

Risk Assessment and Mitigation Phase

(Chapter SCG-Risk-4-WP)

Incident Related to the Storage System (Excluding Dig-in)

Workpapers

May 17, 2021

2021 RAMP SCG-Risk-4-WP Risks Recorded and Forecast Units Workpaper Tab: Incurred\$

				RECORDED DOLLARS								FORECAST DOLLARS														
						0&M					Capital					08	M				A .					
		Control /		2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	202	2022		2023		2024		2022		2023		024	Shared Allocations
RAMP Chapter ID	RAMP Chapter Name	Mitigation ID	Control / Mitigation Name	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	\$ Low	\$ High	\$ Low	\$ High	(Yes/No)								
	Incident Related to the Storage System		,																						1	
SCG-Risk-4	(Excluding Dig-In)	C1	Integrity Demonstration, Verification, and Monitoring Practices	\$ 9.081	\$ 10.872	\$ 7,585	\$ 6.903	\$ 13,413	\$ 47.955	\$ 61,253	\$ 57.852	\$ 40.818	\$ 66.676	\$ 14.834	\$ 17.957	\$ 14.834	\$ 17.957	\$ 14.834	\$ 17.957	\$ 87.907	*******	\$ 87.907	\$ 106,413	\$ 87.907	\$ 106.413	No
	Incident Related to the Storage System			1	1				1 / / / /		,	,										1				
SCG-Risk-4	(Excluding Dig-In)	C2	Well Abandonment and Replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,682	\$ 9,455	\$ 36,394	\$ 23,981	\$ 14,926	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 42,742	\$ 51,740	\$ 48,442	\$ 58,640	\$ 29,442	\$ 35,640	No
	Incident Related to the Storage System																								1	
SCG-Risk-4	(Excluding Dig-In)	C3	Pressure Monitoring and Alarming	\$ 668	\$ 489	\$ 1,077	\$ 574	\$ 284	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 387	\$ 468	\$ 387	\$ 468	\$ 387	\$ 468	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No
	Incident Related to the Storage System																								1	
SCG-Risk-4	(Excluding Dig-In)	C4	Wellhead Leak Detection and Repair	\$ 2,741	\$ 5,670	\$ 6,489	\$ 8,699	\$ 7,913	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,490	\$ 9,066	\$ 7,490	\$ 9,066	\$ 7,490	\$ 9,066	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No
	Incident Related to the Storage System																									
SCG-Risk-4	(Excluding Dig-In)	C5	Storage Field Maintenance	\$ 32,557	\$ 31,071	\$ 29,911	\$ 30,892	\$ 36,295	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 31,670	\$ 38,337	\$ 32,620	\$ 39,487	\$ 33,599	\$ 40,672	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No
	Incident Related to the Storage System																									1
SCG-Risk-4	(Excluding Dig-In)	C6	Compressor Overhauls	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,299	\$ 3,778	\$ 5,166	\$ 4,140	\$ 1,959	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,377	\$ 5,922	\$ 4,478	\$ 6,058	\$ 4,377	\$ 5,922	No
	Incident Related to the Storage System																									1
SCG-Risk-4	(Excluding Dig-In)		Upgrade to Purification Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,081	\$ 3,140	\$ 3,801	\$ 3,042	\$ 1,136	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,440	\$ 6,007	\$ 6,794	\$ 9,192	\$ 5,836	\$ 7,896	No
	Incident Related to the Storage System																									
SCG-Risk-4	(Excluding Dig-In)	M1	Facilities Integrity Management Program (FIMP)	\$ -	\$ 118	\$ 9	\$ 32	\$ 1,801	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,960	\$ 3,640	\$ 1,890	\$ 3,510	\$ 1,330	\$ 2,470	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	No
	Incident Related to the Storage System																									
SCG-Risk-4	(Excluding Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,233	\$ 4,933	\$ 987	\$ 4,933	\$ 987	\$ 4,933	\$ 7,076	\$ 28,305	\$ 5,661	\$ 28,305	\$ 5,661	\$ 28,305	No
	Incident Related to the Storage System																									
SCG-Risk-4	(Excluding Dig-In)	A2	Alternate Technology for Methane Monitoring	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,420	\$ 4,370	\$ -	\$ -	\$ -	\$ -	No
NOTES:						1	1	1								1	1		1			1			1	
																										1
[1] The figures pro-	vided are direct charges and do not inclu	de company loa	aders, with the exception of vacation and sick. The costs are also	in 2020 dol	lars and hav	e not been	escalated to	2021 amou	unts.							1	1		1			1			4	
Iran						1	1	1								1	1		1			1			1	
Z LUSIS are provid	ded, where available, for all activities rega	iruiess of Wheti	ner a roc analysis was performed.	1	1	1	1	1	1	1		1	1	l .	1	1	1	1	1	1	1	1	1	l .	1	1

