

**Appendix A: Emission Calculations  
Criteria Pollutant Emissions from  
the Coal Fired Boiler U1**

**Company Name: Navajo Generating Station  
Address: 5 miles east of Page, off U.S. Highway 98, Page, AZ 86040  
Permit No.: NN-ROP-05-06**

Max. Heat Input Capacity  
MMBtu/hr

7,725

Ash Content (A)

13.5 % (provided by the source)

Emission Factor	Pollutant					
	PM <sup>a</sup>	PM10 <sup>b</sup>	SO <sub>2</sub> <sup>c</sup>	NOx <sup>d</sup>	VOC <sup>e</sup>	CO <sup>d</sup>
	0.06 (lbs/MMBtu)	0.3305 (2.3A*0.01+0.02) (lbs/ton)	0.10 (lbs/MMBtu)	0.24 (lbs/MMBtu)	0.06 (lbs/ton)	0.42 (lbs/MMBtu)
<b>Potential to Emit in (tons/yr)</b>	<b>2,030</b>	<b>519</b>	<b>3,384</b>	<b>8,121</b>	<b>94.2</b>	<b>14,211</b>

<sup>a</sup> PM emission factor is the emission limit in 40 CFR 49.20.

<sup>b</sup> PM10 emission factor is from AP-42, Tables 1.1-4 and 1.1-5 (09/98). Assume the ESP control efficiency is 99%. PM10 emission factor is filterable PM10 emission factor and condensable PM emission factor combined.

<sup>c</sup> The SO<sub>2</sub> emission factor is based on the emission limit in 40 CFR 52.145(d) and the

<sup>d</sup>NOx and CO emission factors are based on the emission limit in PSD permit AZ 08-01.

<sup>e</sup> VOC emission factors are from AP-42, Tables 1.1-19 (09/98).

The heating value of the coal used at this plant is 21.562 MMBtu/ton, provided by the Permittee.

### Methodology

PTE of PM10, VOC, and CO (tons/yr) = Max. Heat Input (MMBtu/hr) / 21.562 MMBtu/ton x Emission Factor (lbs/ton) x 8760 hrs/yr x 1 ton/2,000 lbs

PTE of PM, SO<sub>2</sub>, and NOx (tons/yr) = Max. Heat Input (MMBtu/hr) x Emission Factor (lbs/MMBtu) x 8760 hr/yr x 1 ton/2,000 lbs

**Appendix A: Emission Calculations  
Criteria Pollutant Emissions from  
the Coal Fired Boiler U2**

**Company Name: Navajo Generating Station  
Address: 5 miles east of Page, off U.S. Highway 98, Page, AZ 86040  
Permit No.: NN-ROP-05-06**

Max. Heat Input Capacity  
MMBtu/hr

7,725

Ash Content (A)

13.5 % (provided by the source)

	Pollutant					
Emission Factor	PM <sup>a</sup> 0.06 (lbs/MMBtu)	PM10 <sup>b</sup> 0.3305 (2.3A*0.01+0.02) (lbs/ton)	SO <sub>2</sub> <sup>c</sup> 0.10 (lbs/MMBtu)	NO <sub>x</sub> <sup>d</sup> 0.24 (lbs/MMBtu)	VOC <sup>e</sup> 0.06 (lbs/ton)	CO <sup>d</sup> 0.42 (lbs/MMBtu)
<b>Potential to Emit in (tons/yr)</b>	<b>2,030</b>	<b>519</b>	<b>3,384</b>	<b>8,121</b>	<b>94.2</b>	<b>14,211</b>

<sup>a</sup> PM emission factor is the emission limit in 40 CFR 49.20.

<sup>b</sup> PM10 emission factor is from AP-42, Tables 1.1-4 and 1.1-5 (09/98). Assume the ESP control efficiency is 99%. PM10 emission factor is filterable PM10 emission factor and condensable PM emission factor combined.

<sup>c</sup> The SO<sub>2</sub> emission factor is based on the emission limit in 40 CFR 52.145(d) and the

<sup>d</sup>NO<sub>x</sub> and CO emission factor is based on the emission limit in the PSD permit.

<sup>e</sup> VOC emission factors are from AP-42, Tables 1.1-19 (09/98).

The heating value of the coal used at this plant is 21.562 MMBtu/ton, provided by the Permittee.

