

PUBLIC DOCUMENT -- TRADE SECRET DATA HAS BEEN EXCISED

OAG Comments - February 20, 2019

MP Discount Rate	7.06%	Exhibit 3
Transmission Losses (PY19-20)	6.00%	

		<b>[TRADE SECRET DATA BEGINS]</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
CT Energy Cost	Fuel Cost (\$/MMBtu)				
	Heat Rate (M [TRADE SECRET DATA BEGINS])		9.8	9.8	9.8
	VOM (\$/MWh)				
	Major (\$/MWh)				
	Energy Cost (\$/MWh)		\$35.44	\$32.78	\$32.63
	Energy Cost (Grossed Up) (\$/MWh)		\$37.56	\$34.75	\$34.58
	<b>Energy Cost (Levelized) (\$/MWh)</b>		<b>\$40.86</b>		
Product B	Contract Energy Curtailment Price (\$/MWh)		\$30.00	\$30.00	\$30.00
	Customer Savings (Levelized) (\$/MWh)		\$10.86		
	Customer Savings (Annual) (\$/MWh)		\$7.56	\$4.75	\$4.58
	<b>Total Savings (Levelized) (\$)</b>		<b>\$9,776,764</b>		
	Total Savings (Annual) (\$)		\$680,579	\$427,622	\$412,533
	Summation (\$)		\$10,663,650		

2022	2023	2024	2025	2026	2027	2028	
[REDACTED]							
9.8	9.8	9.8	9.8	9.8	9.8	9.8	TRADE SE
[REDACTED]							
\$35.71	\$38.58	\$39.67	\$41.64	\$45.20	\$46.44	\$46.70	TRADE SE
\$37.86	\$40.90	\$42.05	\$44.14	\$47.92	\$49.23	\$49.50	
\$30.00	\$30.00	\$30.00	\$30.00	\$30.00	\$30.00	\$30.00	
\$7.86	\$10.90	\$12.05	\$14.14	\$17.92	\$19.23	\$19.50	
\$706,994	\$980,676	\$1,084,778	\$1,272,515	\$1,612,456	\$1,730,642	\$1,754,854	

[REDACTED]  
[REDACTED DATA ENDS]

[REDACTED]  
[REDACTED DATA ENDS]

Product B Avoided Emissions Based on new 7FA.05 CI			
Effluent	(Lb/MMBtu)	(Tons/MMBtu)	Annual Tons
NOx	0.03	0.000015	13.23
SOx	0.002	0.000001	0.882
CO	0.02	0.00001	8.82
CO2	120	0.06	52920
PM25	0.003	0.0000015	1.323

	2019	2020	2021	2022
NOx	13.23	13.23	13.23	13.23
SOx	0.882	0.882	0.882	0.882
CO	8.82	8.82	8.82	8.82
CO2	52920	52920	52920	52920
PM25	1.323	1.323	1.323	1.323

	2019	2020	2021	2022
NOx	\$2,686.26	\$2,741.73	\$2,798.46	\$2,855.98
SOx	\$4,946.78	\$5,048.91	\$5,153.38	\$5,259.31
CO	\$1.21	\$1.23	\$1.26	\$1.28
CO2	\$9.53	\$9.95	\$10.38	\$10.84
PM25	\$7,023.27	\$7,168.27	\$7,316.60	\$7,467.00

	2019	2020	2021	2022
NOx	\$7,988.02	\$8,152.94	\$8,321.64	\$8,492.70
SOx	\$12,322.84	\$12,577.26	\$12,837.51	\$13,101.40
CO	\$2.13	\$2.18	\$2.22	\$2.27
CO2	\$44.78	\$46.69	\$48.67	\$50.70
PM25	\$17,507.00	\$17,868.45	\$18,238.18	\$18,613.08

	2019	2020	2021	2022
NOx	\$35,539	\$36,273	\$37,024	\$37,785
SOx	\$4,363	\$4,453	\$4,545	\$4,639
CO	\$11	\$11	\$11	\$11
CO2	\$504,588	\$526,644	\$549,420	\$573,444
PM25	\$9,292	\$9,484	\$9,680	\$9,879

