

Black Dog 6 - 2018 In-Service

In-Service		March 1, 2018																																							
Operating Life (Years)		35																																							
Capital (\$000)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
2013 \$dollars	[TRADE SECRET DATA BEGINS...]																																								
Escalation Rate																																									
Construction Expenditures	No Inflation, No Escalation																																								
On-Going Capital																																									
Transmission	No Inflation, No Escalation																																								
Natural Gas Pipeline																																									
Operating & Maintenance Expense																																									
2013 \$dollars																																									
Escalation Rate																																									
Fixed O&M (\$000)																																									
2013 \$dollars																																									
Escalation Rate																																									
Variable O&M (\$/MWh)																																									
Fuel Supply Expense																																									
Nominal \$dollars																																									
Firm Service Annual Fixed Charge (\$000)	Modeled as a Fixed annual capacity rate																																								
Ventura Hub Forecast (\$/mmBtu)	4.83	5.24	5.59	5.87	6.14	6.56	6.78	7.02	7.23	7.39	7.55	7.78	7.96	8.11	8.29	8.49	8.68	8.89	9.06	9.24	9.42	9.6	9.78	9.97	10.17	10.36	10.56	10.77	10.98	11.19	11.41	11.63	11.85	[TRADE SECRET DATA ENDS]							
Volumetric Charge (\$/mmBtu)	[TRADE SECRET DATA BEGINS...]																																								
Loss (% of volume)																																									
Total Delivered Price Of Gas (\$/mmBtu)																																									
Maximum Capacity																																									
Winter (Dec-Feb)																																									
Shoulder (March-May & Sept-Nov)																																									
Summer (June-Aug)																																									
Heat Rate Profile																																									
% of Maximum Capacity																																									
1	50%																																								
2	60%																																								
3	70%																																								
4	80%																																								
5	90%																																								
6	100%																																								
7																																									
Average Heat Rate																																									
Emission Rates																																									
SO2 - lbs/MWh																																									
NOx - lbs/MWh																																									
CO2 - lbs/mmBtu																																									
HG - lbs/MWh																																									
PM10 - lbs/MWh																																									
CO - lbs/MWh																																									
Pb - lbs/MWh																																									
Planned Maintenance (weeks/yr)																																									
Forced Outage Rate (%)																																									
[TRADE SECRET DATA ENDS]																																									

Invenergy Cannon Falls

In-Service
 PPA Term (Years)

2014	2015	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2037	2038
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036		

Net Capability (NC)	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW	178.4 MW		
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Capacity Payments (CP)	[TRADE SECRET DATA BEGINS...]																							
Consumer Price Index Forecast																								
2016 Capacity Price \$/kW-mo																								
Nominal Capacity Price \$/kW-mo																								

Monthly Capacity Payments = NC x CAF x (CP + EICA)

Seasonal Derivation Profile																								
Seasonal Net Capability																								
Schedule Maintenance Energy (SME)																								
Expected Forced Outage Rate (EFOR)																								
Force Outage Energy (FOE) = EFOR x Seasonal NC x Hours																								
Available Energy (AE) = Seasonal NC x Hours - SME - FOE																								
Period Energy (PE) = NC x Hours																								
Capacity Availability Factor = CAF = (AE+SME)/PE																								

Capacity Payments (reflects mid-yr change) Modeled as a capacity																								
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Payment for Excess Capacity

2015	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2037	2038
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036		

Payment For Variable O&M and Start Charges

Consumer Price Index Forecast																								
2016 Monthly Tolling Price																								
Nominal Tolling Price (reflects mid year change)																								

Turbine Start Payments

Consumer Price Index Forecast																								
2016 Turbines Start Price (TSP)																								
Nominal TSP																								
Assumed # of Run Hours per Start																								
Equivalent Start Charge Per MWh																								
Total VOM Input for Strategist																								

Fuel Supply Expense

Nominal Dollars																								
Firm Service Annual Fixed Charge (\$000)																								
Ventura Hub Forecast (\$/mmBtu)	\$4.08	\$4.36	\$4.83	\$5.24	\$5.59	\$5.87	\$6.14	\$6.56	\$6.78	\$7.02	\$7.23	\$7.39	\$7.55	\$7.78	\$7.96	\$8.11	\$8.29	\$8.49	\$8.68	\$8.89	\$9.06			
Winter	[TRADE SECRET DATA BEGINS...]																							
Volumetric Charge (\$/mmBtu)																								
Loss (% of volume)																								
Total Delivered Price Of Gas (\$/mmBtu)																								
Summer																								
Volumetric Charge (\$/mmBtu)																								
Loss (% of volume)																								
Total Delivered Price Of Gas (\$/mmBtu)																								
Average																								
Volumetric Charge (\$/mmBtu)																								
Loss (% of volume)																								
Total Delivered Price Of Gas (\$/mmBtu)																								

