
- Complication** Certain segments of these on-hold projects contain higher risk segments (equivalent to the top 20% MAVF), even though the entire CPZ does not meet the top 20% threshold. These segments of CPZs can be surgically targeted for system hardening in the highest risk locations to accelerate risk buy-down and achieve greater mileage in the near term.
- Resolution** Evaluate the on-hold project list to identify high risk segments for targeted mitigation:
 - Review project locations overlaid with risk scores
 - Establish risk threshold for targeted mitigation (Recommended threshold is 0.1055—equivalent to top 20% Mean MAVF score)
 - Refine scope / estimates to address only the highest risk portions of the project
 This strategy will maximize risk reduction in areas which have already expended resources in estimating / scoping and accelerate mileage capture in the near term

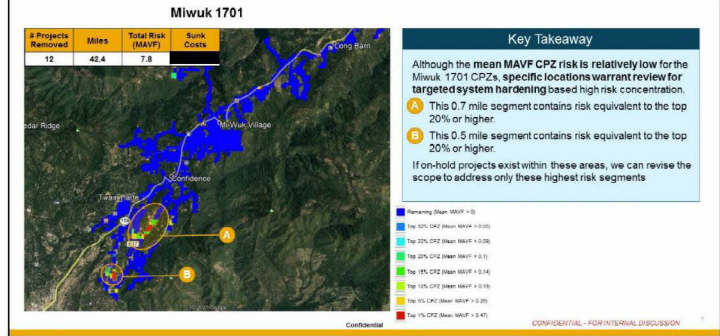


# Projects Removed	Miles	On-hold Project Risk (MAVF)	Sunk Costs
478	1,384	1,104	

Represents on-hold projects as of 1.13.2021

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

Illustrative: Miwuk 1701 has no CPZs that fall within the high-risk category (top 20%), however revisions to "on-hold" projects might be able to address targeted areas of risk



Key Decision – Approval to Expand Scope Prioritization and Approve Overarching System Hardening Strategy

Approval Status Pending

Decision Detail

Seeking approval to expand the System Hardening Targeting Strategy to include:

- The top 20% riskiest CPZs in circuits where projects are already being scoped
- High risk sub-segments of the on-hold projects, which have equivalent risk scores to the top 20% CPZs

Concerns and Mitigations

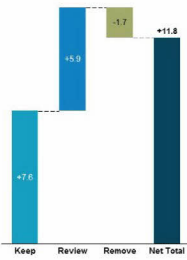
Approvals

Action Items and Validations

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

Request to reconsider specific in-construction projects from the on-hold project list and remove from some approved project list (net impact of +11.8 miles)

Workplan Change Request Summary



Request to Keep (7.6 mi)

Add back projects which were previously placed on-hold based on work expended:

- In Construction (work started), missed during initial inventory of in construction work – 2 jobs, 3.2mi
- In construction (not started), significant effort to secure permit and relationships at risk – 1 job, 0.5mi
- In construction would that would complete an upstream mainline – 1 job, 1.6mi
- Pending, significant permitting effort which could damage relationships if not executed – 3 jobs, 2.4mi

Request to Review (5.9 mi)

Confirm the decision to place projects on-hold given efforts expended and other factors:

- Pending, Significant effort expended to secure easements – 1 job, 3.35mi
- Pending, Significant effort expended to secure permit – 1 job, 1.1mi
- Pending, Completes a mainline for previously executed phases – 1 job, 1.5mi

Request to Remove (1.7 mi)

Remove from existing project list based on dependencies identified:

- Review of land requirements will require project redesign or imminent domain – 1 job, 1.7mi

- Project level details on following slide -

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION

Workplan change request details - 11 projects added (13.5 mi) and 2 projects removed (3.3 mi)

