



BWP AQ 22

Instructions and Supporting Materials

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Introduction

MassDEP *Permit Applications*, as well as *Instructions & Support Materials*, are available for download from the MassDEP Web site at mass.gov/dep in two file formats: Microsoft Word™ and Adobe Acrobat PDF™. Either format allows documents to be printed.

Instructions & Support Materials files in Microsoft Word™ format contain a series of documents that provide guidance on how to prepare a permit application. Although we recommend that you print out the entire package, you may choose to print specific documents by selecting the appropriate page numbers for printing.

Permit Applications in Microsoft Word™ format must be downloaded separately. Users with Microsoft Word™ 97 or later may complete these forms electronically.

Permitting packages in Adobe Acrobat PDF™ format combine *Permit Applications* and *Instructions & Support Materials* in a single document. Adobe Acrobat PDF™ files may only be viewed and printed without alteration. *Permit Applications* in this format may not be completed electronically.



BWP AQ 22

Permit Fact Sheet

1. What is the purpose of this permit?

The ECP is the instrument used by facilities to demonstrate to MassDEP and all interested parties including the general public, how they are going to comply with specific emission standards in a regulation and to allow public comment. This process enhances environmental protection by allowing for comments from various interests, and incorporating these comments as well as the regulatory requirements into one document. The application material submitted to the MassDEP and the plan approval letter become the approved plan.

2. Who must apply?

An ECP is required for municipal waste combustor units subject to 310 CMR 7.08(2). These units are units which combust greater than 250 tons per day of municipal solid waste.

3. What other requirements should be considered when applying for this permit?

None

4. What are the application fees?

The application fee for BWP AQ22 is \$7,180.

5. What is the Primary Permit Location? What is the Reserve Copy Location?

Primary Permit Location:

BWP AQ22 permit applications should be submitted in duplicate to the MassDEP Regional Office responsible for the community in which the facility is located.

Department of Environmental Protection
BWP Permitting Program, Air Quality Section
_____ * Regional Office

*Find your region: <http://mass.gov/dep/about/region/findyour.htm>

If approved, MassDEP stamps one copy and returns it to you for your records. In this manner, MassDEP and the applicant have identical copies of the approved submittal. Supplemental forms may be required when competing the ECP. Supplemental forms BWP AQ SFC-1, BWP AQ SFC-3 and BWP AQ SFC-6 are included in this application kit.

Reserve Copy Locations:

There are no Reserve Copy Locations for these permits.



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Permit Fact Sheet

6. What are the timelines?

BWP AQ22 applications are subject to the timelines at: www.mass.gov/dep/service/online/fees.htm

7. What is the annual compliance fee?

The amount of the annual compliance assurance fee depends upon the facility's potential emissions. Please consult Table 4.03 (Air Quality Section) of 310 CMR 4.03 for more information. If you fail to pay the bill for your annual compliance assurance fee, your permit to operate could be suspended or revoked.

8. How long is this permit in effect?

The permit is in effect until the facility approved in this plan is substantially reconstructed or altered, at which time a new approval may be required.

9. How can I avoid the most common mistakes made in applying for this permit?

- a. Answer all questions on the application form and indicate "N/A" (not applicable) where appropriate.
- b. Be sure to have a legally responsible company official sign the application.
- c. Submit two copies of the application to the regional office (one of which must contain an original signature).
- d. Submit the BWP AQ22 fee of \$6,000 and a copy of the MassDEP Transmittal Form (<http://mass.gov/dep/service/online/trasmfrm.shtml>) to:

Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

10. What are the regulations that apply to this permit? Where can I get copies?

These regulations include, but not limited to:

- a. Air Quality Control Regulations, 310 CMR 6.00 - 8.00.
- b. Solid Waste regulations 310 CMR 19.00.
- c. Timely Action and Fee Provisions, 310 CMR 4.00.
- d. Administrative Penalty Regulations, 310 CMR 5.00.

These may be purchased at:

State House Bookstore
Room 116
Boston, MA 02133

State House West Bookstore
436 Dwight Street
Springfield, MA 01103



BWP AQ 22

Instructions for Completing the Permit Application

Emission Control Plan For Owners or Operators Subject To The Municipal Waste Combustor Regulation Under 310 CMR 7.08(2) Municipal Waste Combustors.

