

APPENDIX 16

Air Quality Impact Tables 2005

Table 16.1
Summary of Maximum Modeled NO₂ Concentration Impacts (µg/m³) at PSD Class I and Sensitive PSD Class II Areas from Year-2005 Project Sources

Bridger Wilderness Class I		Fitzpatrick Wilderness Class I		Grand Teton National Park Class I		Gros Ventre Wilderness Class II		North Absoroka Wilderness Class I	
Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹
Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
0.221	8.22	0.015	8.02	0.006	8.01	0.019	8.02	0.001	8.00

Popo Agie Wilderness Class II		Teton Wilderness Class I		Washakie Wilderness Class I		Wind River Roadless Area Class II		Yellowstone National Park Class I	
Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹	Direct Modeled Impact	Total Concentration ¹
Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
0.046	8.05	0.003	8.00	0.002	8.00	0.033	8.03	0.001	8.00

¹ Total concentration includes direct modeled impact and background concentration for comparison to NAAQS/WAAQS which are 100 µg/m³ on an annual basis. Annual background NO₂ concentration value of 8 µg/m³ from Boulder monitor.

**Table 16.2
Summary of Maximum Modeled SO₂ Concentration (µg/m³) at PSD Class I and Sensitive PSD Class II Areas from Year-2005 Project Sources**

Bridger Wilderness Class I									Fitzpatrick Wilderness Class I									Grand Teton National Park Class I									Gros Ventre Wilderness Class II									North Absaroka Wilderness Class I								
Direct Modeled Impact			Total Concentration ¹						Direct Modeled Impact			Total Concentration ¹						Direct Modeled Impact			Total Concentration ¹						Direct Modeled Impact			Total Concentration ¹														
3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual												
0.80	0.23	0.02	132.8	43.2	9.02	0.19	0.06	0.003	132.2	43.1	9.00	0.08	0.017	0.001	132.1	43.0	9.00	0.17	0.04	0.002	132.2	43.0	9.00	0.03	0.01	0.0003	132.0	43.0	9.00															

Popo Agie Wilderness Class II									Teton Wilderness Class I									Washakie Wilderness Class I									Wind River Roadless Area Class II									Yellowstone National Park Class I								
Direct Modeled Impact			Total Concentration ¹						Direct Modeled Impact			Total Concentration ¹						Direct Modeled Impact			Total Concentration ¹						Direct Modeled Impact			Total Concentration ¹														
3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual												
0.18	0.04	0.01	132.2	43.0	9.01	0.05	0.01	0.001	132.0	43.0	9.00	0.05	0.01	0.001	132.0	43.0	9.00	0.19	0.05	0.01	132.2	43.0	9.01	0.05	0.01	0.0003	132.1	43.0	9.00															

¹ Total concentration includes direct modeled impact and background concentration for comparison with NAAQS/WAAQS which are 1,300 µg/m³ on a 3-hour basis, 365/260 µg/m³ on a 24-hour basis and 80/60 µg/m³ on an annual basis. Background SO₂ concentration values of 132 µg/m³, 43 µg/m³, and 9 µg/m³, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table 16.3
Summary of Maximum Modeled PM₁₀ Concentration Impacts (µg/m³) at PSD Class I and Sensitive PSD Class II Areas from Year-2005 Project Sources

Bridger Wilderness Class I				Fitzpatrick Wilderness Class I				Grand Teton National Park Class I				Gros Ventre Wilderness Class II				North Absaroka Wilderness Class I			
Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹	
24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
1.80	0.10	33.8	9.10	0.60	0.02	32.6	9.02	0.18	0.01	32.176	9.01	0.36	0.02	32.4	9.02	0.13	0.003	32.134	9.00

Popo Agie Wilderness Class II				Teton Wilderness Class I				Washakie Wilderness Class I				Wind River Roadless Area Class II				Yellowstone National Park Class I			
Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹	
24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
0.46	0.04	32.5	9.04	0.13	0.01	32.1	9.01	0.17	0.01	32.2	9.01	0.54	0.03	32.5	9.03	0.12	0.004	32.1	9.00