Order	Miles	Project	Risk Rank	Rationale/Details
Proposed to Keep	1.44	CWSP-PINE GROVE 1102 - R1222 PH 2.0	2,521 (61%)	Significant progress; 15 poles installed
	1.75	CWSP-STANISLAUS 1702-LR1888-PH 1.2	2,386 (60%)	Significant progress; 56 poles installed and SAP issues keeping project at UNSE status
	0.45	RECON 2280 FT - NUNS CANYON - DUNBAR 1101	1,794 (45%)	Permit; Required several years of discussion with the CDFW and messaging that the work is critical to the wildfire plan. PERM also developed a mitigation plan and will be on the hook for implementing it regardless of whether or not this project moves forward
	1.57	CWSP-BRUNSWICK 1103-LR0070-PH 2.3	2,141 (53%)	Completes CPZ; Phase 2 of 3 of system hardening work in the CPZ. Other phases have been approved for construction (Phases 1&2 are 75% complete)
	0.51	RECON-6 SPANS CAMP ONE 11N MILE 11 BRAGG	2,340 (58%)	Permit; Anticipate coastal developed permit approval in early 2021, which took 2 years to obtain. Public hearing and emergency statutory exemption under CEQA already.
	1.00	OH RECONDUCTOR ROW ROY 2219 - 902KCL17	3,282 (80%)	Permit; Applied for Coastal Development Permit with the Santa Cruz County and have been working with them for a the last year. Permits expected by 11/21/21, and anticipate severe detriment to relationships with CD' W and Santa Cruz if project is cancelled.
Proposed to Remove	1.75	CWSP-STANISLAUS 1702-LR1888-PH 2.2	2,386 (60%)	Easement; 3 of 4 easements acquired. [REDACTED] and 4th easement underway [REDACTED]
	1.40	PSPS - Clayton 2215 - CB	1,719 (43%)	Easement; 8 easements accepted or nearing acceptance
	1.06	HALF MOON BAY 1102 - FUCO 12457 REPL OH	2,874 (72%)	Permit; SGNRA permit received which took 2 years to acquire
	1.53	CWSP-MIWUK 1702-LR6018-PH 1.1	2,217 (55%)	Completes Mainline; Finalize mainline hardening completed on either side via other projects
Remove	(1.72)	CWSP-MIWUK 1701 - CLB-PH 1.3	2,353 (58%)	Issue identified; location moved during land review that will require redesign of the project or imminent domain. Have been pursuing land rights since summer of 2020.

Note: Full notes from project management team available in appendix

Confidential

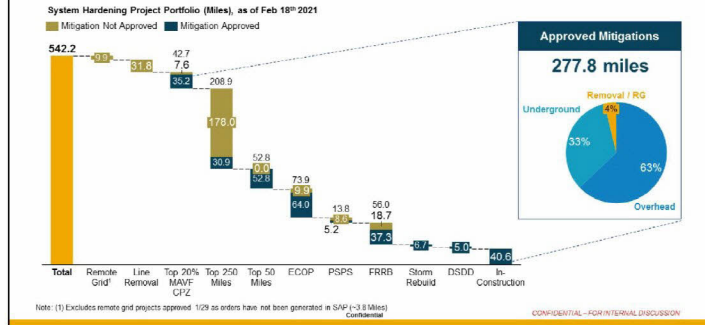
CONFIDENTIAL - FOR INTERNAL DISCUSSION

Key Decision – Approval of workplan change request

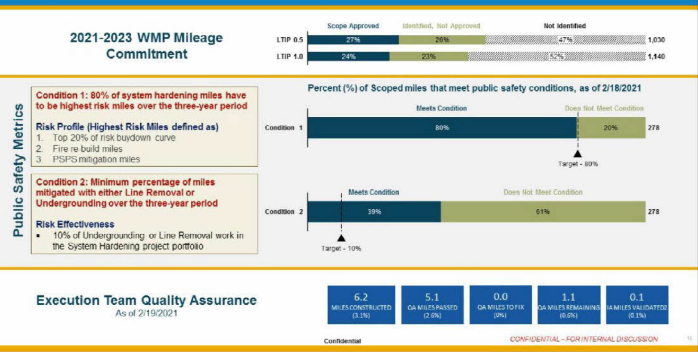
Approval Status	Pending																				
Decision Detail	Approvals																				
Seeking approval / confirmation of on-hold projects which have been placed on hold at request of this committee in light of additional information shared: <input type="checkbox"/> ADD 7 projects for 7.6 miles <input type="checkbox"/> CUMULATIVE 4 projects for 5.9 miles Removed projects which no longer make sense based on new information / other projects which have been placed on hold. <input type="checkbox"/> REMOVE 1 project for 1.7 miles	<table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>																				
Concerns and Mitigations	Action Items and Validations																				
	<table border="1"><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>																				

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

System Hardening Status – Total Portfolio And Approved Mitigations



System Hardening Status – Progress Towards WMP Commitments and Public Safety Metrics



Today's discussion will include various mitigation recommendations for decision and inform (25.3 miles total)

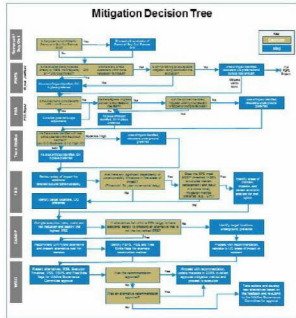
The following projects have recommended mitigations:

Order No.	CPZ	Work Bucket	Total MAVF Core Risk Value	Mean MAVF Core Risk Rank	Recommendation	WGC Request
WGC Decision (7.83 miles)						
1	Wildwood 11011454	Top 250 Miles	0.4188	52	OH	DECISION
WGC Inform (17.45 miles)						
2	Middletown 11011548	E.GDP - Top 20%	0.1594	474	HYBRID	INFORM
3	Brunswick 1110CB	PSPS	0.0064	2134	UG	INFORM
4	Placerville 21061104	REMG	0.0064	2131	REMOTE GRID	INFORM
5	Mountain Quarries 21016963	Top 250 miles	0.4353	45	HYBRID	INFORM
6	Bangor 1101CB	PSPS	0.1938	355	UG	INFORM

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION

Decision: Top 50 Miles - Wildwood 1101 - LR 1454 - PM (7.83 Miles)



	Key Questions	Outcome
PSPS	Is this an area that is impacted directly by PSPS (-8 Frequency or >1,200 Cust Impact)?	Y N 1 event, 18 Cust Impact
	Are there any critical customers within zone necessary to protect?	Y N
PSS	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y N N/A
	Is the area being considered for HFRA Add/Remove?	Y N
Tree Strike	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y N
	Moderate (8-14) or High (15+) strike tree potential areas in the segment.	Y N 3 spans Moderate
FSD	Are there any significant dependency or constructability limitations in the areas of impact? (Threshold: 2+ year incremental delay)	Y N Gas T-tees, overhead rewire, significant relocation
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y N
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y N OH Preferred

Confidential

CONFIDENTIAL - PROPRIETARY INFORMATION

Decision: Top 50 Miles - Wildwood 1101 - LR 1454 - PM (7.83 Miles)

Wildwood 1101 (7.83 miles)		No System Hardening	Overhead Hardening	Under-Grounding	Hybrid
Project Scope Risk Reduced After Mitigation		-	8.05	17.85	10.10
Project Scope Residual Risk Value		12.98	4.93	0.13	2.86
Overall Miles Installed		7.83 Existing OH	7.83	9.64	9.94
Overall Miles Removed		-	-	-	-
OH System Hardening Cost		1.6k/mile	-	-	-
UG System Hardening Cost		-	-	-	-
Line Removal Cost		1.8k/mile	-	-	-
Total Capital Cost (\$&C 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)		Satisfactory	Satisfactory	Satisfactory
	Strike Tree Potential(26 Priority, 4.6/m)	High Fall-In Risk	Moderate Fall-In Risk	No Fall-In Risk	Moderate Fall-In Risk
Secondary Filter	Ingress / Egress	Non-satisfactory	Satisfactory	Satisfactory	Satisfactory
	PSPS Mitigation (18 costs * 1 event)	18 (0%)	18 (0%)	18 (0%)	18 (0%)
	Execution Timeline (2021, 2022, 2022+)		2021	2022+	2022+
	Other (Operational Considerations, etc.)		Recommended		

Supporting Detail for Recommended Alternative: EDRS L&M (1011-04103)

Public Safety Specialist: Sheets, Tehama Co., Platina E to Hwy 50 Tehama mile mark 3.42. Mainly grass/low wood/land dense brush with intermixed patches of conifers/Grey Pines. Fuel loading of brush can be very dense on all northern aspects and drainage and within the drainage. Some portions of Cottonwood Creek. Difficult fire terrain.

Platina pop-100 -40 mile W/O Reding Road Buff. Platina Rd

Water Tree Potential: Moderate. Expect to mitigate tree strikes around on 3 spans with tree removal.

Agree Considerations: Platina Rd, Hwy 50 main routes for trees and response. Satisfactory mitigation with overhead hardening and tree removal.

PSPS Mitigation Item:

Execution Timeline/and/Cultural/Constructability: Frog and Fish Issues: Buffer Zone for work, Monitoring BLM Land, Minor Caltrans. 7-8 WA field work. Gas Tx line easement along much of route requires hand of 30' NG

Overhead route impacts visibility. Relocation of overhead assets requires entering Caltrans ROW with significant increase in circuit line/feet (425% minimum).