SECTION A

1. Facility Information - Give the complete name and address of the facility.
2. Facility Contact Person - Indicate the person responsible for the day to day operations of the facility. Plant manager for example.
3. Facility Owner - This can be a person or a corporation.

SECTION B

Facility Description - Include a description of each stage of the operation for the facility along with a schematic indicating all stages of the process.

SECTION C - This section shall be completed for each unit.

1. Unit Designation - Indicate the designation of each unit (e.g. Unit 1 or Unit A)
2. Manufacturer - List the manufacturer of the unit.
3. Model Number - List the model number of the unit.
4. Maximum Continuous Rated Design Capacity - Indicate in parts a and b the heat input and steam load as applicable.
5. Waste Type - Indicate refuse combustion type (e.g. Mass Burn, RDF, etc.)
6. Heat Recovery - In a - d indicate the method of measuring the load (steam flow meter or feedwater meter), the manufacturer, model number and maximum rating in lbs/hr.
7. Auxiliary Burners - In a - d indicate the manufacturer, model number, type of fuel used and the maximum rating in Btu/hr of any auxiliary burners used.
8. Date of installation - Indicate the date of installation of the unit.

SECTION D

In the Table shown in the ECP application, list all plan approvals the facility is subject to (e.g. 310 CMR 7.02, PSD, etc.) along with the specific emission limits of pollutants which will be regulated under 310 CMR 7.08(2). Convert all existing emission limits to the same units as are outlined in 310 CMR 7.08(2) for the particular pollutant involved. If different permits apply to different units, indicate which permits apply to which units.

SECTION E - Emissions Control For Particulate Matter, Opacity Hydrogen Chloride, Sulfur Dioxides, Cadmium and Lead.

1. Existing Controls - Indicate the types of air pollution control equipment currently being used (e.g. electrostatic precipitator, fabric filter, dry sorbent injection, spray dryer, etc.).



BWP AQ 22

Instructions for Completing the Permit Application

2. Proposed Controls - Indicate the type(s) of air pollution control equipment being proposed.

Complete the form(s) below if the equipment being proposed is one of the following:

1. Fabric Filter - Complete BWP AQ SFC-1
2. Electrostatic Precipitator - Complete BWP AQ SFC-6
3. Spray Dryer - Complete BWP AQ SFC-3
4. Other - The Department shall be notified prior to the submission of the ECP if control equipment being proposed for said pollutants other than that listed in 1,2 and 3, above is being considered.

Indicate if the existing controls will be removed.

3. Emissions - List emissions limits proposed to satisfy the requirements of 310 CMR 7.08(2). These limits may be either the limits in the regulation or more stringent limits.
4. Include standard operating and maintenance procedures for the proposed air pollution control equipment. If they are not available at the time the ECP application is completed, submit them prior to operation.

SECTION F - Emissions Control for Mercury

Attach a separate sheet describing the emission control equipment being proposed to control mercury if it is not an activated carbon or equivalent sorbent injection system.

For activated carbon or equivalent sorbent injection systems:

1. Attach a separate sheet describing in detail the process. Include a process schematic.
2. Besides the listed information in the ECP, attach a separate sheet describing the process parameters which will be used to control the mercury concentration.
3. - 6. See ECP Application.
7. Include standard operating and maintenance procedures for the proposed carbon injection system. If they are not available at the time the ECP application is completed, submit them prior to operation.

SECTION G - Emission Controls for Nitrogen Oxides

1. Attach a separate sheet describing the emission control equipment being proposed to control Nitrogen Oxides. Attach a separate sheet describing in detail the process, including a process schematic.
2. Attach a separate sheet describing the process parameters which will be used to control the nitrogen oxides concentration.
3. Attach a separate sheet describing the materials that will be used to control nitrogen oxide emissions.
4. - 5. See ECP application.
6. Include standard operating and maintenance procedures for the proposed nitrogen oxide emissions controls. If they are not available at the time the ECP application is completed, submit them prior to operation.