2021 RAMP SCG-Risk-4-WP Risks Shared Allocations Workpaper Tab: Shared Allocations

(2020 Direct \$000)

				Shared Allocations								
RAMP Chapter ID	RAMP Chapter Name	Control / Mitigation ID	Control / Mitigation Name	Retained	SDG&E	Sempra Energy	Other					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	C1	Integrity Demonstration, Verification, and Monitoring Practices	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	C2	Well Abandonment and Replacement	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	C3	Pressure Monitoring and Alarming	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	C4	Wellhead Leak Detection and Repair	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	C5	Storage Field Maintenance	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	C6	Compressor Overhauls	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	C7	Upgrade to Purification Equipment	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	M1	Facilities Integrity Management Program (FIMP)	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	100%	0%	0%	0%					
	Incident Related to the Storage System (Excluding											
SCG-Risk-4	Dig-In)	A2	Alternate Technology for Methane Monitoring	100%	0%	0%	0%					

2021 RAMP SCG-Risk-4-WP Risks Recorded and Forecast Units Workpaper Tab: After Allocations\$

				RECORDED DOLLARS										FORECAST DOLLARS													
						0&M					Capital				O&M							Capital					
		Control /		2016	2017	2018	2019	2020	2016	2017	2018	2019	2020		2022		2023		2024		2022		2023		2024		
RAMP Chapter ID	RAMP Chapter Name	Mitigation ID	Control / Mitigation Name	2010	2017	2010	2019	2020	2016	2017	2010	2013	2020	\$ Lo	w \$Hi	gh \$Low	\$ High	\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High	\$ Low	\$ High		
	Incident Related to the Storage System																							1			
SCG-Risk-4	(Excluding Dig-In)	C1	Integrity Demonstration, Verification, and Monitoring Practices	\$ 9,081	\$ 10,872	\$ 7,585	\$ 6,903	\$ 13,413	\$ 47,955	\$ 61,253	\$ 57,852	\$ 40,818	\$ 66,67	6 \$ 14	834 \$ 17,	57 \$ 14,8	4 \$ 17,957	\$ 14,83	\$ 17,95	5 87,907	*********	\$ 87,907	\$ 106,413	\$ 87,9	07 \$ 106,4		
	Incident Related to the Storage System																										
SCG-Risk-4	(Excluding Dig-In)	C2	Well Abandonment and Replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,682	\$ 9,455	\$ 36,394	\$ 23,981	\$ 14,92	6 \$	- \$. \$ -	\$ -	\$ -	\$ -	\$ 42,742	\$ 51,740	\$ 48,442	\$ 58,640	\$ 29,4	42 \$ 35,6		
i .	Incident Related to the Storage System																										
SCG-Risk-4	(Excluding Dig-In)	C3	Pressure Monitoring and Alarming	\$ 668	\$ 489	\$ 1,077	\$ 574	\$ 284	\$ -	\$ -	\$ -	\$ -	\$ -	\$	387 \$	168 \$ 31	7 \$ 468	\$ 38	7 \$ 46	3 \$ -	\$ -	\$ -	\$ -	s -	\$ -		
	Incident Related to the Storage System																							1			
SCG-Risk-4	(Excluding Dig-In)	C4	Wellhead Leak Detection and Repair	\$ 2,741	\$ 5,670	\$ 6,489	\$ 8,699	\$ 7,913	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7	490 \$ 9,	066 \$ 7,45	0 \$ 9,066	\$ 7,49	\$ 9,06	5 \$ -	\$ -	\$ -	\$ -	s -	\$ -		
	Incident Related to the Storage System		·																					1			
SCG-Risk-4	(Excluding Dig-In)	C5	Storage Field Maintenance	\$ 32,557	\$ 31,071	\$ 29,911	\$ 30,892	\$ 36,295	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 31	670 \$ 38,	37 \$ 32,6	0 \$ 39,487	\$ 33,59	\$ 40,67	2 \$ -	\$ -	\$ -	\$ -	s -	\$ -		
	Incident Related to the Storage System																							1			
SCG-Risk-4	(Excluding Dig-In)	C6	Compressor Overhauls	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,299	\$ 3,778	\$ 5,166	\$ 4,140	\$ 1,95	9 \$	- \$	- \$ -	\$ -	\$ -	\$ -	\$ 4,377	\$ 5,922	\$ 4,478	\$ 6,058	\$ 4,3	77 \$ 5,9		
	Incident Related to the Storage System																										
SCG-Risk-4	(Excluding Dig-In)	C7	Upgrade to Purification Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,081	\$ 3,140	\$ 3,801	\$ 3,042	\$ 1,13	6 \$	- \$	- \$ -	\$ -	\$ -	\$ -	\$ 4,440	\$ 6,007	\$ 6,794	\$ 9,192	\$ 5,8	36 \$ 7,8		
	Incident Related to the Storage System																										
SCG-Risk-4	(Excluding Dig-In)	M1	Facilities Integrity Management Program (FIMP)	\$ -	\$ 118	\$ 9	\$ 32	\$ 1,801	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1	960 \$ 3,	40 \$ 1,89	0 \$ 3,510	\$ 1,33	\$ 2,470) \$ -	\$ -	\$ -	\$ -	s -	\$ -		
	Incident Related to the Storage System																							1			
SCG-Risk-4	(Excluding Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1	233 \$ 4,	33 \$ 9	7 \$ 4,933	\$ 98	7 \$ 4,93	\$ 7,076	\$ 28,305	\$ 5,661	\$ 28,305	\$ 5,6	61 \$ 28,3		
	Incident Related to the Storage System																							1			
SCG-Risk-4	(Excluding Dig-In)	A2	Alternate Technology for Methane Monitoring	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$	- \$	- \$ -	\$ -	\$ -	\$ -	\$ 3,420	\$ 4,370	\$ -	\$ -	\$ -	\$ -		
NOTES:		•																									
[1] The figures pro	vided are direct charges and do not include		ers, with the exception of vacation and sick. The costs are also in 20	20 dollars a	and have no	been escala	ated to 202:	L amounts.																			