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

Key Decision – Approval of workplan change request

Approval Status Pending

Decision Detail

Approval of recommended installation (Overhead Hardening) for Wildwood 11011454 (PM) [REDACTED]

Additional details available: [EDRS Link \(2021-04538\)](#)

Concerns and Mitigations

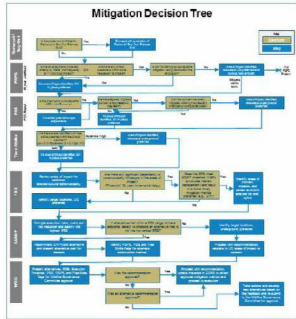
Approvals

[REDACTED]	

Action Items and Validations

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION



	Key Questions	Outcome
PSPS	Is this an area that is impacted directly by PSPG (+8 Frequency or +1,200 Cust Impact)?	Y N 2 events 309 custs
	Are there any critical customers within zone necessary to protect?	Y N
PPS	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y N High Tree Strike Risk
	Is the area being considered for HFRA Add/Remove?	Y N
Tree Strike	Ingress/Egress concerns identified by PGG professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y N
	Moderate (8-14) or High (15+) strike tree potential areas in the segment.	Y N High
FSD	Are there any significant dependency or constructability limitations in the areas of impact? (Threshold: 2+ year incremental delay)	Y N
	Does the CPZ meet ECOP threshold (+25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y N
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y N Hybrid Preferred

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION

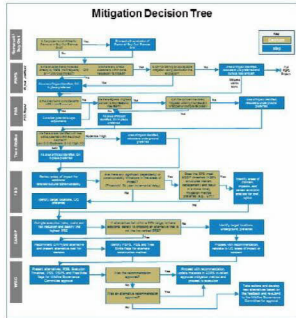
Inform: ECOP Top 20% – Middletown 1101 - LR 548 - H12 Ph2 - PM

	Middletown 1101 (9.46 miles)	No System Hardening	OH-Hybrid-UG Preferred	Hybrid-UG-Hybrid Alt 1	UG-OH-OH Alt 2
Project Scope Risk Reduced After Mitigation		16.40	14.32	13.44	12.90
Project Scope Residual Risk Value		9.46 Existing OH	2.08	2.96	3.90
Overall Miles Removed		-	8.40	8.62	2.79
OH System Hardening Cost	risk-mile	-	1.68	1.68	1.68
UG System Hardening Cost	risk-mile	-			
Line Removal Cost	risk-mile	-			
Total Capital Cost (AAEC Class 5)					
Average O&M Cost (per year)					
NPV @ 8.5% discount rate					
\$ NPV per unit of risk (RSE)					
Primary Filter					
PSS Preference (Ingress/Egress/Fire history)			Satisfactory	Non-satisfactory	Non-satisfactory
Strike Tree Potential		High Fall-In Risk	Low Fall-In Risk	High Fall-In Risk	High Fall-In Risk
Ingress / Egress		Non-satisfactory	Satisfactory	Non-satisfactory	Non-satisfactory
Secondary Filter					
PSS Mitigation (309 cuts * 2 events)		618 (0%)	618 (0%)	618 (0%)	618 (0%)
Execution timeline (2021, 2022, 2022+)			2022	2022	2022
Other (Operational Considerations, etc.)			Recommended		Accessibility Issues

Supporting Detail for Recommended Alternative (ERS Link [Link](#))

- Risk Safety Benefits:** The "cut" option for this project does not require any removal of overhead lines or removal of overhead lines to be removed. The "cut" option for this project does not require any removal of overhead lines or removal of overhead lines to be removed. The "cut" option for this project does not require any removal of overhead lines or removal of overhead lines to be removed.
- Strike Tree Potential:** High (5%) tree strike potential exists in the project area. The project area is located in a high-risk area. The project area is located in a high-risk area. The project area is located in a high-risk area.
- Execution Timeline (and/or) Other Considerations:** Work required during the dry season (May 15 - Oct 15) and/or during the winter season.

Confidential



	Key Questions	Outcome
PSPS	Is this an area that is impacted directly by PSPS (-8 Frequency, or >1,200 Cust Impact)?	Y N 18 events
	Are there any critical customers within zone necessary to protect?	Y N N/A
FSS	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y N N/A
	Is the area being considered for HFRA Add/Remove?	Y N HFRA removal approved, project would not be required
Tree Strike	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intransient, wrapped or composite poles.	Y N N/A
	Moderate (6-14) or high (11+) strike free potential areas in the segment.	Y N Based on Alternative plans
FSD	Are there any significant dependency or constructability limitations in the areas of impact? (Threshold: 2+ year incremental delay)	Y N N/A
	Does the CPZ meet ECOP threshold (>25% structures, warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y N N/A
EASDP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y N Underground Preferred