Massachusetts Department of Environmental Protection
Bureau of Waste Prevention - Permitting - Air Quality Section

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Instructions for Completing the Permit Application

SECTION H - Emission Controls for Fugitive Ash

1. Attach a separate sheet describing the existing emission control equipment being used to control fugitive ash from ash conveying system including transfer points.
2. Attach a separate sheet describing in detail the process, including a process schematic of any proposed modifications to existing controls or any new controls.
3. Include standard operating and maintenance procedures for the proposed ash conveying systems. If they are not available at the time the ECP application is completed, submit them prior to operation.

SECTION I - Retrofit Schedule

Indicate specific dates or no later than dates for 1. - 4. in Section I of the ECP.

SECTION J - Certification

The seal and signature of a registered professional engineer.

SECTION K - Demonstration of Compliance

The signature of a responsible official as defined in 310 CMR 7.00, definitions.

**Most MassDEP permit application packages
are available from MassDEP's web site at**

<http://mass.gov/dep>

<p>This information is available in alternative format upon request to MassDEP's ADA Coordinator, BAS/HR, 4th Flr. One Winter Street, Boston, MA 02108</p>
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Massachusetts Department of Environmental Protection
Bureau of Waste Prevention - Permitting - Air Quality Section

BWP AQ 22 Municipal Waste Combustor - Emission Control Plan (ECP) **Application Completeness Checklist**

- The MassDEP Transmittal Form (<http://mass.gov/dep/service/online/trasmfrm.shtml>) has been completed.
- The BWP AQ22 Permit Application Form has been completed in accordance with "Instructions for Completing the Permit Application." All questions have been answered or N/A inserted where appropriate.
- A signature of the legally responsible official has been included even if an agent has been hired to complete the application.

To submit a BWP AQ22 application package:

- Ensure all Checklist items have been completed.
- Two copies of the application package have been prepared and submitted with the DEP Transmittal Form to the MassDEP Regional Office responsible for the community in which the facility is located.

Department of Environmental Protection
BWP Permitting Program, Air Quality Section
_____ * **Regional Office**

*Find your region: <http://mass.gov/dep/about/region/findyour.htm>

- The BWP AQ22 fee of \$7,180 in the form of a check or money order payable to the Commonwealth of Massachusetts and a copy of the MassDEP Transmittal Form (<http://mass.gov/dep/service/online/trasmfrm.shtml>) have been submitted to:

Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211



BWP AQ 22

Municipal Waste Combustor - Emission Control Plan (ECP)

Transmittal Number _____

Facility ID# (if known) _____

A. Facility Information

Important:

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



1. Facility:

Facility Name _____

Street Address _____

City _____

State _____

Zip Code _____

Mailing address (if different from above):

Street Address _____

City _____

State _____

Zip Code _____

2. Facility Contact Person:

Name _____

Title _____

Telephone Number (include area code and extension) _____

3. Facility Owner:

Owner or Corporation Name _____

Telephone Number (include area code and extension) _____

B. Facility Description and Plant Schematic (Attach Separate Sheet)

C. Incinerator Unit (Complete Section C for each unit)

1. Unit Number _____

2. Manufacturer _____

3. Model Number _____

4. Maximum Continuous Rated Design Capacity:

a. Heat Input _____

MMBtu/hr

b. Steam Load _____

lbs/hr

5. Waste Type _____



BWP AQ 22

Municipal Waste Combustor - Emission Control Plan (ECP)

Transmittal Number _____

Facility ID# (if known) _____

C. Incinerator Unit (cont.)

6. Heat Recovery? Yes No

a. Steam Flow Meter (or Feedwater Meter) _____

b. Manufacturer(s) or Equivalent _____

c. Model Number _____

d. Maximum Rating _____
lb/hr

7. Auxiliary Burners:

a. Manufacturer(s) or Equivalent _____

b. Model Number _____

c. Type of Fuel Used _____

d. Maximum rating _____
Btu/hr

8. Date of Installation _____

D. Existing Permits

1. In the Table below list all existing Plan Approvals the facility is currently subject to, including specific emission limits. One objective of the ECP is to minimize redundant recordkeeping by the facility while at the same time improving the reporting requirements by having all pertinent information reported in a uniform and standardized format.

