

BP-20-E-JP01-01

Attachment 2 (AT02)

Tables and Charts

Table A2.1

Observations excluded from BPA's "Southern Intertie Data as of FY18"

FY-qtr: 2011-1 through 2018-3	Figure 6.1.1		Figure 6.3.1		Figure 7.1.1		Figure 7.2.1	
	Malin_MidC and NP_Malin		SP_Sylmar and Sylmar_MidC		COB_MidC and NP_COB: Day Ahead Peak		COB_MidC and NP_COB: Day Ahead Off-Peak	
	Included	Excluded	Included	Excluded	Included	Excluded	Included	Excluded
Total observations	57,851	12,260	56,670	13,441	2,222	236	2,567	355
Percent excluded		17%		19%		10%		12%

FY-qtr: 2011-1 through 2018-3	Figure 8.1.1		Figure 8.2.1		Figure 9.1 & 9.3	Figure 9.2 & 9.4
	NOB_MidC and SP_NOB: Day Ahead		NOB_MidC and SP_NOB: Day Ahead		Real Time on COI	Real Time on PDCI
	Included	Excluded	Included	Excluded	Excluded Hours	
Total observations	2,239	219	2,532	390		
Percent excluded		9%		13%	43%	67%

Source: JP01-BPA-28-68.

Chart A2.2

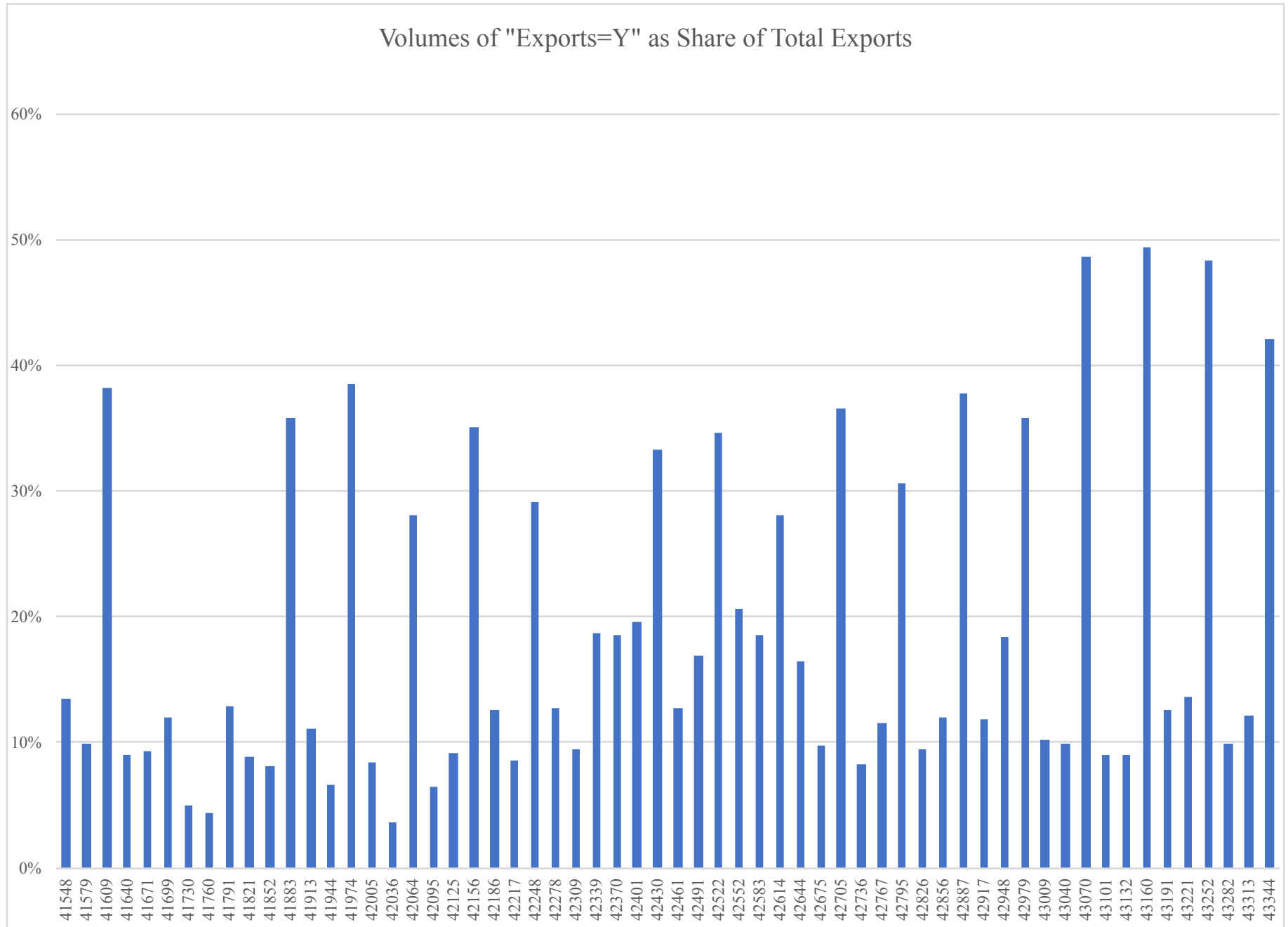


Table A2.3
Estimated Impacts on SMUD's Variable Costs

Estimated Coefficients									
	Local Thermal Options								
	Using only observations where MW/hour > 20					Using synthetic heat rate function for SMUD's thermal generation			
Variable	F1	F2	F4	F5		F1	F2	F4	F5
B ₀ t	41 804.86 (130.77)	6 593.131 (19.10)	9.969222 (1484.67)	6 365.941 (15.69)		66 149.08 (130.50)	9 808.324 (19.31)	10.28557 (1163.19)	10 357.65 (18.55)