CONFIDENTIAL CONFIDENTIAL CONFIDENTIAL

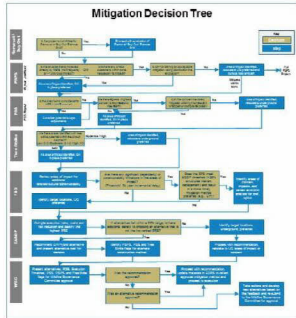
Inform: PSPS - Brunswick 1110 - LR 94768 - PM [REDACTED] - Morgan Ranch

	Brunswick 1110 (0.34 miles)	No System Hardening	Overhead Hardening	Under-Grounding	Hybrid
Project Scope Risk Reduced After Mitigation			0.02	0.04	0.03
Project Scope Residual Risk Value		0.036	0.04	0.00	0.01
Overall Miles Installed		0.34 Existing OH	0.34	0.06	0.38
Overall Miles Removed		-	-	-	0.17
OH System Hardening Cost	risk-mile	-	-	-	-
UG System Hardening Cost	risk-mile	-	-	-	-
Line Removal Cost	risk-mile	-	-	-	-
Total Capital Cost (AAEC Class 5)					
Average O&M Cost (per year)					
NPV @ 6.5% discount rate					
Primary Filter	\$ NPV per unit of rise (RSE)		Satisfactory	Satisfactory	Satisfactory
	PSS Preference (Ingress/egress/fire history)		Satisfactory	Satisfactory	Satisfactory
Secondary Filter	Strike Tree Potential	High Fall-in Risk	High Fall-in Risk	No Fall-in Risk	Moderate Fall-in Risk
	Ingress / Egress	Satisfactory	Satisfactory	Preferred	Satisfactory
	PSPS Mitigation (178 cuts * 18 events)	2024 (0%)	2024 (0%)	2024 (0%)	2024 (0%)
	Execution timeline (2021, 2022, 2022+)		2021	2022	2022+
	Other (Operational Considerations, etc.)			Recommended	

Supporting Detail for Recommended Alternative (EDRS Routing: 2021-2022):

- Public Safety Specialist: Fuel type broken up between grass and residential landscaping. Population density is considered moderate to heavy. There is no fire history around this project area. Preference for action to be taken based on increased risk of ignition on tagged equipment.
- Strike Tree Potential: 80 total strike tree potential in the CPZ.
- Ingress Considerations: Main routes of travel for ingress and egress would be Sierra College Drive. Ingress and egress into and out of the area by way of Sierra College Drive or Ridge Road would not be an issue.
- PSPS Mitigation: If HRA removal is approved would eliminate PSPS shutdowns.
- Execution Timeline (Land/line/Cultural/Contractability): UG hardening could be accomplished by 12/31/2021. Spotted owl near project area.
- Note: 0.34 miles of project represents the project miles for the alternative (OH & UG) across in Tier-2 area. Mileage for OH scope is only 0.021 mi for preferred scope in Tier 1 area.

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION



	Key Questions	Outcome
	Is this an area that is impacted directly by PSPG (-8 Frequency or >1,200 Cust Impact)?	Y N 15 events 15 cust impact
PSPS	Are there any critical customers within zone necessary to protect?	Y N
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y N N/A
	Is the area being considered for HFRA Add/Remove?	Y N
PSS	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y N
Tree Strike	Moderate (8-14) or High (15+) strike tree potential areas in the segment.	Y N Moderate (8-14)
	Are there any significant dependency or constructability limitations in the areas of impact? (Threshold: 2+ year incremental delay)	Y N
FSD	Does the CPZ meet ECOP threshold (<25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y N
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y N
		Remote Grid Preferred

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION

Inform: REMG – Placerville 2106 - LR 1104 - PM

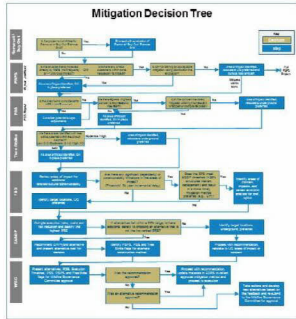
Placerville 2106 (0.70 miles)		No System Hardening	Overhead Hardening	Under-Grounding	Remote Grid
Project Scope Risk Reduced After Mitigation		0	0.02	0.03	0.03
Project Scope Residual Risk Value		0.03	0.01	0.00	0.00
Overall Miles Installed		0.70 Existing OH	-	-	-
Overall Miles Removed		-	0.7	0.7	0.70
CH System Hardening Cost		-	-	-	-
UG System Hardening Cost		-	-	-	-
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 rise (RSE)		Non-satisfactory	Satisfactory	Satisfactory
Filter	P&S Preference (Ingress/egress/fire history)		Non-satisfactory	Satisfactory	Satisfactory
Secondary Filter	Strike Tree Potential	Moderate (6-14)	Moderate Fall-in Risk	No Fall-in Risk	Low Fall-in Risk
Filter	Ingress / Egress	Non-satisfactory	Non-satisfactory	Satisfactory	Satisfactory
	P&S Mitigation (1 cuts * 15 events)	68 (9%)	68 (9%)	84 (50%)	17 (25%)
	Execution timeline (2021, 2022, 2022+)		2021	2022+	2022
	Other (Operational Considerations, etc.)				