Since 310 CMR 7.08(2) establishes emissions limits in terms of concentrations, all existing Plan Approval emission limits shall be converted to concentrations. The methodology involved in converting existing emission limits (e.g. lbs/MMBtu) to concentrations (e.g. mg/dscm) must be included in this ECP along with detailed calculations, references and any assumptions made in the conversion. (Attach Separate Sheet)

Approval Number	Regulated Pollutants	Current Emission Limits	Converted Emission Limits	Averaging Time
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____



BWP AQ 22

Municipal Waste Combustor - Emission Control Plan (ECP)

Transmittal Number _____

Facility ID# (if known) _____

E. Emissions Control for PM, OPACITY, HCl, SO₂, Cd and Pb

(Complete Section E for each unit)

1. Existing Controls: (If none, check here)

	PM, Opacity, Cd and Pb	HCl and SO ₂
Type	_____	_____
Manufacturer(s) or Equivalent	_____	_____
Model	_____	_____
Date of Installation	_____	_____
Expected Useful Life of the Equipment	_____	_____
Efficiency of Unit	_____	_____
Capacity of the Unit	_____	_____
	scfm	scfm

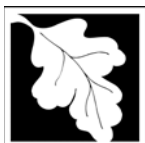
2. Proposed Controls: (If none, check here)

	PM, Opacity, Cd and Pb	HCl and SO ₂
Type	_____	_____
1 - Fabric Filter use form BWP AQ SFC-1 2 - ESP use form BWP AQ SFC-6 3 - Spray Dryer use form BWP AQ SFC-3 4 - Other (See attached instructions)		

Are Existing Emission Controls Being Removed? Yes No

3. Emissions Limitations:

	Proposed Emission Limits: (mg/dscm, ppmv @ 7% O ₂)	Average Time if Applicable
PM	_____	_____
Cd	_____	_____
Pb	_____	_____
SO ₂	_____	_____
HCl	_____	_____
Opacity	_____	_____



BWP AQ 22

Municipal Waste Combustor - Emission Control Plan (ECP)

Transmittal Number _____

Facility ID# (if known) _____

E. Emissions Control for PM, OPACITY, HCl, SO₂, Cd and Pb (cont.)

4. Standard Operating and Maintenance Procedures: (Shall be submitted prior to operation):

F. Emissions Control for Mercury

Proposed Controls If Not Activated Carbon Injection System: (Attach Separate Sheet)

Activated Carbon Injection System:

1. Process Description: _____

2. Process Parameters:	Unit 1	Unit 2	Unit 3
a. Flue Gas Flow Rate Per Unit:	_____	_____	_____
	dscm/min@7%O ₂	dscm/min@7%O ₂	dscm/min@7%O ₂
b. Estimated Maximum Uncontrolled Mercury Concentration:	_____	_____	_____
	mg/dscm@7%O ₂	mg/dscm@7%O ₂	mg/dscm@7%O ₂

3. Design Parameters:	Unit 1	Unit 2	Unit 3
a. Design Control Emission Limitation:	_____	_____	_____
	mg/dscm@7%O ₂	mg/dscm@7%O ₂	mg/dscm@7%O ₂
b. Design Control Efficiency at Maximum Estimated Uncontrolled Mercury Concentration:	_____	_____	_____
	%	%	%

4. Carbon Handling:				
a. Raw Materials	% Residual Volatile Content	Internal Surface Area	Average Pore Radius	
_____	_____	_____	_____	
		m ² /g	meters	
_____	_____	_____	_____	
		m ² /g	meters	
_____	_____	_____	_____	
		m ² /g	meters	

5. Carbon Storage Facility:

a. Type of Tank, Bin or Hopper: _____

Dimensions: _____ Capacity: _____



BWP AQ 22

Municipal Waste Combustor - Emission Control Plan (ECP)

Transmittal Number _____

Facility ID# (if known) _____

G. Emission Control for Nitrogen Oxides (cont.)

5. Reagent Storage Facility:

a. Type of Tank, Bin or Hopper: _____

Dimensions: _____ Capacity: _____

b. Is Dust and/or Vapor Collector Required? Yes No

1. If yes, submit detailed data for the dust and/or vapor collection equipment, such as, but not limited to, capture efficiency, temperature capability, maximum capacity, and method of cleaning

6. Standard Operating and Maintenance Procedures (Shall be submitted prior to operation)

H. Fugitive Ash Handling Emission Controls

1. Description of Existing Controls (Attach Separate Sheet)
2. Description of Proposed Controls (Attach Separate Sheet)
3. Standard Operating and Maintenance Procedures (Shall be submitted prior to operation)