B ₁ t	1 039.532 (6.90)	282.5053 (2.51)	.0415119 (17.85)	339.0256 (2.58)		3 608.887 (14.82)	1 216.4 (6.97)	.0170593 (5.31)	1 195.087 (6.01)
B ₂ t	-927.2859 (-4.95)	-278.1751 (-1.99)	-.0105089 (-3.66)	-.286.3917 (-1.78)		-1 197.229 (- 4.14)	-510.4707 (-2.47)	-.008735 (-2.32)	-519.3022 (-2.29)
B ₃ t	-23.96279 (-43.55)	-3.503778 (-8.12)	-.0000928 (-5.62)	-3.552206 (-7.48)		-14.38689 (- 18.27)	-3.201851 (-5.61)	-.000112 (-5.47)	-3.448739 (-5.30)
B ₄ t	-4.276959 (-19.42)	-.7004963 (-4.33)	-.0001158 (-5.69)	-.7597142 (-4.16)		-5.675938 (- 18.42)	-1.242214 (-5.74)	-.0000409 (- 1.58)	-2.090208 (-8.84)
B ₅ t		.3403294 (45.19)	-.0000841 (-4.92)	.2609194 (30.99)			0.3089728 (42.03)	1.11e-06 (0.05)	0.3053347 (36.81)
B ₆ t		.3929442 (50.25)	-.0000404 (-3.31)	.3857927 (45.74)			0.2353426 (31.17)	-.0000602 (- 3.69)	0.2228412 (26.2)
B ₇ t		-.0612201 (-7.39)	-.0000122 (-0.98)	-.0556262 (-6.22)			0.1542386 (20.43)	.000049 (3.00)	0.1415791 (16.53)
B ₈ t		.0387616 (5.59)	.0000149 (136.25)	.0020839 (0.23)			0.0761475 (10.41)	.0000116 (132.60)	0.05889 (6.93)
B ₉ t		.1309175 (21.55)		.0789314 (8.89)			0.0748053 (10.77)		0.0557878 (6.69)
B ₁₀ t				.0495017 (5.62)					-0.0015184 (-0.18)
B ₁₁ t				.0219693 (2.47)					0.0188961 (2.34)
B ₁₂ t				.0314583 (4.21)					0.0218714 (2.8)
B ₁₃ t				.0734949 (10.64)					0.0379066 (5.06)
R ²	0.0792	0.5752	0.5551	0.5559		0.0486	0.5983	0.5017	0.5955
AIC	483 266.6	367 701.7	-18 647.5	291 218.3		502 892.1	381 798.5	-7 850.863	300 911.6

