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APPENDIX E: 2024 Local Capacity Technical Analysis

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2024 LOCAL CAPACITY TECHNICAL ANALYSIS

FINAL REPORT AND STUDY RESULTS

February 2, 2015

Local Capacity Technical Analysis Overview and Study Results

I. Executive Summary

This Report documents the results and recommendations of the 2024 Long-Term Local Capacity Technical (LCT) Study. The LCT Study objectives, inputs, methodologies and assumptions are the same as those discussed in the 2015 LCT Study to be adopted by the CAISO and CPUC in their 2015 Local Resource Adequacy needs.

Overall, the LCR trend compared with 2019 is upward by about 1,100 MW mainly due to combination of higher load forecast and new transmission projects. It is worth mentioning the following areas: (1) Humboldt, North Coast/North Bay, Stockton, and Bay Area, LCR is steady due to a combination of load forecast and new transmission projects; (2) Sierra, Fresno and Big Creek/Ventura, where the LCR has increased mostly due to load forecast; (3) Kern and LA Basin, where the LCR has significantly decreased mostly due to new transmission projects; (4) San Diego-Imperial Valley where LCR has increased due to OTC retirement in the LA Basin and San Diego.

This Valley Electric Association (VEA) area is eliminated due to new transmission projects, the incorporation of the VEA UVLS model into the contingency analysis as well as the availability of ISO operating procedure 7910 that addresses some category C issues.

The load forecast used in this study is based on the final adopted California Energy Demand 2014 - 2024 Final Forecast developed by the CEC; namely the mid-demand baseline with low-mid additional achievable energy efficiency (AAEE), posted at: http://www.energy.ca.gov/2013_energypolicy/documents/.

For comparison below you will find the 2019 and 2024 total LCR needs.

2019 Local Capacity Needs

Local Area Name	Qualifying Capacity			2019 LCR Need Based on Category B			2019 LCR Need Based on Category C with operating procedure		
	QF/ Muni (MW)	Market (MW)	Total (MW)	Existing Capacity Needed	Deficiency	Total (MW)	Existing Capacity Needed**	Deficiency	Total (MW)
Humboldt	36	171	207	123	0	123	173	0	173
North Coast/ North Bay	130	771	901	310	0	310	516	0	516
Sierra	1299	771	2070	525	0	525	1102	0	1102
Stockton	295	392	687	163	0	163	308	43*	351
Greater Bay	1262	5589	6851	3198	0	3198	4224	0	4224
Greater Fresno	316	2532	2848	1463	0	1463	1545	44*	1589
Kern	225	87	312	156	32*	188	161	32*	193
LA Basin	2207	8985	11192	9059	0	9059	9119	0	9119
Big Creek/Ventura	1160	4203	5363	2499	0	2499	2619	0	2619
San Diego/ Imperial Valley	219	4004	4223	3160	3*	3163	3160	130*	3290
Total	7149	27505	34654	20656	35	20691	22927	249	23176

2024 Local Capacity Needs

Local Area Name	Qualifying Capacity			2024 LCR Need Based on Category B			2024 LCR Need Based on Category C with operating procedure		
	QF/ Muni (MW)	Market (MW)	Total (MW)	Existing Capacity Needed	Deficiency	Total (MW)	Existing Capacity Needed**	Deficiency	Total (MW)
Humboldt	36	171	207	127	0	127	178	0	178
North Coast/ North Bay	130	757	887	312	0	312	505	0	505
Sierra	1299	771	2070	907	0	907	1478	0	1478
Stockton	270	392	662	287	0	287	340	7*	347
Greater Bay	1290	5738	7028	4133	0	4133	4133	0	4133
Greater Fresno	316	3162	3478	1471	11*	1482	2182	31*	2213
Kern	179	83	262	150	0	150	154	0	154
LA Basin ***	1969	4293	6262	4620	1756*	6376	6190	2160*	8350
Big Creek/Ventura ***	1161	2506	3667	2603	0	2603	2553	230*	2783
San Diego/ Imperial Valley ***	297	3872	4169	3363	700*	4063	3363	784*	4147
Total	6947	21745	28692	17973	2467	20440	21076	3212	24288

* No local area is “overall deficient”. Resource deficiency values result from a few deficient sub-areas; and since there are no resources that can mitigate this deficiency the numbers are carried forward into the total area needs. Resource deficient sub-area implies that in order to comply with the criteria, at summer peak, load may be shed immediately after the first contingency.