I. Retrofit Schedule

Municipal Waste Combustor Facilities Requiring Longer Than 18 Months to Comply with the Regulation Shall Provide the Following:

1. Dates of all existing contract awards involving air pollution control systems or for process modifications. Dates for issuance of any additional orders for the purchase of air pollution control equipment. All contracts necessary to bring the municipal waste combustor unit(s) into compliance shall be executed no later than eighteen months from the effective date of the regulation.
2. Date initiating on-site construction or installation of air pollution control equipment or process modification, as necessary. This date shall not exceed twenty four months from the effective date of the regulation.
3. Date the completion of on-site construction or installation of air pollution control equipment, or process modification will be achieved. This date shall not exceed thirty months from the effective date of this regulation, but no later than November 19, 2000.



BWP AQ 22

Municipal Waste Combustor - Emission Control Plan (ECP)

Transmittal Number

Facility ID# (if known)

J. Professional Engineer Certification

The seal and signature of a Massachusetts Registered Professional Engineer must be entered below. This certifies that the information contained in this application has been checked for accuracy, and that the design represents good air pollution control engineering practice.

Print Name

Authorized Signature

Position/Title

Representing

Date

P.E. #

K. Affirmative Demonstration of Compliance

The signature below provides the affirmative demonstration pursuant to 310 CMR 7.08(2) j.3. that any facility(ies) in Massachusetts, owned or operated by the proponent for this project (or by an entity controlling, controlled by or under common control with such proponent) that is subject to 310 CMR 7.00, et seq. and 310 CMR 19.00, et seq., is in compliance with, or on a Department approved compliance schedule to meet, all provisions of 310 CMR 7.00, et seq. and 310 CMR 19.00 et seq., and any plan approval, order, notice of noncompliance or permit issued thereunder. This form must be signed by a reasonable official working at the location of the proposed new or modified facility. Even if an agent has been designated to fill out this form, the responsible official must sign it. (Refer to the definition given in 310 CMR 7.00.)

I certify that I have examined the responses provided herein and that to the best of my knowledge they are true and complete.

Print Name

Signature of Responsible Official

Position/Title

Representing

Date



BWP AQ SFC-1 (for use with BWP AQ CPA-3)

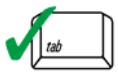
Supplemental Form for Dry Air Filters

Transmittal Number _____

Facility ID# (if known) _____

A. Plan Application Requirements

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



This form is to be submitted together with form BWP AQ CPA-1, CPA-3, or CPA-4, whenever the construction, substantial reconstruction or alteration of a **DRY AIR FILTER** is desired.

B. Project Location

- Name of Facility _____
- Location of project site:
 Street _____
 City/Town _____ Zip Code _____

C. Equipment Specifications

DEP Use Only
Permit No. _____
Received Date _____
Reviewer _____
Permit <input type="checkbox"/> Approved <input type="checkbox"/> Denied
Decision Date _____

- Manufacturer _____
- Model# (attach manufacturer's brochures and specifications) _____
- What is the capacity of the unit?
 ACFM _____ in. W.G. pressure drop _____
- How many compartments are in the unit? _____
- How many filter elements are in each compartment? _____
- What type of filter material is used? _____
- Is the filter material: woven? non-woven?
- What is the maximum recommended temperature? (°F). _____
- Describe filter elements (tubes, envelopes, cartridges, other) _____
- What is the real effective area per filter element (ft.²) _____



Transmittal Number _____

Facility ID# (if known) _____

D. Operating Conditions for this Permit

1. What is the average inlet gas flow? _____
(ACFM, wet)
2. What is the moisture content in the inlet? _____
(lbs/min) (grains/ACF)
3. What is the face velocity? _____
(ft/sec)
4. What are the gas temperatures (°F, dry bulb) for the _____
inlet? _____ outlet?
5. What is the pressure drop across the unit? (in. W.G.) _____
minimum _____ maximum

NOTE: Supporting calculations and explanatory notes must be attached.