F1: $TVC = B_0 + B_1RateIncrease + B_2SellerConc + B_3Hydro + B_4RetailLoad$

F2: $TVC = B_0 + B_1RateIncrease + B_2SellerConc + B_3Hydro_{T-1} + B_4RetailLoad_{T-1} + B_5TVC_{T-1} + B_6TVC_{T-2} + B_7TVC_{T-3} + B_8TVC_{T-4} + B_9TVC_{T-5}$

F3: $(TVC - TVC_{T-1}) = B_0 + B_1RateIncrease + B_2(SellerConc - SellerConc_{T-1}) + B_3(Hydro - Hydro_{T-1}) + B_4(RetailLoad - RetailLoad_{T-1}) + B_5 *$

F4: $\ln(TVC) = B_0 + B_1RateIncrease_{T-1} + B_2SellerConc_{T-1} + B_3Hydro_{T-1} + B_4Hydro_{T-2} + B_5Hydro_{T-3} + B_6RetailLoad_{T-1} + B_7RetailLoad_{T-2} + B_8CostOfTherm_{T-1}$

F5: $TVC = B_0 + B_1RateIncrease + B_2SellerConc + B_3Hydro + B_4RetailLoad + B_5TVC_{T-1} + B_6TVC_{T-2} + B_7TVC_{T-3} + B_8TVC_{T-4} + B_9TVC_{T-5} + B_{10}TVC_{T-6} + B_{11}TVC_{T-7} + B_{12}TVC_{T-8} + B_{13}TVC_{T-9}$

Table A2.3 (cont.)

Estimated Annual Cost to SMUD of BPA Transmission Rate Increase on 10/01/17									
	Local Thermal Options								
	MW/hour > 20					Synthetic Heat Rate			
	F1	F2	F4**	F5		F1	F2	F4**	F5
B ₁	1 039.53	282.51	.0415	339.03		3 608.887	1 216.4	.0170593	1 195.087
B ₁ s.d.	150.7085	112.4911	.002325	131.5635		243.5199	174.6148	.0032106	198.8646
B ₁ 95% C.I.	(744.13, 1334.93)	(62.01, 503.00)	(.0370, .0461)	(81.14, 596.91)		(3 131.572, 4 086.203)	(874.1383, 1 558.662)	(0.01076, 0.023352)	(805.2862, 1584.888)
B ₁ in \$/hr	\$1,039.53	\$282.51	4.15% increase per hour	\$339.03		\$3 608.89	\$1 216.40	1.71% increase per hour	\$1 195.09
B ₁ in \$/yr***	\$9.106 million	\$2.475 million	4.15% increase per year	\$2.970 million		\$31.614 million	\$10.656 million	1.71% increase per year	\$10.469 million
Min. annual impact	\$6.519 million	\$543.2 thou	3.7% increase per year	\$710.8 thousand		\$27.433 million	\$7.657 million	1.1% increase per year	\$7.054 million
Max. annual impact	\$11.694 million	\$4.406 million	4.61% increase per year	\$5.229 million		\$35.795 million	\$13.654 million	2.34% increase per year	\$13.884 million
Min. of all min.		\$543.2 thousand							\$7.054 million
Max. of all max.	\$11.694 million					\$35.795 million			