** Since “deficiency” cannot be mitigated by any available resource, the “Existing Capacity Needed” will be split among LSEs on a load share ratio during the assignment of local area resource responsibility.

*** More details are available in the LA Basin, Big Creek/Ventura and San Diego/Imperial Valley LCR study results sections on how LTPP Tracks 1 and 4 procurement, as well as repurposing demand response, can be used to mitigate resource deficiency.

The write-up for each Local Capacity Area lists important new projects included in the base cases as well as a description of reason for changes between the 2019 Long-Term LCR study and this 2024 Long-Term LCR study.

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	(MW) Requirement	Resources Needed (MW)	(MW)	Total SCE Selected Procurement for LTPP Tracks 1 & 4 (MW)	Additional Existing DR "Repurposed" Need ³⁰ (MW)
Category B (Single) ³¹	6,376	4,620	1,756	1,892	0
Category C (Multiple) ³²	8,350	6,190	2,160	1,892	268

9. Big Creek/Ventura Area

Area Definition

The transmission tie lines into the Big Creek/Ventura Area are:

- 1) Antelope #1 500/230 kV Transformer
- 2) Antelope #2 500/230 kV Transformer
- 3) Sylmar - Pardee 230 kV #1 and #2 Lines
- 4) Vincent - Pardee 230 kV #1 and #2 Line
- 5) Vincent - Santa Clara 230 kV Line

The substations that delineate the Big Creek/Ventura Area are:

- 1) Antelope 500 kV is out Antelope 230 kV is in
- 2) Antelope 500 kV is out Antelope 230 kV is in
- 3) Sylmar is out Pardee is in
- 4) Vincent is out Pardee is in
- 5) Vincent is out Santa Clara is in

Total 2024 busload within the defined area is 4,564 MW (includes 4,881 MW of forecasted demand as well as 311 MW of AAEE and 6 MW of LTPP EE) with 71 MW of losses and 362 MW pumps resulting in total load + losses + pumps of 4,997 MW.

³⁰ These are existing demand response beyond the 181 MW "fast" DR (located in the most effective locations in Southwestern LA Basin) that is needed to be "repurposed" for use to respond to contingency conditions. Because these are spread out at many locations, they do not correspond 1-for-1 MW need.

³¹ A single contingency means that the system will be able to survive the loss of a single element, however the operators will not have any means (other than load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by NERC transmission operations standards.

³² Multiple contingencies means that the system will be able to survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by NERC transmission operations standards.

The geographical representation of this local area does not match the electrical representation due to Saugas substation being included in the LA Basin geographical representation and not in Big Creek/Ventura. The total load within the geographical defined area is 3,673 MW (includes 3,915 MW of forecasted demand as well as 236 MW of AAEE and 6 MW of LTPP EE) with 71 MW of losses and 362 MW pumps resulting in total load + losses + pumps of 4,106 MW.

Total units and qualifying capacity available in the Big Creek/Ventura area:

MKT/SCHED RESOURCE ID	BUS #	BUS NAME	kV	NQC	UNIT ID	LCR SUB-AREA NAME	NQC Comments	CAISO Tag
ALAMO_6_UNIT	25653	ALAMO SC	13.8	14.58	1	Big Creek	Aug NQC	Market
BIGCRK_2_EXESWD	24306	B CRK1-1	7.2	19.38	1	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24306	B CRK1-1	7.2	21.03	2	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24307	B CRK1-2	13.8	21.03	3	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24307	B CRK1-2	13.8	30.39	4	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24308	B CRK2-1	13.8	49.48	1	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24308	B CRK2-1	13.8	50.64	2	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24309	B CRK2-2	7.2	18.22	3	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24309	B CRK2-2	7.2	19.19	4	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24310	B CRK2-3	7.2	16.55	5	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24310	B CRK2-3	7.2	18.02	6	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24311	B CRK3-1	13.8	34.09	1	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24311	B CRK3-1	13.8	34.09	2	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24312	B CRK3-2	13.8	34.09	3	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24312	B CRK3-2	13.8	39.93	4	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24313	B CRK3-3	13.8	37.99	5	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24314	B CRK 4	11.5	49.09	41	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24314	B CRK 4	11.5	49.28	42	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24315	B CRK 8	13.8	23.76	81	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24315	B CRK 8	13.8	42.85	82	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24317	MAMOTH1G	13.8	91.07	1	Big Creek, Rector, Vestal	Aug NQC	Market