¹ Total concentration includes direct modeled impact and background concentration for comparison to NAAQS/WAAQS. The NAAQS and WAAQS are 150 µg/m³ on a 24-hour basis, and the WAAQS is 50 µg/m³ on an annual basis. The annual NAAQS for PM₁₀ was revoked by EPA effective December 18, 2006. Background PM₁₀ concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

Table 16.4
Summary of Maximum Modeled PM_{2.5} Concentration Impacts (µg/m³) at PSD Class I and Sensitive PSD Class II Areas from Year-2005 Project Sources

Bridger Wilderness Class I				Fitzpatrick Wilderness Class I				Grand Teton National Park Class I				Gros Ventre Wilderness Class II				North Absaroka Wilderness Class I			
Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹	
24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
0.72	0.10	15.7	6.10	0.19	0.02	15.2	6.02	0.11	0.01	15.1	6.01	0.15	0.02	15.2	6.02	0.05	0.003	15.0	6.00

Popo Agie Wilderness Class II				Teton Wilderness Class I				Washakie Wilderness Class I				Wind River Roadless Area Class II				Yellowstone National Park Class I			
Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹		Direct Modeled Impact		Total Concentration ¹	
24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
0.26	0.04	15.3	6.04	0.06	0.01	15.1	6.01	0.07	0.01	15.1	6.01	0.26	0.03	15.3	6.03	0.06	0.004	15.1	6.00

¹ Total concentration includes direct modeled impact and background concentration for comparison to NAAQS/WAAQS. The NAAQS and WAAQS on a 24-hour basis are 35 µg/m³ and 65 µg/m³, respectively. EPA has revised the 24-hour NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS. The NAAQS and WAAQS on an annual basis are 15 µg/m³. Background PM_{2.5} concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

Table 16.5
Summary of Maximum Modeled NO₂ Concentration Impacts (µg/m³)
Compared to PSD Increments from Year-2005 Project Sources

Bridger Wilderness Class I		Fitzpatrick Wilderness Class I		Grand Teton National Park Class I		Gros Ventre Wilderness Class II		North Absoroka Wilderness Class I	
Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment
Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
0.221	2.5	0.015	2.5	0.006	2.5	0.019	25.0	0.001	2.5

Popo Agie Wilderness Class II		Teton Wilderness Class I		Washakie Wilderness Class I		Wind River Roadless Area Class II		Yellowstone National Park Class I	
Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment	Direct Modeled Impact	PSD Increment
Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual	Annual
0.046	25.0	0.003	2.5	0.002	2.5	0.033	25.0	0.001	2.5

¹ All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption Analysis.

**Table 16.6
Summary of Maximum Modeled SO₂ Concentration (µg/m³) Compared to
PSD Increments from Year-2005 Project Sources¹**

Bridger Wilderness Class I						Fitzpatrick Wilderness Class I						Grand Teton National Park Class I						Gros Ventre Wilderness Class II						North Absaroka Wilderness Class I					
Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment		
3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual
0.80	0.23	0.02	25.0	5.0	2.0	0.19	0.06	0.003	25.0	5.0	2.0	0.08	0.017	0.001	25.0	5.0	2.0	0.17	0.04	0.002	512.0	91.0	20.0	0.03	0.01	0.0003	25.0	5.0	2.0

Popo Agie Wilderness Class II						Teton Wilderness Class I						Washakie Wilderness Class I						Wind River Roadless Area Class II						Yellowstone National Park Class I					
Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment			Direct Modeled Impact			PSD Increment		
3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual
0.18	0.04	0.01	512.0	91.0	20.0	0.05	0.01	0.001	25.0	5.0	2.0	0.05	0.01	0.001	25.0	5.0	2.0	0.19	0.05	0.01	512.0	91.0	20.0	0.05	0.01	0.0003	25.0	5.0	2.0

¹ All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption Analysis.

