



Massachusetts Department of Environmental Protection

Bureau of Air and Waste – Air Quality

BAW AQ Selective Catalytic Reduction

Submit with Form CPA-FUEL and/or CPA-PROCESS whenever construction, substantial reconstruction or alteration of a Selection Catalytic Reduction system is proposed unless exempt per 310 CMR 7.02(2)(b).

Facility ID (if known)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Inlet Operating Conditions

1. Complete the table below with information on inlet gas flow(s).

Table 1a			
Emission Unit No(s). Being Controlled	Average Inlet Gas Flow (Actual Cubic Feet Per Minute)	Inlet Temperature (Degrees Fahrenheit (°F))	Moisture Content in the Inlet (Pounds Per Minute)
Totals:			

2. Which metals/elements are present in gas stream?
- ☐ Potassium ☐ Arsenic ☐ Lead
☐ Zinc ☐ Sodium ☐ Phosphorus
3. Are there any other catalyst binding agents present in the gas stream?
- ☐ Yes – Describe Below ☐ No

4. Complete the table below to provide the maximum oxides of nitrogen (NO_x) emissions:

Table 2		
Emission Unit No(s). Being Controlled	Inlet NO _x (Pounds Per Hour)	Inlet NO _x (Parts Per Million by Volume, Dry Basis)

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B. Specifications

1. Manufacturer of Selective Catalytic Reduction (SCR) system: _____
Company
2. Model Number (or Equivalent): _____
Number
3. Location of SCR unit relative to other pieces of equipment: ☐ High Dust ☐ Low Dust ☐ Tail End
4. Information about the catalyst used:
 - a. Description of catalyst: _____
Description
 - b. Operating temperature range of catalyst: from _____ to _____
Degrees Fahrenheit (°F) Degrees Fahrenheit (°F)
 - c. Pressure drop across the catalyst: _____
Inches of Water
- 5a. Number of catalyst layers the system can accommodate: _____
Number
- 5b. Number of catalyst layers that will be installed: _____
Number
6. Does the SCR system employ a guard bed for catalyst protection? ☐ Yes ☐ No*
*If No, explain:

7. Expected catalyst life: _____
Years
8. Operating hours per layer of catalyst: _____
Hours
9. Can the catalyst be reactivated? ☐ Yes * ☐ No
*If Yes, describe how:

10. Catalyst cleaning method: ☐ Compressed Air Soot Blower ☐ Steam Soot Blower
☐ Sonic Horns ☐ Other – Describe: _____
11. Describe SCR system dust management technologies and strategies being used, if any (e.g. ash screens):



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B. Specifications (continued)

12. Are you proposing a by-pass stack? ☐ Yes * ☐ No

*If Yes, describe:

C. Description of Reducing Agent

1. Type and form of reducing agent proposed: ☐ Gaseous ☐ Liquid ☐ Anhydrous Ammonia
☐ Aqueous Ammonia ☐ Urea
☐ Other – Describe: _____

2. If liquid, provide weight percent in solution: _____

Weight Percent

3. Method of reducing agent injection: ☐ Direct Injection ☐ Injection Grid

4. Describe in detail how the concentration and usage rate of the reducing agent were determined. Continue on a separate attachment, if necessary.

5. Describe the process controls for proper mixing of the reducing agent in the gas stream. Continue on a separate attachment, if necessary.

6. Describe storage of the reagent, including details about any storage containment (e.g. dimension of berms, evaporative mitigation). Continue on a separate attachment, if necessary.

7. Is the reagent subject to 42 U.S.C. 7401, Section 112(r)? ☐ Yes * ☐ No

*If Yes, attach a copy of the Risk Management Plan to this form.

8. You MUST attach to this form a copy of an analysis of possible impacts to off-property locations from a catastrophic release of the reducing agent, in comparison with American Industrial Hygiene Association Emergency Response Planning Guidelines.



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D. Emissions Data

1. Complete the table below to provide maximum oxides of nitrogen (NO_x) and ammonia (NH₃) slip concentrations and emission rates:

Table 3		
Air Contaminant	Outlet (Pounds Per Hour)	Outlet ¹ (Parts Per Million By Volume, Dry Basis)
NO _x		
NH ₃		

¹Boilers at 3% oxygen; combustion turbines at 15% oxygen; engines at 15% oxygen.

2. Explain how the above NO_x and NH₃ emissions data were obtained. Attach appropriate calculations and documentation.

E. Drawing of Selective Catalytic Reduction System

You must attach to this form a schematic drawing of the proposed Selective Catalytic Reduction system. At a minimum, it must show the location(s) of the catalyst bed(s), bypass damper(s) if applicable, bypass stack if applicable, and normal stack. Sampling ports for emissions testing must also be shown.

F. Monitoring, Record Keeping & Failure Notification

1. Provide the manufacturer, make and model number of the proposed continuous emissions and opacity monitoring systems:

2. Identify the air contaminants that will be continuously monitored and recorded (e.g. NO_x, NH₃, opacity)

3. Describe any proposed process monitors (e.g. ammonia injection, fuel combustion) and frequency of data recording:



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F. Monitoring, Record Keeping & Failure Notification (continued)

4. Are there any alarms associated with the monitoring equipment? ☐ Yes – Complete Table 4 ☐ No – Explain Below

Table 4			
Operating Parameter Monitored	Describe Alarm Trigger	Monitoring Device or Alarm Type	Does the Alarm Initiate an Automated Response?
		<input type="checkbox"/> Visual <input type="checkbox"/> Auditory <input type="checkbox"/> Automatic (Remote Monitoring) <input type="checkbox"/> Other – Describe:	<input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe:
		<input type="checkbox"/> Visual <input type="checkbox"/> Auditory <input type="checkbox"/> Automatic (Remote Monitoring) <input type="checkbox"/> Other – Describe:	<input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe:
		<input type="checkbox"/> Visual <input type="checkbox"/> Auditory <input type="checkbox"/> Automatic (Remote Monitoring) <input type="checkbox"/> Other – Describe:	<input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe:

5. Describe the operating conditions that are monitored to determine the reducing agent injection rate:

6. How often will the catalyst be tested and by what test method (e.g. core sample)?

7. List and explain all of the operating and safety controls associated with the SCR system. Continue on a separate attachment, if necessary.

8. List the SCR system emergency procedures to be used during system upsets. Continue on a separate attachment, if necessary.



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F. Monitoring, Record Keeping & Failure Notification (continued)

9. Explain the typical fluctuations in SCR system operation, such as changes in effluent temperatures, flow rates, pollutant concentrations, etc., which may affect operation of the unit. Also explain the means by which control efficiency will be maintained throughout these fluctuations. Continue on a separate attachment, if necessary.

10. Describe the record keeping procedures to be used in identifying the cause, duration and resolution of each system failure/emission(s) exceedance. Continue on a separate attachment, if necessary.

11. How will the SCR system be designed so as to allow for emissions testing using MassDEP-sanctioned test methods?

G. Standard Operating & Maintenance Procedures

Attach to this form the standard operating and maintenance procedures for the proposed Selective Catalytic Reduction system, as well as a list of the spare parts inventory that you will maintain on site, as recommended by the equipment vendor.