E. Particulate Collection Data

1. Describe the particle size weight to be emitted by the proposed unit:

	% of total weight	% of fraction collected
a. < 1 micron:	_____	_____
b. 1 micron < 10 microns:	_____	_____
c. 10 microns < 50 microns:	_____	_____
d. > 50 microns:	_____	_____
2. What is the overall particulate collection efficiency? _____
3. What is the inlet particulate concentration? (gr/ACF) _____
4. What is the outlet particulate concentration? (gr/ACF) _____
5. What is the emission rate? (lbs/hr) _____

F. Cleaning Procedures and Particulate Disposal

1. Describe the cleaning mechanism (pulse jet, reverse jet, sonic, rapping, or other) _____
2. What is the estimated time between cleaning phases? _____
Seconds
3. How many filter elements are cleaned at the same time? _____



Transmittal Number _____

Facility ID# (if known) _____

I. Failure Notification

1. How is the failure of the dry air filter made known to the operator during normal operations (e.g. audible alarm, flashing lights, temperature indicator, pressure indicator, etc.)?

2. Describe the record keeping procedures to be used in identifying the cause, duration and resolution of each failure (use a separate page if necessary)

NOTE: The regional office must be notified immediately by telephone in the event of a dry air filter failure.

J. Certification

The seal and signature of a Massachusetts Registered Professional Engineer must be entered to the right. This certifies that the information contained in this form has been checked for accuracy, and that the design represents good air pollution control engineering practice. (These must be originals; no photocopies, etc. of the seal and signature will be accepted.)

Print Name _____

Authorized Signature _____

Position/Title _____

Representing _____

Date _____

P.E. # _____



Transmittal Number _____

Facility ID# (if known) _____

A. Plan Application Requirements

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



This form is to be submitted together with forms BWP AQ CPA1, CPA3 or CPA4, prior to the construction, substantial reconstruction or alteration of **Wet Collection Equipment**.

B. Project Location

1. Name of facility: _____

2. Location of project site:

Street _____

City/Town _____

Zip Code _____

C. Wet Collection Equipment Specifications

DEP Use Only

Permit No. _____

Received Date _____

Reviewer _____

Permit
 Approved
 Denied

Decision Date _____

1. Manufacturer _____

2. Model # _____

3. What is the capacity of the unit? _____

SCFM

@ standard temperature of °F

4. What type of unit is being installed? (e.g. gravity spray tower, plate scrubber, venturi scrubber, packed bed scrubber, centrifugal spray scrubber, other):

5. What material is the outer shell made of? (mild steel, stainless steel, non-ferrous metal, plastic, other)

6. What material is the inner shell made of?



BWP AQ SFC-3 (for use with BWP AQ CPA-3)

Supplemental Form for Wet Collection Equipment

Transmittal Number _____

Facility ID# (if known) _____

D. Operating Parameters (cont.)

5. What is the outlet gas flow rate? _____
ACFM, wet
6. What is the normal oxidation/reduction potential set point range? _____
7. What is the normal pH set point range? _____

E. Emission Data

1. Give the maximum gaseous emission rates at stack exit:

	Chemical Name	Before Control (lbs/hr)	After Controls (lbs/hr)	After Controls (ug/DSCM*)
a.	_____	_____	_____	_____
b.	_____	_____	_____	_____
c.	_____	_____	_____	_____

* DSCM = Dry Standard Cubic Meter

2. What is the overall gaseous collection efficiency? _____
%

3. Give the maximum particulate emission rates at stack exit:

	Chemical Name	Before Control (lbs/hr)	After Controls (lbs/hr)	After Controls (ug/DSCM*)
a.	_____	_____	_____	_____
b.	_____	_____	_____	_____
c.	_____	_____	_____	_____

* DSCM = Dry Standard Cubic Meter

4. Describe the particulate size for the proposed unit: (include citations of test data or a list of references used):

	% of total	% of fraction collected
a. < 1 micron:	_____	_____
b. 1 micron < 10 microns:	_____	_____
c. 10 microns < 50 microns:	_____	_____
d. > 50 microns:	_____	_____



F. Description of Scrubbing Liquid (cont.)

10. Give a description of the chemical additive(s) used:

	Chemical Name	Max. Feed Rate (lbs/hr)	% Strength (as mixed w/ water)	Reaction Products
a.	_____	_____	_____	_____
b.	_____	_____	_____	_____
c.	_____	_____	_____	_____

11. Give a detailed description of the contaminants transferred to the scrubbing liquid:

a. Liquid/solid contaminants: _____
lbs/hr

briefly describe: _____

b. Gases absorbed: _____
lbs/hr

briefly describe: _____

c. Are these contaminants subject to 310 CMR 30.00 pertaining to the control of Hazardous Waste?