BIGCRK_2_EXESWD	24318	MAMOTH2G	13.8	91.07	2	Big Creek, Rector, Vestal	Aug NQC	Market
BIGCRK_2_EXESWD	24323	PORTAL	4.8	9.35	1	Big Creek, Rector, Vestal	Aug NQC	Market
EASTWD_7_UNIT	24319	EASTWOOD	13.8	199.00	1	Big Creek, Rector, Vestal		Market
EDMONS_2_NSPIN	25605	EDMON1AP	14.4	25.00	1	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25606	EDMON2AP	14.4	25.00	2	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25607	EDMON3AP	14.4	25.00	3	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25607	EDMON3AP	14.4	25.00	4	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25608	EDMON4AP	14.4	25.00	5	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25608	EDMON4AP	14.4	25.00	6	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25609	EDMON5AP	14.4	25.00	7	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25609	EDMON5AP	14.4	25.00	8	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25610	EDMON6AP	14.4	25.00	9	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25610	EDMON6AP	14.4	25.00	10	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25611	EDMON7AP	14.4	25.00	11	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25611	EDMON7AP	14.4	25.00	12	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25612	EDMON8AP	14.4	25.00	13	Big Creek	Pumps	MUNI
EDMONS_2_NSPIN	25612	EDMON8AP	14.4	25.00	14	Big Creek	Pumps	MUNI
GLOW_6_SOLAR	29896	APPINV	0.42	0.00	EQ	Big Creek	Energy Only	Market
GOLETA_2_QF	24057	GOLETA	66	0.09		Ventura, S.Clara, Moorpark	Not modeled Aug NQC	QF/Selfgen
GOLETA_6_ELLWOD	29004	ELLWOOD	13.8	54.00	1	Ventura, S.Clara, Moorpark		Market
GOLETA_6_EXGEN	24057	GOLETA	66	1.37		Ventura, S.Clara, Moorpark	Not modeled Aug NQC	QF/Selfgen
GOLETA_6_GAVOTA	24057	GOLETA	66	0.82		Ventura, S.Clara, Moorpark	Not modeled Aug NQC	QF/Selfgen
GOLETA_6_TAJIGS	24057	GOLETA	66	2.89		Ventura, S.Clara, Moorpark	Not modeled Aug NQC	Market
LEBECS_2_UNITS	29051	PSTRIAG1	18	157.90	G1	Big Creek	Aug NQC	Market
LEBECS_2_UNITS	29052	PSTRIAG2	18	157.90	G2	Big Creek	Aug NQC	Market
LEBECS_2_UNITS	29053	PSTRIAS1	18	162.40	S1	Big Creek	Aug NQC	Market
LEBECS_2_UNITS	29054	PSTRIAG3	18	157.90	G3	Big Creek	Aug NQC	Market
LEBECS_2_UNITS	29055	PSTRIAS2	18	78.90	S2	Big Creek	Aug NQC	Market
LITLRK_6_SEPV01				0.00		Big Creek	Not modeled Energy Only	Market
MNDALY_6_MCGRTH	29306	MCGPKGEN	13.8	47.20	1	Ventura, S.Clara, Moorpark		Market
MNDALY_7_UNIT 3	24222	MANDLY3G	16	0.00	3	Ventura, S.Clara, Moorpark	Retired over 40 year	Market
MOORPK_2_CALABS	24099	MOORPARK	230	6.96		Ventura, Moorpark	Not modeled	Market
MOORPK_6_QF	24098	MOORPARK	66	26.56		Ventura, Moorpark	Not modeled Aug NQC	QF/Selfgen
MOORPK_7_UNITA1	24098	MOORPARK	66	2.03		Ventura, Moorpark	Not modeled Aug NQC	QF/Selfgen
NEENCH_6_SOLAR	29900	ALPINE_G	0.48	53.75	EQ	Big Creek	Aug NQC	Market
OMAR_2_UNIT 1	24102	OMAR 1G	13.8	77.25	1	Big Creek		QF/Selfgen
OMAR_2_UNIT 2	24103	OMAR 2G	13.8	77.25	2	Big Creek		QF/Selfgen
OMAR_2_UNIT 3	24104	OMAR 3G	13.8	77.25	3	Big Creek		QF/Selfgen
OMAR_2_UNIT 4	24105	OMAR 4G	13.8	77.25	4	Big Creek		QF/Selfgen
OSO_6_NSPIN	25614	OSO A P	13.2	2.38	1	Big Creek	Pumps	MUNI
OSO_6_NSPIN	25614	OSO A P	13.2	2.38	2	Big Creek	Pumps	MUNI
OSO_6_NSPIN	25614	OSO A P	13.2	2.38	3	Big Creek	Pumps	MUNI
OSO_6_NSPIN	25614	OSO A P	13.2	2.38	4	Big Creek	Pumps	MUNI
OSO_6_NSPIN	25615	OSO B P	13.2	2.38	5	Big Creek	Pumps	MUNI
OSO_6_NSPIN	25615	OSO B P	13.2	2.38	6	Big Creek	Pumps	MUNI

