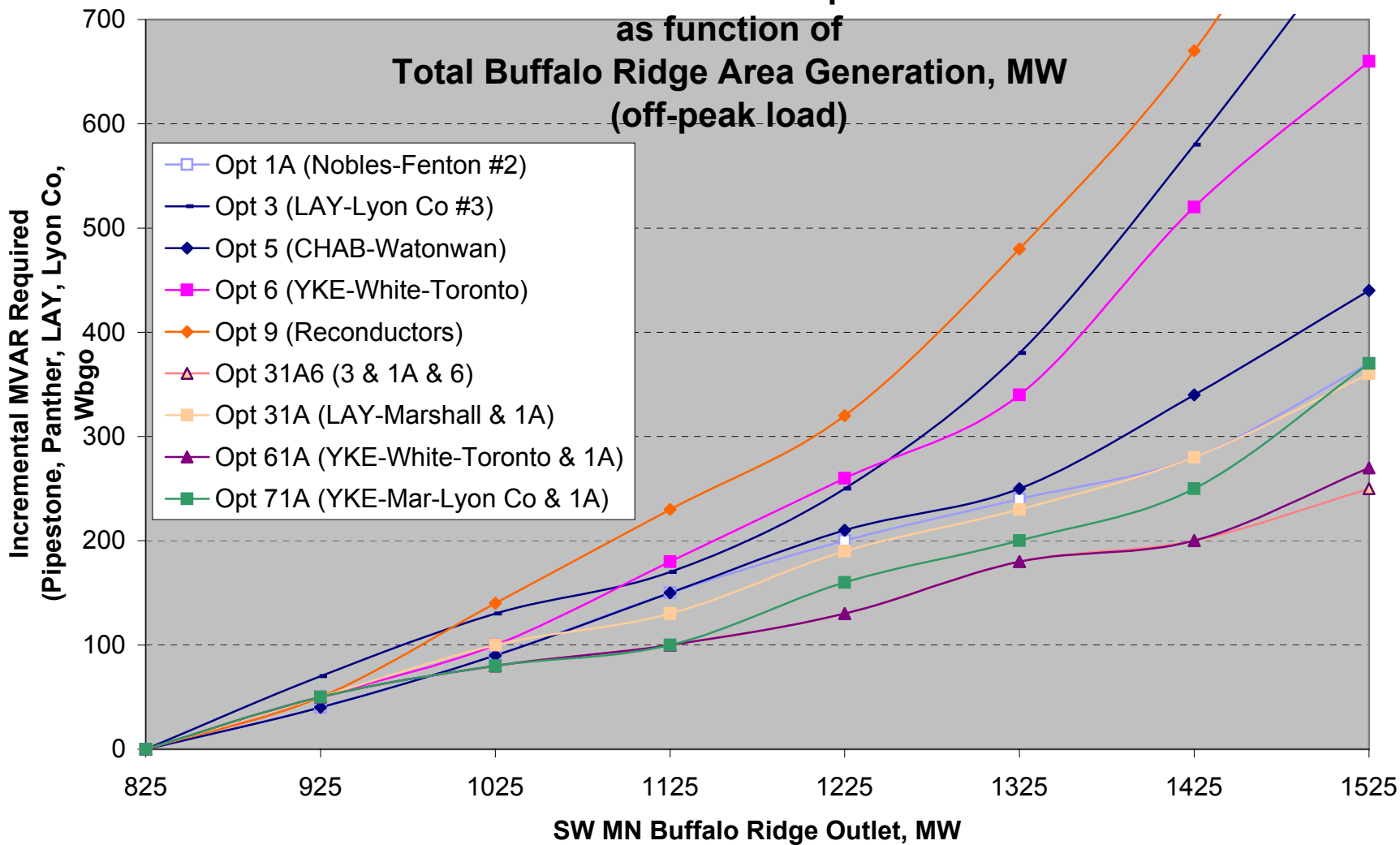


## Comparison of Transmission Options' Incremental MVAR Requirements



Buffalo Ridge Incremental Generation Outlet Study  
Reactive additions required, MVAR