	2019	2020	2021	2022
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NOx	\$105,681	\$107,863	\$110,095	\$112,358
SOx	\$10,869	\$11,093	\$11,323	\$11,555
CO	\$19	\$19	\$20	\$20
CO2	\$2,369,566	\$2,470,862	\$2,575,446	\$2,682,942
PM25	\$23,162	\$23,640	\$24,129	\$24,625

	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	Ce
CO2-Reg-Low	\$0.00	\$0.00	\$0.00	\$0.00	
CO2-Reg-High	\$0.00	\$0.00	\$0.00	\$0.00	
CO2-Reg-Low	\$0	\$0	\$0	\$0	
CO2-Reg-High	\$0	\$0	\$0	\$0	

Annual Tons

2023	2024	2025	2026	2027
13.23	13.23	13.23	13.23	13.23
0.882	0.882	0.882	0.882	0.882
8.82	8.82	8.82	8.82	8.82
52920	52920	52920	52920	52920
1.323	1.323	1.323	1.323	1.323

High Externalities Cost (per unit)

2023	2024	2025	2026	2027
\$2,914.28	\$2,972.91	\$3,033.06	\$3,094.43	\$3,156.73
\$5,366.67	\$5,474.64	\$5,585.41	\$5,698.42	\$5,813.14
\$1.31	\$1.34	\$1.36	\$1.39	\$1.42
\$11.29	\$11.77	\$12.25	\$12.76	\$13.27
\$7,619.41	\$7,772.71	\$7,929.98	\$8,090.43	\$8,253.30

Low Externalities Cost (per unit)

2023	2024	2025	2026	2027
\$8,666.05	\$8,840.41	\$9,019.27	\$9,201.76	\$9,387.01
\$13,368.82	\$13,637.80	\$13,913.73	\$14,195.25	\$14,481.03
\$2.31	\$2.36	\$2.41	\$2.46	\$2.51
\$52.78	\$54.92	\$57.13	\$59.40	\$61.75
\$18,993.02	\$19,375.14	\$19,767.16	\$20,167.11	\$20,573.12

High Cost -- Values for Table

2023	2024	2025	2026	2027
\$38,556	\$39,332	\$40,127	\$40,939	\$41,764
\$4,733	\$4,829	\$4,926	\$5,026	\$5,127
\$12	\$12	\$12	\$12	\$13
\$597,520	\$622,793	\$648,269	\$675,178	\$702,171
\$10,080	\$10,283	\$10,491	\$10,704	\$10,919

Low Cost -- Values for Table

2023	2024	2025	2026	2027
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\$114,652	\$116,959	\$119,325	\$121,739	\$124,190
\$11,791	\$12,029	\$12,272	\$12,520	\$12,772
\$20	\$21	\$21	\$22	\$22
\$2,793,376	\$2,906,367	\$3,023,110	\$3,143,388	\$3,267,642
\$25,128	\$25,633	\$26,152	\$26,681	\$27,218

Carbon Regulation Costs -- Values for Table

<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>
\$0.00	\$0.00	\$5.00	\$5.10	\$5.20
\$0.00	\$0.00	\$25.00	\$25.50	\$26.01
\$0	\$0	\$264,600	\$269,892	\$275,290
\$0	\$0	\$1,323,000	\$1,349,460	\$1,376,449

**2028**

13.23

0.882

8.82

52920

1.323

**2028**

\$3,219.82

\$5,929.32

\$1.45

\$13.80

\$8,418.24

**2028**

\$9,574.61

\$14,770.43

\$2.56

\$64.14

\$20,984.27

**2028**

\$42,598

\$5,230

\$13

\$730,555

\$11,137

**Total**

\$389,936

\$47,871

\$117

\$6,130,583

\$101,949

**Figure**

**2028**

**Total**

Effluent	Displaced Emissions (Tons)
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\$126,672      \$1,159,535  
 \$13,028      \$119,252  
 \$23            \$206  
 \$3,394,451    \$28,627,151  
 \$27,762      \$254,130