**Table 16.7
Summary of Maximum Modeled PM₁₀ Concentration Impacts (µg/m³) from
Year-2005 Project Sources Compared to PSD Increments¹**

Bridger Wilderness Class I				Fitzpatrick Wilderness Class I				Grand Teton National Park Class I				Gros Ventre Wilderness Class II				North Absaroka Wilderness Class I			
Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment	
24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
1.80	0.10	8.0	4.0	0.60	0.02	8.0	4.0	0.18	0.01	8.000	4.0	0.36	0.02	30.0	17.0	0.13	0.003	8.000	4.0

Popo Agie Wilderness Class II				Teton Wilderness Class I				Washakie Wilderness Class I				Wind River Roadless Area Class II				Yellowstone National Park Class I			
Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment		Direct Modeled Impact		PSD Increment	
24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
0.46	0.04	30.0	17.0	0.13	0.01	8.0	4.0	0.17	0.01	8.0	4.0	0.54	0.03	30.0	17.0	0.12	0.004	8.0	4.0

¹ All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption Analysis.

**Table 16.8
Summary of Maximum Modeled In-field Pollutant Concentrations ($\mu\text{g}/\text{m}^3$) from Year-2005 Project Sources**

NO ₂				SO ₂											
Direct Modeled Impact ¹	PSD Class II Increment ²	Total Concentration ³	NAAQS/WAAQS	Direct Modeled Impact ¹			PSD Class II Increment ²			Total Concentration ³			NAAQS/WAAQS		
Annual	Annual	Annual	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual
31.6	25.0	39.6	100	76.1	14.9	2.3	512.0	91.0	20.0	208.1	57.9	11.3	1,300	365/260	80/60

PM ₁₀								PM _{2.5}					
Direct Modeled Impact ¹		PSD Class II Increment ²		Total Concentration ³		NAAQS/ WAAQS		Direct Modeled Impact		Total Concentration ³		NAAQS/ WAAQS	
24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
76.3	20.9	30.0	17.0	108.3	29.9	150	50 ⁴	15.0	5.4	30.0	11.4	35 ⁵ (65) ⁶	15

¹ Background concentrations are not added to modeled concentrations for comparison to the PSD increment.
² All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption Analysis.
³ Total concentration includes direct modeled impact and background concentration.
 Annual background NO₂ concentration value of 8 $\mu\text{g}/\text{m}^3$ from Boulder monitor.
 Background SO₂ concentration values of 132 $\mu\text{g}/\text{m}^3$, 43 $\mu\text{g}/\text{m}^3$, and 9 $\mu\text{g}/\text{m}^3$, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.
 Background PM₁₀ concentration values of 32 $\mu\text{g}/\text{m}^3$ and 9 $\mu\text{g}/\text{m}^3$, from Boulder used for 24-hour and annual averaging periods, respectively.
 Background PM_{2.5} concentration values of 15 $\mu\text{g}/\text{m}^3$ and 6 $\mu\text{g}/\text{m}^3$, from Pinedale used for 24-hour and annual averaging periods, respectively.
⁴ Annual NAAQS for PM₁₀ was revoked by EPA effective December 18, 2006.
⁵ Revised NAAQS effective December 18, 2006.
⁶ EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

Table 16.9
Summary of Maximum Modeled Visibility Impacts from Year-2005 at PSD Class I and Sensitive PSD Class II Areas
from Year-2005 Project Sources Using FLAG Background Data - (MVISBK=6)

Bridger Wilderness Class I		Fitzpatrick Wilderness Class I		Grand Teton National Park Class I		Gros Ventre Wilderness Class II		North Absaroka Wilderness Class I	
Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)
6.1	45	3.9	5	1.1	1	2.8	2	0.5	0

Popo Agie Wilderness Class II		Teton Wilderness Class I		Washakie Wilderness Class I		Wind River Roadless Area Class II		Yellowstone National Park Class I	
Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)	Maximum Visibility Impact (Δ dv)	Number of Days > 1.0 Δ dv (days)
2.3	6	0.8	0	0.9	0	2.9	6	0.5	0

Note: Δ dv = change in deciview.

Table 16.10
Summary of Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations
from Year-2005 Project Sources Using Boulder Background Data

Boulder		Cora		Pinedale	
Maximum Visibility Impact (Δdv) ¹	Number of Days > 1.0 Δdv ¹ (days)	Maximum Visibility Impact (Δdv) ¹	Number of Days > 1.0 Δdv ¹ (days)	Maximum Visibility Impact (Δdv) ¹	Number of Days > 1.0 Δdv ¹ (days)
12.2	108	8.5	36	10.3	55

¹ Δdv = change in deciview.