Heat Rate Profile

% of Maximum Capacity	1	2	3	4	5	6	7
	50%	60%	70%	80%	90%	100%	0%
Average Heat Rate (mmBtu/MWh)							
Emission Rates							
	SO2 - lbs/MWh						
	NOx - lbs/MWh						
	CO2 - lbs/mmBtu						
	Hg - lbs/MWh						
	PM10 - lbs/MWh						
	CO - lbs/MWh						
	Pb - lbs/MWh						

Planned Maintenance (weeks/yr)																								
Forced Outage Rate (%)																								

[TRADE SECRET DATA ENDS]

Invenergy Hampton Energy Center

In-Service June 1, 2016
 PPA Term (Years) 20

2014	2015	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2037
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	
Net Capacity (NC)		357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	357.5 MW	

Capacity Payments (CP)		[TRADE SECRET DATA BEGINS...]																				
Consumer Price Index Forecast																						
2016 Capacity Price \$/kW-mo																						
Nominal Capacity Price \$/kW-mo																						

Monthly Capacity Payments = NC x CAF x (CP + EICA)		Average	31	28	31	30	31	30	31	30	31	30	31	30	31
Seasonal Deration Profile		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Seasonal Net Capability															
Schedule Maintenance Energy (SME)															
Expected Forced Outage Rate (EFOR)															
Force Outage Energy (FOE) = EFOR x Seasonal NC x Hours															
Available Energy (AE) = Seasonal NC x Hours - SME - FOE															
Period Energy (PE) = NC x Hours															
Capacity Availability Factor = CAF = (AE+SME)/PE															

2015	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2037	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036		
Total Capacity Payments (reflects mid-yr change)																							

Payment for Excess Capacity																						
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2015	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2037	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036		
Payment For Variable O&M and Start Charges																							
Consumer Price Index Forecast																							
2016 Monthly Tolling Price																							
Nominal Tolling Price (reflects mid year change)																							

Turbine Start Payments																						
Consumer Price Index Forecast																						
2016 Turbines Start Price (TSP)																						
Nominal TSP																						
Assumed # of Run Hours per Start																						
Equivalent Start Charge Per MWh																						
Total VOM Input for Strategist																						

Fuel Supply Expense																							
Nominal \$dollars																							
Firm Service Annual Fixed Charge (\$000)																							
Ventura Hub Forecast (\$/mmBtu)		\$4.08	\$4.36	\$4.83	\$5.24	\$5.59	\$5.87	\$6.14	\$6.56	\$6.78	\$7.02	\$7.23	\$7.39	\$7.55	\$7.78	\$7.96	\$8.11	\$8.29	\$8.49	\$8.68	\$8.89	\$9.06	
Winter		[TRADE SECRET DATA BEGINS...]																					
Volumetric Charge (\$/mmBtu)																							
Loss (% of volume)																							
Total Delivered Price Of Gas (\$/mmBtu)																							
Summer																							
Volumetric Charge (\$/mmBtu)																							
Loss (% of volume)																							
Total Delivered Price Of Gas (\$/mmBtu)																							
Average																							
Volumetric Charge (\$/mmBtu)																							
Loss (% of volume)																							
Total Delivered Price Of Gas (\$/mmBtu)																							

Heat Rate Profile		% of Maximum Capacity		Average Heat Rate (mmBtu/MWh)		Emission Rates	
1	50%					SO2 - lbs/MWh	
2	80%					NOx - lbs/MWh	
3	100%					CO2 - lbs/mmBtu	
4	0%					HG - lbs/MWh	
5	0%					PM10 - lbs/MWh	
6	0%					CO - lbs/MWh	
7	0%					Pb - lbs/MWh	

2015	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2037	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036		
Planned Maintenance (weeks/yr)																							
Forced Outage Rate (%)																							

[TRADE SECRET DATA ENDS]

Calpine Mankato Expansion

In-Service	June 1, 2017
PPA Term (Years)	20

	2014	2015	2016	¹ 2017	² 2018	³ 2019	⁴ 2020	⁵ 2021	⁶ 2022	⁷ 2023	⁸ 2024	⁹ 2025	¹⁰ 2026	¹¹ 2027	¹² 2028	¹³ 2029	¹⁴ 2030	¹⁵ 2031	¹⁶ 2032	¹⁷ 2033	¹⁸ 2034	¹⁹ 2035	²⁰ 2036	²¹ 2037	2038	2039	2040	2041
Net Capability (NC)				345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW	345.0 MW				

Seasonal Deration				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Capacity Payments (CP)																													
Nominal Capacity Price \$/kW-mo																													

		2015	2016	¹ 2017	² 2018	³ 2019	⁴ 2020	⁵ 2021	⁶ 2022	⁷ 2023	⁸ 2024	⁹ 2025	¹⁰ 2026	¹¹ 2027	¹² 2028	¹³ 2029	¹⁴ 2030	¹⁵ 2031	¹⁶ 2032	¹⁷ 2033	¹⁸ 2034	¹⁹ 2035	²⁰ 2036	²¹ 2037	2038	2039	2040	2041	
Total Capacity Payments (reflects mid-yr change)																													