Supporting Detail for Recommended Alternative (EDRS Link 2020-21336):

- Public safety specialist: The fuel types for this project area were not noted on the previously held field scoping meeting. Population density for this project area is all considered low. Numerous fires within vicinans.
- Strike Tree Potential: Moderate (6-14) tree strike potential in this segment suggests UG or Remote Grid hardening is required.
- Ingress/Egress Considerations: No major egress concern.
- P&S Mitigation: Remote and would allow P&S mitigation.
- Execution Timeline (Landfile/Cultural/Constructability): No known construction or EIS constraints.

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

Inform: PSPS - Mountain Quarries 2101 - TS 6953 - PM



	Key Questions	Outcome
PSPS	Is this an area that is impacted directly by PSPS (>6 Frequency or >1,200 Cust Impact)?	Y N
	Are there any critical customers within zone necessary to protect?	Y N
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y N N/A
PPS	Is the area being considered for HFRA Add/Remove?	Y N
	Ingress/Egress concerns identified by PPS professionals cannot be mitigated by utilizing imunescent wrapped or composite poles.	Y N Ingress/Egress route limited
Tree Strike	Moderate (8-14) or High (15+) strike tree potential areas in the segment.	Y N Moderate tree strike potential
	Are there any significant dependency or constructability limitations in the areas of impact? (Threshold: 2+ year incremental delay)	Y N
FSD	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y N
	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y N Hybrid accounts for Egress/Ingress and Tree Risk
EASOP		Hybrid Preferred

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION

Inform: PSPS - Mountain Quarries 2101 - TS 6953 - PM

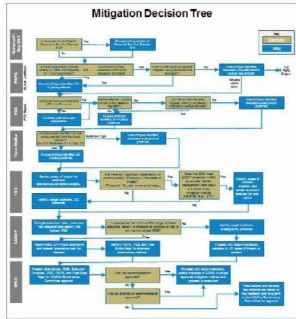
Mountain Quarries 2101 (3.72 miles)	No System Hardening	Overhead Hardening	Under-Grounding	Hybrid
Project Scope Risk Reduced After Mitigation		15.65	24.99	22.27
Project Scope Residual Risk Value	25.247	9.99	0.25	2.98
Overall Miles Installed		5.72 Existing OHI	6.36	5.96
Overall Miles Removed	-	-	-	-
OHI System Hardening Cost	risk-mile	-	-	-
UG System Hardening Cost	risk-mile	-	-	-
Line Removal Cost	risk-mile	-	-	-
Total Capital Cost (AACE Class 5)				
Average O&M Cost (per year)				
NPV @ 6.5% discount rate				
Primary Filter				
\$ NPV per unit of risk (RSE)				
PSS Preference (Ingress/egress/fire history)		Non-satisfactory	Satisfactory	Satisfactory
Secondary Filter				
Strikes Tree Potential	High Fall-in Risk	Moderate Fall-in Risk	No Fall-in Risk	Low Fall-in Risk
Ingress / Egress	Non-satisfactory	Non-satisfactory	Satisfactory	Satisfactory
PSPS Mitigation (69 cuts * 7 event)	455 (9%)	455 (9%)	455 (9%)	455 (9%)
Execution timeline (2021, 2022, 2022+)		2021	2022+	2022
Other (Operational Considerations, etc.)				