### Methodology

PTE of PM10, VOC, and CO (tons/yr) = Max. Heat Input (MMBtu/hr) / 21.562 MMBtu/ton x Emission Factor (lbs/ton) x 8760 hrs/yr x 1 ton/2,000 lbs

PTE of PM, SO<sub>2</sub>, and NO<sub>x</sub> (tons/yr) = Max. Heat Input (MMBtu/hr) x Emission Factor (lbs/MMBtu) x 8760 hr/yr x 1 ton/2,000 lbs

**Appendix A: Emission Calculations  
Criteria Pollutant Emissions from  
the Coal Fired Boiler U3**

**Company Name: Navajo Generating Station  
Address: 5 miles east of Page, off U.S. Highway 98, Page, AZ 86040  
Permit No.: NN-ROP-05-06  
Date: August 18, 2010**

Max. Heat Input Capacity  
MMBtu/hr

7,725

Ash Content (A)

13.5 % (provided by the source)

Emission Factor	Pollutant					
	PM <sup>a</sup>	PM10 <sup>b</sup>	SO <sub>2</sub> <sup>c</sup>	NOx <sup>d</sup>	VOC <sup>e</sup>	CO <sup>d</sup>
	0.06 (lbs/MMBtu)	0.3305 (2.3A*0.01+0.02) (lbs/ton)	0.10 (lbs/MMBtu)	0.24 (lbs/MMBtu)	0.06 (lbs/ton)	0.42 (lbs/ton)
<b>Potential to Emit in (tons/yr)</b>	<b>2,030</b>	<b>519</b>	<b>3,384</b>	<b>8,121</b>	<b>94.2</b>	<b>14,211</b>

<sup>a</sup> PM emission factor is the emission limit in 40 CFR 49.20.

<sup>b</sup> PM10 emission factor is from AP-42, Tables 1.1-4 and 1.1-5 (09/98). Assume the ESP control efficiency is 99%. PM10 emission factor is filterable PM10 emission factor and condensable PM emission factor combined.

<sup>c</sup> The SO<sub>2</sub> emission factor is based on the emission limit in 40 CFR 52.145(d) and the

<sup>d</sup>NOx and CO emission factor is based on the emission limit in the PSD permit.

<sup>e</sup> VOC emission factors are from AP-42, Tables 1.1-19 (09/98).

The heating value of the coal used at this plant is 21.562 MMBtu/ton, provided by the Permittee.

### Methodology

PTE of PM10, VOC, and CO (tons/yr) = Max. Heat Input (MMBtu/hr) / 21.562 MMBtu/ton x Emission Factor (lbs/ton) x 8760 hrs/yr x 1 ton/2,000 lbs

PTE of PM, SO<sub>2</sub>, and NOx (tons/yr) = Max. Heat Input (MMBtu/hr) x Emission Factor (lbs/MMBtu) x 8760 hr/yr x 1 ton/2,000 lbs

**Appendix A: Emission Calculations  
PTE Summary**

**Company Name: Navajo Generating Station  
Address: 5 miles east of Page, off U.S. Highway 98, Page, AZ 86040  
Permit No.: NN-ROP-05-06**

**Limited Potential To Emit after Control**

<b>Emission Units</b>	<b>PM</b>	<b>PM10</b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>	<b>Total HAPs</b>
Boiler U1	2,030	519	3,384	8,121	94.2	14,211	125
Boiler U2	2,030	519	3,384	8,121	94.2	14,211	125
Boiler U3	2,030	519	3,384	8,121	94.2	14,211	125
Auxiliary Boilers	60.7	60.7	1,444	442	3.68	92.0	11.1
Coal Handling Operations	10.66	6.44	-	-	-	-	-
Coal Piles (Fugitive)	5.43	2.57	-	-	-	-	-
Limestone Handling Operations	4.61	2.98	-	-	-	-	-
Limestone Piles (Fugitive)	4.60	2.17	-	-	-	-	-
Fly Ash Handling Operations	29.2	29.2	-	-	-	-	0.01
Soda Ash/Lime Handling Operations	0.26	0.26	-	-	-	-	-
Cooling Towers	19.2	19.2	-	-	-	-	-
Unpaved Roads (Fugitive)	591	153	-	-	-	-	-
Emergency Generators	0.74	0.74	0.69	10.5	0.83	2.26	Negligible
Other Insignificant Activities*	5.00	5.00	-	5.00	5.00	-	Negligible
<b>Total PTE (tons/yr)</b>	<b>6,822</b>	<b>1,838</b>	<b>11,595</b>	<b>24,819</b>	<b>292</b>	<b>42,727</b>	<b>387</b>

\*Note: This is an estimate on the PM/PM10 emissions from the welding and blasting operations, and VOC/HAP emissions from the parts cleaning, surface coating operations, and the storage tanks.