Table 16.11
Summary of Maximum Modeled Total Nitrogen (N) Deposition Impacts (kg/ha-yr) at
PSD Class I and Sensitive PSD Class II Areas from Year-2005 Project Sources¹

Bridger Wilderness Class I		Fitzpatrick Wilderness Class I		Grand Teton National Park Class I		Gros Ventre Wilderness Class II		North Absaroka Wilderness Class I	
Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³	Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³
0.058	1.478	0.007	1.427	0.004	1.294	0.008	1.428	0.003	1.293

Popo Agie Wilderness Class II		Teton Wilderness Class I		Washakie Wilderness Class I		Wind River Roadless Area Class II		Yellowstone National Park Class I	
Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³	Modeled Impact	Total Impact ³	Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³
0.020	1.440	0.003	1.293	0.003	1.293	0.012	1.432	0.002	1.292

¹ Nitrogen deposition analysis level of concern for total impacts - 3.00 kg/ha-yr.

² Includes N deposition value of 1.42 kg/ha-yr measured at the CASTNET/NADP site near Pinedale for the year 2004.

³ Includes N deposition value of 1.29 kg/ha-yr measured at the CASTNET/NADP site at Yellowstone National Park for the year 2005.

Table 16.12
Summary of Maximum Modeled Total Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I
and Sensitive PSD Class II Areas from Year-2005 Project Sources¹

Bridger Wilderness Class I		Fitzpatrick Wilderness Class I		Grand Teton National Park Class I		Gros Ventre Wilderness Class II		North Absaroka Wilderness Class I	
Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³	Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³
0.0098	0.750	0.0015	0.741	0.0006	0.681	0.0013	0.741	0.0004	0.680

Popo Agie Wilderness Class II		Teton Wilderness Class I		Washakie Wilderness Class I		Wind River Roadless Area Class II		Yellowstone National Park Class I	
Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³	Modeled Impact	Total Impact ³	Modeled Impact	Total Impact ²	Modeled Impact	Total Impact ³
0.0042	0.744	0.0005	0.680	0.0006	0.681	0.0026	0.743	0.0004	0.680

¹ Sulfur deposition analysis level of concern for total impacts = 5.0 kg/ha-y.

² Includes S deposition value of 0.74 kg/ha-yr measured at the CASTNET/NADP site near Pinedale for the year 2004.

³ Includes S deposition value of 0.68 kg/ha-yr measured at the CASTNET/NADP site at Yellowstone National Park for the year 2005.

Table 16.13
Summary of Maximum Modeled Change in ANC ($\mu\text{eq/L}$) at Acid-Sensitive Lakes from Year-2005 Project Sources

Alternative	Black Joe Lake		Deep Lake		Hobbs Lake		Lazy Boy Lake		Lower Saddlebag		Ross Lake		Upper Frozen	
	Bridger Wilderness Class I		Bridger Wilderness Class I		Bridger Wilderness Class I		Bridger Wilderness Class I		Popo Agie Wilderness Class II		Fitzpatrick Wilderness Class I		Bridger Wilderness Class I	
	ANC Change ($\mu\text{eq/L}$)	ANC Change (%)	ANC Change ($\mu\text{eq/L}$)	ANC Change (%)	ANC Change ($\mu\text{eq/L}$)	ANC Change (%)	ANC Change ($\mu\text{eq/L}$)	ANC Change (%)	ANC Change ($\mu\text{eq/L}$)	ANC Change (%)	ANC Change ($\mu\text{eq/L}$)	ANC Change (%)	ANC Change ($\mu\text{eq/L}$)	ANC Change (%)
Level of Acceptable Change($\mu\text{eq/L}$)	6.71	10%	5.97	10%	6.99	10%	1.00	--	5.52	10%	5.37	10%	1.00	--
Background	67.1	--	59.7	--	69.9	--	10.8	--	55.2	--	53.7	--	6.0	--
Predicted change in ANC	0.18	0.27%	0.20	0.34%	0.10	0.15%	0.06	--	0.19	0.35%	0.05	0.10%	0.22	--

¹ USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 $\mu\text{eq/L}$,
₁ $\mu\text{eq/L}$ for lakes with ANC values less than or equal to 25 $\mu\text{eq/L}$.