OSO_6_NSPIN	25615	OSO B P	13.2	2.38	7	Big Creek	Pumps	MUNI
OSO_6_NSPIN	25615	OSO B P	13.2	2.38	8	Big Creek	Pumps	MUNI
PANDOL_6_UNIT	24113	PANDOL	13.8	25.70	1	Big Creek, Vestal	Aug NQC	QF/Selfgen
PANDOL_6_UNIT	24113	PANDOL	13.8	20.94	2	Big Creek, Vestal	Aug NQC	QF/Selfgen
RECTOR_2_KAWEAH	24212	RECTOR	66	2.76		Big Creek, Rector, Vestal	Not modeled Aug NQC	Market
RECTOR_2_KAWH 1	24212	RECTOR	66	1.29		Big Creek, Rector, Vestal	Not modeled Aug NQC	Market
RECTOR_2_QF	24212	RECTOR	66	9.48		Big Creek, Rector, Vestal	Not modeled Aug NQC	QF/Selfgen
RECTOR_7_TULARE	24212	RECTOR	66	0.17		Big Creek, Rector, Vestal	Not modeled	QF/Selfgen
SAUGUS_2_TOLAND	24135	SAUGUS	66	0.00		Big Creek	Not modeled Energy Only	Market
SAUGUS_6_MWDFT H	24135	SAUGUS	66	4.08		Big Creek	Not modeled Aug NQC	MUNI
SAUGUS_6_PTCHGN	24118	PITCHGEN	13.8	18.95	D1	Big Creek	Aug NQC	MUNI
SAUGUS_6_QF	24135	SAUGUS	66	0.92		Big Creek	Not modeled Aug NQC	QF/Selfgen
SAUGUS_7_CHIQCN	24135	SAUGUS	66	2.02		Big Creek	Not modeled Aug NQC	Market
SAUGUS_7_LOPEZ	24135	SAUGUS	66	5.42		Big Creek	Not modeled Aug NQC	QF/Selfgen
SNCLRA_6_OXGEN	24110	OXGEN	13.8	35.70	D1	Ventura, S.Clara, Moorpark	Aug NQC	QF/Selfgen
SNCLRA_6_PROCGN	24119	PROCGEN	13.8	46.26	D1	Ventura, S.Clara, Moorpark	Aug NQC	Market
SNCLRA_6_QF	24127	S.CLARA	66	0.00	1	Ventura, S.Clara, Moorpark	Aug NQC	QF/Selfgen
SNCLRA_6_WILLMT	24159	WILLAMET	13.8	13.94	D1	Ventura, S.Clara, Moorpark	Aug NQC	QF/Selfgen
SPRGVL_2_QF	24215	SPRINGVL	66	0.23		Big Creek, Rector, Vestal	Not modeled Aug NQC	QF/Selfgen
SPRGVL_2_TULE	24215	SPRINGVL	66	0.59		Big Creek, Rector, Vestal	Not modeled Aug NQC	Market
SPRGVL_2_TULESC	24215	SPRINGVL	66	0.41		Big Creek, Rector, Vestal	Not modeled Aug NQC	Market
SYCAMR_2_UNITS	24143	SYCCYN1G	13.8	56.53	1	Big Creek	Aug NQC	QF/Selfgen
SYCAMR_2_UNITS	24144	SYCCYN2G	13.8	56.54	2	Big Creek	Aug NQC	QF/Selfgen
SYCAMR_2_UNITS	24145	SYCCYN3G	13.8	56.53	3	Big Creek	Aug NQC	QF/Selfgen
SYCAMR_2_UNITS	24146	SYCCYN4G	13.8	56.53	4	Big Creek	Aug NQC	QF/Selfgen
TENGEN_2_PL1X2	24148	TENNGEN1	13.8	17.49	D1	Big Creek	Aug NQC	Market
TENGEN_2_PL1X2	24149	TENNGEN2	13.8	17.50	D2	Big Creek	Aug NQC	Market
VESTAL_2_WELLHD	24116	VESTAL	13.8	49.00	1	Big Creek, Vestal		Market
VESTAL_6_QF	24152	VESTAL	66	6.91		Big Creek, Vestal	Not modeled Aug NQC	QF/Selfgen
VESTAL_6_ULTRGN	24150	ULTRAGEN	13.8	34.13	1	Big Creek, Vestal	Aug NQC	QF/Selfgen
VESTAL_6_WDFIRE	29008	LAKEGEN	13.8	6.60	1	Big Creek, Vestal	Aug NQC	QF/Selfgen
WARNE_2_UNIT	25651	WARNE1	13.8	38.00	1	Big Creek	Aug NQC	Market
WARNE_2_UNIT	25652	WARNE2	13.8	38.00	1	Big Creek	Aug NQC	Market
APPGEN_6_UNIT 1	24009	APPGEN1G	13.8	0.00	1	Big Creek	No NQC - hist. data	Market
APPGEN_6_UNIT 1	24010	APPGEN2G	13.8	0.00	2	Big Creek	No NQC - hist. data	Market
APPGEN_6_UNIT 1	24361	APPGEN3G	13.8	0.00	3	Big Creek	No NQC - hist. data	Market
NA	24326	EXGEN1	13.8	0.60	S1	Ventura, S.Clara, Moorpark	No NQC - hist. data	QF/Selfgen
NA	24340	CHARMIN	13.8	15.00	1	Ventura, S.Clara, Moorpark	No NQC - hist. data	QF/Selfgen