Yes No

If yes, identify the company which will dispose of the contaminated scrubbing liquid:

d. Is a discharge permit (BWPIWW02) needed?

Yes No

If Yes, attach copy of the permit

The following six sections ask questions about specific types of wet collection equipment. The applicant should respond only to those questions pertaining to the proposed unit.

G. Gravity Spray Tower Scrubber

1. What type of spray nozzles will be installed? (pressure, rotating, gas atomizing, sonic, other, explain):



G. Gravity Spray Tower Scrubber (cont.)

2. How many nozzles will be installed? _____
3. Give the location of each nozzle: _____
4. What is the pressure drop across the nozzles? _____
psig
5. What is the normal liquid to gas ratio? _____
by weight
specify units _____
6. Give the cross sectional area of the tower: _____
square feet
7. What is the height of the tower? _____
feet
8. What is the superficial gas velocity? _____
feet/second
9. Is the gas flow: concurrent? countercurrent?
10. What is the gas retention time? _____
seconds
11. Is a mist eliminator used? Yes No
12. Are baffles present? Yes No
13. Does the unit have liquid redistributors? Yes No
14. Describe other features:

H. Centrifugal Spray Scrubber

1. What is the normal liquid to gas ratio? _____
by weight
specify units _____
2. What is the height of the unit? _____
feet
3. What is the diameter of the unit? _____
feet
4. What is the retention time of the gas? _____
seconds
5. Is the spray directed outward? Yes No



H. Centrifugal Spray Scrubber (cont.)

6. What type of spray nozzles will be installed? (pressure, rotating, gas atomizing, sonic, other, explain)

I. Plate Scrubber

1. What is the normal liquid to gas ratio?

by weight

specify units

2. What is the cross sectional area?

square feet

3. What is the height of the unit?

feet

4. How many trays are there?

5. What is the spacing between the trays?

6. List and describe briefly, the type of tray to be used (sieve, impingement, bubble cap, valve, other):

7. What is the depth of the liquid seal?

inches

8. What is the size of the tray active area?

square inches

9. What is the size of the tray downcomer area?

square inches

10. What is the size of the tray perforation area?

square inches

11. What is the number of liquid passes per tray?

12. What is the type of flow?

cross, counter, cascade, split

13. List other internal features:



J. Venturi Scrubbers

1. What is the normal liquid to gas ratio? _____

by weight

specify units

2. Is the throat adjustable? Yes No

3. If Yes, how is it controlled? (describe briefly):

4. How large is the throat area? _____

square inches

5. What is the shape of the throat cross section? _____

6. What is the throat pressure drop? _____

inches of water

7. What is the throat velocity? _____

feet/second

K. Packed Bed Scrubber

1. What is the normal liquid to gas ratio? _____

by weight

specify units

2. What is the height of the bed? _____

feet

3. What is the cross sectional area of each bed? _____

square feet

4. Describe the type of packing element: _____

5. What is the size of the packing element? _____

inches

6. Is the packing: random? stacked? other?

If other, explain: _____

7. How many stages are there? _____

8. What is the packing factor (as given by manufacturer)? _____

9. What is the height of the transfer unit? _____

feet

10. How many transfer units per bed are there? _____

11. What is the liquid flooding point? _____

cubic feet/second

12. What is the gas loading point? _____

cubic feet/second



K. Packed Bed Scrubber (cont.)

13. The operating point is what % of the flooding point? _____

%

14. What is the pressure drop per foot of packing? _____

inches of water

15. Describe the packed bed (crossflow, counterflow, parallel flow, fluid bed, flooded bed, other):

16. What is the number of liquid redistributors? _____

17. What is the distance between the liquid redistributors? _____

inches

(Attach separate sheet if necessary)

L. Failure Notification

1. How is the failure of the collection device made known to the operator? (e.g. audible alarm, lights, etc.):

2. Describe the record keeping procedures that will be used in identifying the cause, duration, and resolution of each failure (use a separate page if necessary):

M. Certification

The seal and signature of a Massachusetts Registered Professional Engineer must be entered to the right. This certifies that the information contained in this form has been checked for accuracy, and that the design represents good air pollution control engineering practice. (These must be originals; no photocopies, etc. of the seal and signature will be accepted.)