Buff Ridge MW: 825 Option	925							1025					1125					1225					1325						
	PIP	PTH	LAY	LYC	WBG	TOT	PIP	PTH	LAY	LYC	WBG	TOT	PIP	PTH	LAY	LYC	WBG	TOT	PIP	PTH	LAY	LYC	WBG	TOT	PIP	PTH	LAY	LYC	
1A	0	0	40	0	0	0	40	0	50	20	0	20	90	0	70	40	0	40	150	0	90	50	0	60	200	0	120	60	0
3	0	0	50	20	0	0	70	20	60	30	0	20	130	40	70	40	0	20	170	60	90	60	0	40	250	140	90	80	30
5	0	0	40	0	0	0	40	0	50	20	0	20	90	0	70	40	0	40	150	0	90	60	0	60	210	20	90	80	0
6	0	0	50	0	0	0	50	0	60	20	0	20	100	20	80	40	0	40	180	40	120	60	0	40	260	100	120	80	0
9	0	0	40	10	0	0	50	20	50	20	30	20	140	60	60	40	30	40	230	100	90	60	30	40	320	180	120	80	60
31A	0	0	50	0	0	0	50	0	60	20	0	20	100	0	70	40	0	20	130	0	90	60	0	40	190	0	110	80	0
61A	0	0	50	0	0	0	50	0	60	0	0	20	80	0	80	0	0	20	100	0	90	0	0	40	130	0	120	0	0
71A	0	0	50	0	0	0	50	0	60	0	0	20	80	0	80	0	0	20	100	0	120	0	0	40	160	0	120	20	0
31A6	0	0	50	0	0	0	50	0	60	0	0	20	80	0	80	0	0	20	100	0	90	0	0	40	130	0	120	20	0

Difference w/r to Option 1A (MVAR)

1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	10	20	0	0	30	20	10	10	0	0	40	40	0	0	0	-20	20	60	0	10	0	-20	50	140	-30	20	30	
							\$0.6						\$0.8						\$0.4						\$1.0					
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	20	-30	20	0	
							\$0.0						\$0.0						\$0.0						\$0.2					
6	0	0	10	0	0	0	10	0	10	0	0	0	10	20	10	0	0	0	30	40	30	10	0	-20	60	100	0	20	0	
							\$0.2						\$0.2						\$0.6						\$1.2					
9	0	0	0	10	0	0	10	20	0	0	30	0	50	60	-10	0	30	0	80	100	0	10	30	-20	120	180	0	20	60	
							\$0.2						\$1.0						\$1.6						\$2.4					
31A	0	0	10	0	0	0	10	0	10	0	0	0	10	0	0	0	0	-20	-20	0	0	10	0	-20	-10	0	-10	20	0	
							\$0.2						\$0.2						-\$0.4						-\$0.2					
61A	0	0	10	0	0	0	10	0	10	-20	0	0	-10	0	10	-40	0	-20	-50	0	0	-50	0	-20	-70	0	0	-60	0	
							\$0.2						-\$0.2						-\$1.0						-\$1.4					
71A	0	0	10	0	0	0	10	0	10	-20	0	0	-10	0	10	-40	0	-20	-50	0	30	-50	0	-20	-40	0	0	-40	0	
							\$0.2						-\$0.2						-\$1.0						-\$0.8					
31A6	0	0	10	0	0	0	10	0	10	-20	0	0	-10	0	10	-40	0	-20	-50	0	0	0	-50	0	-20	-70	0	0	-40	0
							\$0.2						-\$0.2						-\$1.0						-\$1.4					

WBG	TOT	1425					TOT	1525					TOT
		PIP	PTH	LAY	LYC	WBG		PIP	PTH	LAY	LYC	WBG	
60	240	0	120	80	0	80	280	20	120	100	30	100	370
40	380	240	120	100	60	60	580	380	150	120	90	60	800
60	250	40	120	100	0	80	340	60	150	120	30	80	440
40	340	180	150	100	30	60	520	300	150	120	30	60	660
40	480	300	120	100	90	60	670	440	150	140	120	80	930
40	230	0	120	100	0	60	280	0	150	120	30	60	360
60	180	0	120	20	0	60	200	0	150	40	0	80	270
60	200	0	150	40	0	60	250	20	180	60	30	80	370
40	180	0	120	20	0	60	200	0	150	40	0	60	250
0	0	0	0	0	0	0	0	0	0	0	0	0	0
-20	140 \$2.8	240	0	20	60	-20	300 \$6.0	360	30	20	60	-40	430 \$8.6
0	10 \$0.2	40	0	20	0	0	60 \$1.2	40	30	20	0	-20	70 \$1.4
-20	100 \$2.0	180	30	20	30	-20	240 \$4.8	280	30	20	0	-40	290 \$5.8
-20	240 \$4.8	300	0	20	90	-20	390 \$7.8	420	30	40	90	-20	560 ####
-20	-10 -\$0.2	0	0	20	0	-20	0 \$0.0	-20	30	20	0	-40	-10 -\$0.2
0	-60 -\$1.2	0	0	-60	0	-20	-80 -\$1.6	-20	30	-60	-30	-20	-100 -\$2.0
0	-40 -\$0.8	0	30	-40	0	-20	-30 -\$0.6	0	60	-40	0	-20	0 \$0.0
-20	-60 -\$1.2	0	0	-60	0	-20	-80 -\$1.6	-20	30	-60	-30	-40	-120 -\$2.4