NA	24362	EXGEN2	13.8	0.80	G1	Ventura, S.Clara, Moorpark	No NQC - hist. data	QF/Selfgen
NA	24370	KAWGEN	13.8	2.80	1	Big Creek, Rector, Vestal	No NQC - hist. data	Market
NA	24372	KR 3-1	13.8	13.70	1	Big Creek, Vestal	No NQC - hist. data	QF/Selfgen
NA	24373	KR 3-2	13.8	12.90	1	Big Creek, Vestal	No NQC - hist. data	QF/Selfgen
NA	24422	PALMDALE	66	0.00	1	Big Creek	No NQC - hist. data	Market
New Unit	28019	RPS	13.8	50.00	1	Big Creek, Vestal	No NQC - Pmax	Market
New Unit	29884	DAWNGEN	0.82	20.00	EQ	Big Creek	No NQC - Pmax	Market
New Unit	29888	TWILGHTG	0.82	20.00	EQ	Big Creek	No NQC - Pmax	Market
New Unit	29918	VLYFLR_G	0.2	20.00	EQ	Big Creek	No NQC - Pmax	Market
New Unit	29952	CAMGEN	14.2	28.00	D1	Ventura, S.Clara, Moorpark	No NQC - Pmax	Market
New Unit	29954	RPS	66	10.00	EQ	Big Creek	No NQC - Pmax	Market
KERRGN_1_UNIT 1	24437	KERNRVR	66	0.00	1	Big Creek	Retired	Market
MNDALY_7_UNIT 1	24089	MANDLY1G	13.8	0.00	1	Ventura, Moorpark	Retired	Market
MNDALY_7_UNIT 2	24090	MANDLY2G	13.8	0.00	2	Ventura, Moorpark	Retired	Market
ORMOND_7_UNIT 1	24107	ORMOND1G	26	0.00	1	Ventura, Moorpark	Retired	Market
ORMOND_7_UNIT 2	24108	ORMOND2G	26	0.00	2	Ventura, Moorpark	Retired	Market
VESTAL_2_KERN	24152	VESTAL	66	0.00	1	Big Creek, Vestal	Retired	QF/Selfgen

Major new projects modeled: None

Critical Contingency Analysis Summary

Rector Sub-area:

The most critical contingency is the loss of the Rector - Vestal 230 kV line with the Eastwood unit out of service, which could thermally overload the remaining Rector - Vestal 230 kV line. This limiting contingency establishes a local capacity need of 560 MW (includes 10 MW of QF generation) as the minimum capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

The following table has units that have at least 5% effectiveness to the above-mentioned constraint within Rector sub-area:

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)
24370	KAWGEN	1	45
24319	EASTWOOD	1	41
24306	B CRK1-1	1	41
24306	B CRK1-1	2	41
24307	B CRK1-2	3	41
24307	B CRK1-2	4	41
24323	PORTAL	1	41
24308	B CRK2-1	1	40