NOx	132
SOx	9
CO	88
CO2	529,200
PM25	13
Lead (Pb)	0
Mercury (Mg)	0
<b>Total</b>	

**2028**            **Total**  
 \$5.31            n/a  
 \$26.53           n/a  
  
 \$280,796        \$1,090,577  
 \$1,403,978      \$5,452,887

**Figur**

Effluent	Displaced Emissions (Tons)
CO2	529,200

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Low Externality Scenario	High Externality Scenario
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\$389,936	\$1,159,535
\$47,871	\$119,252
\$117	\$206
\$6,130,583	\$28,627,151
\$101,949	\$254,130
\$0	\$0
\$0	\$0
<b>\$6,670,457</b>	<b>\$30,160,275</b>

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Low Regulation Penalty	High Regulation Penalty
\$1,090,577	\$5,452,887

228 C [TRADE SECRET DATA BEGINS] [REDACTED] [TRADE SECRET DATA ENDS]  
DR Product Cost (\$/MW-month) \$7,000

Customer [TRADE SECRET DATA BEGINS] [REDACTED] [TRADE SECRET DATA ENDS]

Ten Year Savings (150 MW)	\$4,647,882
Millions	4.65

A	B	C
<b>7FA.05 CT</b>		
Discount Rate		7.06%
Technology/Unit	7FA.05 CT	
<b>Base Capital: N</b>	<b>[TRADE SECRET DATA BEGINS]</b>	
7FA.05 CT Fixed Charge Rate	[REDACTED]	
Transmission Fixed Charge Rate	[REDACTED]	
NPV Start Year		2019
Levelized Years		20
Revenue Requirements Start Year		2019
Escalation Rate Capital		3.00%
Escalation Rate O&M		3.00%
Avg Annual Accredited Capacity (ICAP - MW)		228.00

7FA.05 CT Capital (\$000)	<b>[TRADE SECRET DATA BEGINS]</b>		2019S
Fixed O&M (\$000)	<b>[TRADE SECRET DATA BEGINS]</b>		2019S
			<b>[TRADE SECRET DATA BEGINS]</b>

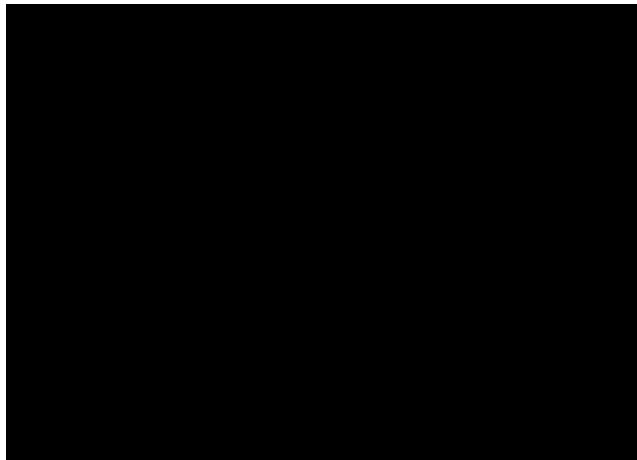
**Capital and O&M: 7FA.05 CT**

Revenue Requirements: (\$000)	20yr Levelized	20yr NPV (19-38)
Capital/Depreciation	[REDACTED]	
Fixed O&M	[REDACTED]	
<b>TOTAL</b>	[REDACTED]	
<b>228 CT Levelized Cost (\$/MW-month)</b>	[REDACTED]	
	<b>[TRADE SECRET DATA BEGINS]</b>	

**Annual Variable O&M Cost (\$000)**

Annual VOM Cost	Variable O&M (\$/MWh)
2019	[REDACTED]
2020	[REDACTED]
2021	[REDACTED]
2022	[REDACTED]
2023	[REDACTED]
2024	[REDACTED]

2025  
2026  
2027  
2028  
2029  
2030  
2031  
2032  
2033  
2034  
2035  
2036  
2037  
2038