2021 RAMP SCG-Risk-4-WP Risks Recorded and Forecast Units Workpaper Tab: Units

						RECORDED UNITS											FORECAST UNITS											
							0&M					Capital					0&	м			Capital							
		Control /		Units Description		2016	5 2017	2018	2019	2020	2016	2017	2018	2019	2020	20	2022		2023		124	2022		2023		2	024	
RAMP Chapter II	RAMP Chapter Name	Mitigation I	Control / Mitigation Name	Capital	0&M	2010	2017	2010	2023	2020	2010	2017	2010	2013	2020	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	
SCG-Risk-4	Incident Related to the Storage System	C1	Integrity Demonstration, Verification, and Monitoring Practices	# of wells having	# of wells having																							
	(Excluding Dig-In)			undergone	undergone																							
i				integrity	integrity																							
				assessment	assessment	41	44	40	17	52	41	44	40	17	52	58	70	58	70	58	70	58	70	58	70	58	70	
	Incident Related to the Storage System																										1	
SCG-Risk-4	(Excluding Dig-In)	C2	Well Abandonment and Replacement	# wells abandoned	N/A	-	-	-	-		3	3	20	38	9	-	-	-	-	-		8	9	8	9	8	9	
SCG-Risk-4	Incident Related to the Storage System	C3	Pressure Monitoring and Alarming		# storage wells																							
	(Excluding Dig-In)				with annulus																							
				N/A	monitoring	4	4	118	118	118		-		-	-	112	112	110	112	108	112	-	-		-	-		
SCG-Risk-4	Incident Related to the Storage System	C4	Wellhead Leak Detection and Repair		# storage wells																							
	(Excluding Dig-In)				subject to																							
					wellhead leak																							
					detection and																							
				N/A	repair activities	4	4	118	118	118		-		-	-	106	112	110	112	108	112	-	-		-			
	Incident Related to the Storage System																											
SCG-Risk-4	(Excluding Dig-In)	C5	Storage Field Maintenance	N/A	No Feasible Units	-		-				-		-		-	-	-		-		-	-		-	-		
	Incident Related to the Storage System																											
SCG-Risk-4	(Excluding Dig-In)	C6	Compressor Overhauls	# of Storage Fields	N/A	-	-	-	-		5	5	5	5	5	-		-	-			4	6	4	6	4	6	
	Incident Related to the Storage System																											
SCG-Risk-4	(Excluding Dig-In)	C7	Upgrade to Purification Equipment	# of Storage Fields	N/A	-	-	-	-		4	4	4	4	4	-	-	-		-		4	4	4	4	4	4	
	Incident Related to the Storage System																											
SCG-Risk-4	(Excluding Dig-In)	M1	Facilities Integrity Management Program (FIMP)	N/A	# of Storage Fields	-	4	4	4	4				-	-	1	4	1	4	1	4	-	-		-			
	Incident Related to the Storage System				1																							
SCG-Risk-4	(Excluding Dig-In)	A1	Risk-Based Well Casing Inspection Frequency	Wells	N/A	-	-	-	-		-	-		-	-	5	20	4	20	4	20	5	20	4	20	4	20	
	Incident Related to the Storage System							1																	1	1	1	
SCG-Risk-4	(Excluding Dig-In)	A2	Alternate Technology for Methane Monitoring	Monitors	N/A	I	1			l	l	I	l	I	I					1		248	317		1 -	1	.1	