Recommended

- Supporting Detail for Recommended Alternative (EPRS Routing [2021-0801](#)):
- Public Safety Specialist: Fuels in the project area are grass, oak woodland and grey pines with patches of brush and scrub oak. Fuel loading is low in the project area, but transition to heavy in some of the brush fields located in the adjacent canyon to the south. The topography is rolling foothills and ridge top at approximately 1000 ft elevation. There have been no recent fires, however, project area is surrounded by major fires from the Trailhead Fire (2016), the Mammoth Fire (2009) Cool Fire (2008) and the Cutter Fire (2003).
 - Strikes Tree Potential: 284 total strikes tree potentials in the CPZ.
 - Ingress Considerations: Main roads are Hwy 286 and Hwy 49. Both roads are two lanes paved with no shoulder that would be quickly become inundated in the event of a mass evacuation or rapidly expanding wildfire incident.
 - PSPS Mitigation: 7 operations for PSPS in last 10 years. Approximately 4 miles to get to power source to accommodate PSPS resiliency.
 - Execution Timeline (Land/Cultural/Community): California red-legged frog; targeted pre-activity survey may be required for overland and UG section of the project.

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

Inform: PSPS – PM# [REDACTED] – Bangor 1101 CB - Microgrid



	Key Questions	Outcome
PSPS	Is this an area that is impacted directly by PSPS (≥4 Frequency or >1200 Cust Impact)?	Y N Over 1200 cust.
	Are there any critical customers within zone necessary to protect?	Y N Fire Department, Telecom's Community Center
	Is OHI hardening an acceptable mitigation using distribution line exclusion?	Y N N/A
PIS	Is the area being considered for IFRA Add/Remove?	Y N
	Ingress/Egress concerns identified by PIS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y N
TWA	Moderate (6-14) or high (15+) strike free potential areas in the segment.	Y N
FSD	Are there any significant dependency or constructability limitations in the areas of impact? (Threshold: 2+ year noncritical delay)	Y N
	Does the CP2 meet ECOP threshold (>95% structures warrant replacement) and result in a more timely mitigation method preferred (e.g. OHI)?	Y N
EACOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y N ALL UG Preferred

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION

Inform: PSPS – PM# [REDACTED] – Bangor 1101 CB - Microgrid

	Bangor 1101 (0.57 mile)	No System Hardening	Overhead Hardening	Under-grounding
Project Scope Risk Reduced After Mitigation		0.62	0.12	1.00
Project Scope Residual Risk Value		1.01	0.38	0.01
Overall Miles Installed		0.57 Existing OH	0.57	0.00
OH System Hardening Cost	Risk/mile	-	-	-
UG System Hardening Cost	Risk/mile	-	-	-
Line Removal Cost	Risk/mile	-	-	-
Total Capital Cost				
Average O&M Cost (per year)				
NPV @ 6.0% discount rate				
\$ NPV per unit of risk (RSE)				
Primary Filter				
PSS Preference (Ingress/egress/fire history)		Satisfactory	Satisfactory	Preferred
Strike Tree Potential		Low Fall-In Risk	Low Fall-In Risk	N/A
Ingress/Egress – Preferred option		Satisfactory	Satisfactory	Preferred
Secondary Filter				
PSPS Mitigation (2621 Customers * 1 event)		2621 (0%)	2621 (0%)	2572 (1.9%)
Execution timeline (2021, 2022, 2022+)		-	2022	2022
Other (Operational Considerations, etc.)		Fire department, telecom, & community center	Fire department, telecom, & community center	Fire department, telecom, & community center
				Recommended
Supporting Detail for Recommended Alternative (EDRS Routing 2021-2022): <ul style="list-style-type: none"> Public Safety Specialist: Fuel types in the Bangor area consistent with grass, oak woodland, mixed brush and scattered conifers, primarily Gray Pines. The large fires in the Bangor have been driven under two primary factors, mid-summer fuel/topography driven fires such as the Swedes and Walls, and, wind driven, fall period fires such as the October Wind Complex fires of 2017. Strike Tree Potential: 15 total strike potential trees in the CP2, LDW (B-5) tree strike potential. Ingress Considerations: Ingress and egress for first responders and residents, depending upon fire location and spread would be by one or more roadways. PSPS Mitigation: Project is driven by keeping critical customers such as the fire department, telecom building, and community center energized during a PSPS event. Execution Timeline (Land/Bio/Cultural/Constructability): OH Hardening will require coordination with transmission line. Monitoring may be required for UG trenching. Field work is anticipated to take less than 1 week. Water: Battery microgrid will be installed in the substation to keep critical customers energized. 				