Energy Payments and Start Charges		2015	2016	¹ 2017	² 2018	³ 2019	⁴ 2020	⁵ 2021	⁶ 2022	⁷ 2023	⁸ 2024	⁹ 2025	¹⁰ 2026	¹¹ 2027	¹² 2028	¹³ 2029	¹⁴ 2030	¹⁵ 2031	¹⁶ 2032	¹⁷ 2033	¹⁸ 2034	¹⁹ 2035	²⁰ 2036	²¹ 2037	2038	2039	2040	2041	
Consumer Price Index Forecast																													
2012 Energy Payment (\$/MWh)																													
Nominal Tolling Price (reflects mid year change)																													
Turbine Start Payments																													
Consumer Price Index Forecast																													
2012 Turbines Start Price (TSP)																													
Nominal TSP (reflects mid yr change)																													
Assumed # of Run Hours per Start																													
Equivalent Start Charge Per MWh																													
Total VOM Input for Strategist (\$/MWh)																													

Fuel Supply Expense																													
Nominal \$dollars																													
Firm Service Annual Fixed Charge (\$000)																													
Ventura Hub Forecast (\$/mmBtu)				\$4.36	\$4.83	\$5.24	\$5.59	\$5.87	\$6.14	\$6.56	\$6.78	\$7.02	\$7.23	\$7.39	\$7.55	\$7.78	\$7.96	\$8.11	\$8.29	\$8.49	\$8.68	\$8.89	\$9.06	\$9.24					
Winter																													
Volumetric Charge (\$/mmBtu)																													
Loss (% of volume)																													
Total Delivered Price Of Gas (\$/mmBtu)																													
Summer																													
Volumetric Charge (\$/mmBtu)																													
Loss (% of volume)																													
Total Delivered Price Of Gas (\$/mmBtu)																													
Average																													
Volumetric Charge (\$/mmBtu)																													
Loss (% of volume)																													
Total Delivered Price Of Gas (\$/mmBtu)																													

Heat Rate Profile	% of Maximum Capacity	Average Heat Rate (mmBtu/MWh)	Emission Rates
1	51%		SO2 - lbs/MWh
2	84%		NOx - lbs/MWh
3	100%		CO2 - lbs/mmBtu
4	0%		HG - lbs/MWh
5	0%		PM_10 - lbs/MWh
6	0%		CO - lbs/MWh
7	0%		Pb - lbs/MWh

		2015	2016	¹ 2017	² 2018	³ 2019	⁴ 2020	⁵ 2021	⁶ 2022	⁷ 2023	⁸ 2024	⁹ 2025	¹⁰ 2026	¹¹ 2027	¹² 2028	¹³ 2029	¹⁴ 2030	¹⁵ 2031	¹⁶ 2032	¹⁷ 2033	¹⁸ 2034	¹⁹ 2035	²⁰ 2036					
Planned Maintenance (weeks/yr)																												
Forced Outage Rate (%)																												

TRADE SECRET DATA ENDS]

Geronimo Distributed Solar Project

In-Service December 1, 2016
PPA Term (Years) 20

	2014	2015	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054															
Net Capability (NC)			100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW	100 MW																																	
Pricing Option 1																																																								
Capacity Payments (CP)			Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20																																		
Nominal Capacity Price \$/kW-mo			[TRADE SECRET DATA BEGINS...]																																																					
Total Capacity Payments (reflects mid-yr change)			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054															
Energy Payments			Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20																																		
Nominal \$			[TRADE SECRET DATA BEGINS...]																																																					
Total Energy Payments (reflects mid-yr change)			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054															
Pricing Option 2 (Strategist Inputs)																																																								
Energy Payments			Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20																																		
Nominal \$			[TRADE SECRET DATA BEGINS...]																																																					
Total Energy Payments (reflects mid-yr change)			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054															
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GRE Capacity Purchase

In-Service	June 1, 2016
PPA Term (Years)	3

Option 1

Net Capability (NC)

<i>1</i>	<i>2</i>	<i>3</i>
2016	2017	2018
100 MW	100 MW	100 MW

Capacity Payments (CP)

Nominal Capacity Price \$/kW-mo

2016/17	2017/18	2018/19
[TRADE SECRET DATA BEGINS]		

Total Capacity Payments (reflects mid-yr change)

2016	2017	2018	2019

_TRADE SECRET DATA ENDS]****

Option 2

Net Capability (NC)

2016	2017	2018
200 MW	200 MW	200 MW

Capacity Payments (CP)

Nominal Capacity Price \$/kW-mo

2016/17	2017/18	2018/19
[TRADE SECRET DATA BEGINS]		

Total Capacity Payments (reflects mid-yr change)

2016	2017	2018	2019

_TRADE SECRET DATA ENDS]****