* This form is not statistically significant

** Coefficients represent percent change

*** \$/hr * 8,760 hours/year

Table A2.4
Summary Statistics for Exogenous Variables

	CA Carbon	Mid-C	COB	NOB	NP15	SP15		
Averages	Price	Temperature	Temperature	Temperature	Temperature	Temperature	COB OTC (AC)	NOB OTC (DC)
<10.1.17	\$ 12.67	12.92	21.85	20.33	21.85	7.41	4,011	1,931
>=10.1.17	\$ 13.89	15.24	27.70	24.87	27.70	9.63	4,231	2,581
Change in means	\$ 1.22	2.32	5.85	4.54	5.85	2.22	220	649
Standard Deviations								
<10.1.17	0.03	4.86	5.92	5.97	5.92	2.72	672	325
>=10.1.17	1.12	8.92	12.29	10.31	12.29	4.30	651	1,047
	Mid-C Non-	COB Non-	NOB Non-	NP15 Non-	SP15 Non-	Mid-C		COB Hydro
Averages	Dispatchable	Dispatchable	Dispatchable	Dispatchable	Dispatchable	Elevation	Mid-C Hydro	Flows (Dalles +
<10.1.17	125,285	139,943	179,757	14,658	54,472	(Coulee)	Flows (Dalles)	NoCal)
>=10.1.17	135,913	152,714	203,959	17,012	68,529	1,252	187,871	188,580
Change in means	10,628	12,771	24,202	2,354	14,057	1,274	192,716	193,459
						22	4,845	4,879
Standard Deviations								
<10.1.17	24,740	23,022	27,913	6,475	13,467	3	26,714	26,765
>=10.1.17	27,336	29,611	44,538	8,891	26,328	16	98,344	98,369
	NG Price			NG Price				
	(Stanfield,	NG Price (Henry	NG Price	(Malin,	NG Price			
Averages	Kingsgate)	Hub)	(Henry Hub)	CityGate)	(Needles)			
<10.1.17	\$ 4.73	\$ 2.73	\$ 2.73	\$ 5.48	\$ 2.60			
>=10.1.17	\$ 4.59	\$ 2.72	\$ 2.72	\$ 5.44	\$ 2.53			
Change in means	\$ (0.14)	\$ (0.02)	\$ (0.02)	\$ (0.04)	\$ (0.08)			
Standard Deviations								
<10.1.17	0.29	0.15	0.15	0.32	0.32			
>=10.1.17	0.90	0.48	0.48	0.84	0.47			

Table A2.5

Transaction Counts, FY14-18			
	Total	Negative	Share < 0
Total transactions (all hubs, all terms)	189,136		
Hourly only			
Mid-C transactions not null	36,211		
Export transactions not null	151,272		
COB not null	43,168		
NOB not null	34,840		
NP15 not null	32,165		
SP15 not null	41,099		
COB minus Mid-C Hourly		7,332	17%
NOB minus Mid-C Hourly		5,240	15%
NP15 minus Mid-C Hourly		3,405	11%
SP15 minus Mid-C Hourly		6,117	15%
Daily only			
Mid-C transactions not null	42,218		
Export transactions not null	102,656		
COB not null	23,360		
NOB not null	34,835		
NP15 not null	15,556		
SP15 not null	28,905		
COB minus Mid-C Hourly		1,577	7%
NOB minus Mid-C Hourly		5,632	16%
NP15 minus Mid-C Hourly		1,691	11%
SP15 minus Mid-C Hourly		3,126	11%

Table A2.6**Net Effect on BPA due to 2017 Tx Rate Increase**

Cost Savings	FY18	Mid-C price change due to BP-18	Cost Reductions due to BP-18
BPA DA Purchases at Mid-C	613,953	\$ (7.87)	\$ (4,831,810)
BPA RT Purchases at Mid-C	111,589	\$ (5.20)	\$ (580,263)
			\$ (5,412,073)

Source: FY18 - Total MWh Bought by POD by Buyer (EQRs from FERC)

Total MWh Sold by BPA by Hub by Term in FY18			
	COB	Mid-C	NOB
DA=D	1,835,690	4,700,716	329,762
RT=H,5,15	635,787	27,645	414,916

Source: FY18 - Total MWh Sold By POD By Seller (EQRs from FERC)

Price Changes due to 2017 Tx Rate Increase			
	COB	Mid-C	NOB
DA \$	(5.41) \$	(7.91) \$	(4.86)
RT \$	0.35 \$	(5.20) \$	(2.17)

Source: BP-18-E-J01-02

Net Effect on BPA due to 2017 Tx Rate Increase			
DA Lost Revenues	\$ (9,940,151)	\$ (37,189,057)	\$ (1,602,703)
RT Lost Revenues	\$ 220,443	\$ (143,862)	\$ (900,700)
			\$ (49,556,028)
Cost Savings			\$ 5,412,073
		Net Effect on BPA	\$ (44,143,955)

Table A2.7
N_S_Hourly (MWh/hour)