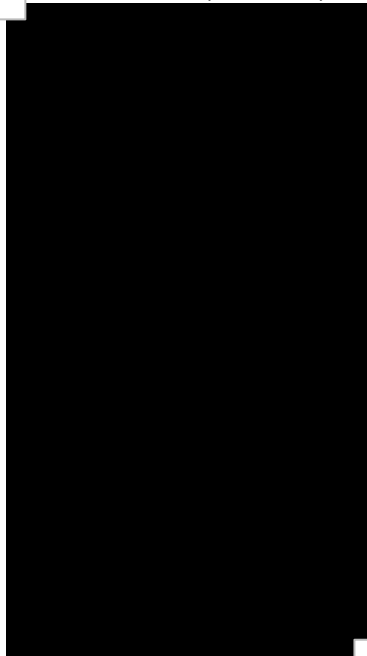
**Annual Fuel Cost (\$000)**

Annual Fuel Cost

**[TRADE SECRET DATA BEGINS**

Fuel Forecast (\$/MMBtu)

2019  
2020  
2021  
2022  
2023  
2024  
2025  
2026  
2027  
2028  
2029  
2030  
2031  
2032  
2033  
2034  
2035  
2036  
2037  
2038



**TRADE SECRET DATA**

D

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H

I

A ENDS]

Avg Annual Net Plant Heat Rate	
MBTU/MWh	
2019	9.800
2020	9.800
2021	9.800
2022	9.800
2023	9.800
2024	9.800
2025	9.800
2026	9.800
2027	9.800
2028	9.800

A ENDS]

A ENDS]

2019

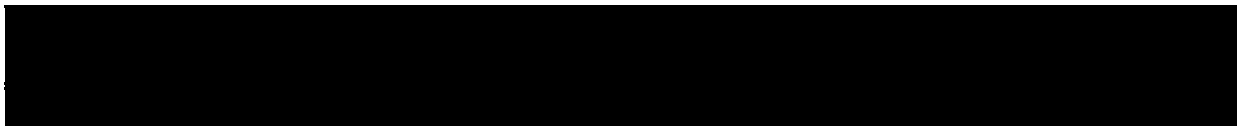
2020

2021

2022

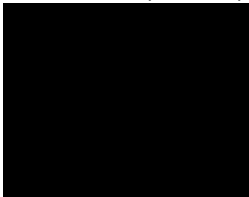
2023

2024



A ENDS]

Major Maintenance  
(\$/MWh)





**TRADE SECRET DATA ENDS]**

**A ENDS]**



J

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Q

Exhibit 3

2025

2026

2027

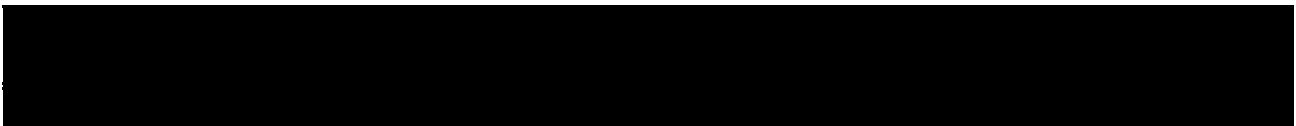
2028

2029

2030

2031

2032





R

S

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U

V

W

X

Y

Exhibit 3

2033

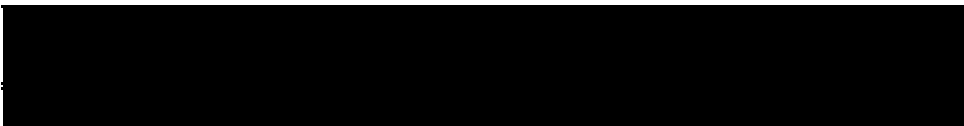
2034

2035

2036

2037

2038





**Z**

**AA**

**AB**

**AC**

**AD**

**AE**

**AF**

**AG**

**AH**

Exhibit 3



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**AI**

**AJ**

**AK**

**AL**

**AM**

**AN**

**AO**

**AP**

**AQ**

Exhibit 3





AR

AS

AT

AU

AV

AW

AX

AY

AZ

BA

Exhibit 3



**BB**