Workplan change request details - 11 projects added (13.5 mi) and 2 projects removed (3.3 mi)

Order	Project	Rationale/details
	CWSP - PINE GROVE 1102 - LR1222 - PH 2.6	<ul style="list-style-type: none"> 13 poles installed Recommended that this project be moved to "keep" status
	CWSP - STANISLAUS 1702- LR1888- PH 1.2	<ul style="list-style-type: none"> 15 poles installed SPF issues are keeping this project in UNDEC status Request to move to "keep" status
	RECON 2300 FT - NUNS CANYON - DUNBAR 1101	<ul style="list-style-type: none"> Obtaining this permit required several years of discussion with the CDFW and messaging that the work is critical to the wildlife plan. PCSE also developed a mitigation plan and will be on the hook for implementing and paying for it regardless of whether or not this project moves forward. Request to move to "Keep" status
	CWSP BRUNSWICK 1103- LR5070- PH 2.3	<ul style="list-style-type: none"> PH Reamant told to keep 2.1, 2.2, 2.4, and 2.5 2.1 & 2.2 are "Other" complete All of these projects are in CIGMS Requesting that this project (Phase 2.3) be moved to "Keep" status with the other phases.
	RECON-6 SPANS CAMP ONE TEN MILE FT BRAGG	<ul style="list-style-type: none"> This is a project for which we have applied for a Coastal Development Permit with the Agency and have been open public hearing on the project already. It is anticipated that the permit will be issued in early 2021. This permit took 2 years to obtain, and many messages to the agency that it be prioritized due to the critical nature of the work. The agency has recently agreed to use an emergency statutory exemption under CEQA to approve the project with the understanding that longer CEQA process would prevent our ability to perform critical wildfire work. Request to move to "Keep" status
	SH RECONDUCTOR ROB ROY 2105 - 5026CC117	<ul style="list-style-type: none"> This is a project for which we have applied for a Coastal Development Permit with the Santa Cruz County and have been signing with them for a the last year. In progress with Santa Cruz since Feb 2019. CDFW permit on delay since Aug 2020. Permits expected by 11/21/21. Would be a detriment to our relationship with CDFW and Santa Cruz to cancel this project. Request that this project be moved to "Keep" status to preserve relationship with CDFW and Santa Cruz county.
	SH RECONDUCTOR - ROB ROY 2205 - 5027CC118	<ul style="list-style-type: none"> This is a project for which we have applied for a Coastal Development Permit with the Santa Cruz County and have also been working with CDFW on work within critical habitat on their property. Both agencies have been engaged on the project for the last year. In progress with Santa Cruz since mid 2019. CDFW permit on delay since Aug 2020. Permits expected by 11/21/21. Would be a detriment to our relationship with CDFW and Santa Cruz to cancel this project. Request that this project be moved to "Keep" status to preserve relationship with CDFW and Santa Cruz county.

Confidential CONFIDENTIAL - FOR INTERNAL DISCUSSION

Workplan change request details - 11 projects added (13.5 mi) and 2 projects removed (3.3 mi)

Order	Project	Rationale/details
Request to Reject	CWSP-STANISLAUS 1702-UR1888-PH 2.8	<ul style="list-style-type: none"> 3 assessments have been acquired for this project All assessments reviewed with an accepted cost No other critical reasons to consider keeping this project Want to confirm the "Remove" status in light of assessment status
	PSPS - Clayton 2235 - CB	<ul style="list-style-type: none"> 3 assessments - 1 with city of Walnut Creek all terms accepted - 1 with Dave Mt. Dislike some language clarifications still underway - 3 amount accepted - 1 with a development company's amount accepted just need some finalized No other critical reasons to consider keeping this project Want to confirm the "Remove" status in light of assessment status
	HALF MOON BAY 1102 - FUCO 12457 REPL OH	<ul style="list-style-type: none"> COGRS permit received and iron has been Want to confirm "Remove" status due the noise of the land use permit
	CWSP-MINWUK 1762-UR0018-PH 1.1	<ul style="list-style-type: none"> This Phase 1.1 is in between Phase 1.2 and 1.3 both of which are inactive and have been abandoned Want to confirm the "Remove" status in light of the hardening work performed on the phases on each end of this portion of railline
Remove	CWSP-MINWUK 1761-OCR-PH 1.5	<ul style="list-style-type: none"> in COMB and only 5 poles installed 1 location missed during field review that will require redesign of the project or Investment domain. Have been pursuing land rights since summer of 2020 Suggest that this project be moved to remove (all anchors have OC either frame the 5 poles around the existing line if practical or remove the poles and close out the project.
	CWSP-BRUNSWICK 1103-UR2206-PH2	<ul style="list-style-type: none"> PM team was told to keep this phase but told to remove Phase 1, Phase 3, & Phase 4 No work has started on phase 2 Suggest that either all phases are moved to "Keep" status or more phase 2 to "Remove" status.

Confidential

CONFIDENTIAL - FOR INTERNAL DISCUSSION