Print Name

Authorized Signature

Position/Title

Representing

Date

Date



BWP SFC-6 (for use with BWP AQ 02, 03)

Supplemental Form for Electrostatic Precipitator

A. Plans Application Requirements

This form is to be submitted together with form BWP AQ CPA-1, CPA-3, or CPA-4, whenever the modification or the installation of an **Electrostatic Precipitator** is desired.

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



B. Project Location

Name of facility _____

Location of project site _____

Street Address _____

City/town _____

State _____

Zip code _____

C. Equipment Specifications

1. Manufacturer _____
2. Model number _____
3. What is the capacity of the unit? _____
SCFM
4. Describe the stages:
 - a. Single stage _____
 - b. Two-stage _____
5. Does the units use: Plates Tubes
6. How many power units are there? _____

D. Conditions in the Gas Stream

1. What the inlet gas flow? _____
acfm, wet
2. What the moisture content in the inlet? _____
lbs./min.
3. What is the inlet velocity? _____
feet./second
4. Describe the gas temperature:

inlet gas temperature (°F) _____

outlet gas temperature (°F) _____
5. Is the inlet steam pre-cooled? Yes No



BWP SFC-6 (for use with BWP AQ 02, 03)

Supplemental Form for Electrostatic Precipitator

E. Description of Particulate Pollutant

1. Give a brief description of the particulate/aerosol in gas stream (chemical analysis):

NOTE: The answers to the following questions require supporting calculations and explanatory notes before they can be accepted as part of the plan review.

2. Describe the particle size to be emitted by the proposed unit (in microns):

	% of total weight	% of fraction collected
a. < 1 micron:	_____	_____
b. ≥ 1 < 10 microns:	_____	_____
c. ≥ 10 < 50 microns:	_____	_____
d. > 50 microns:	_____	_____

3. Overall particulate collection efficiency: _____

4. Inlet particulate concentration: _____
grns./acf

5. Outlet particulate concentration: _____
grns./acf

6. Emission rate: _____
lbs./hour

7. Particulate resistivity _____
ohm-cm

8. Temperature at resistivity _____
°F

9. Measure of % water at resistivity _____

10. Is the inlet stream conditioned? Yes No

If yes, explain: _____

11. Is the inlet stream pre-cleaned? Yes No

If yes, explain: _____



BWP SFC-6 (for use with BWP AQ 02, 03)

Supplemental Form for Electrostatic Precipitator

F. Warning System

1. Describe the warning/alarm system that protects against operation when unit is not meeting design efficiency:

G. Power Requirements

1. Describe the power requirements, if the unit is single stage:

a. How is the power applied?

watts/1000acfm

b. What is the voltage applied?

kilovolts

2. Describe the power requirements, if the unit is two stage:

a. How much power is applied

watts/1000acfm

b. What is the ionizer voltage applied

kilovolts

c. What is the number of ionizer banks?

d. What is the collector voltage

kilovolts

3. Describe the transformer rectifier sets:

a. How many transformer rectifier sets are there?

b. What is the size of the transformer rectifier sets?

4. Describe the discharge electrode:

a. What length of wire is used?

b. What type of wire is used?

Weighted

Rigid

Electrode

c. Is the wire shrouded?

Yes

No



BWP SFC-6 (for use with BWP AQ 02, 03)

Supplemental Form for Electrostatic Precipitator

H. Plate or Tube Data

1. Describe the plate dimensions (if applicable):

a. What is the height of the plate? _____

b. What is the length of the plate? _____

c. What is the thickness of the plate? _____

d. How many plates are there? _____

e. What is the spacing between the plates? _____

2. Describe the tube dimensions:

a. What is the height of the tube? _____

b. What is the inside diameter of the tube? _____

c. What is the outside diameter of the tube? _____

d. How many tubes are there? _____

e. What is the spacing between the tubes? _____

I. Particulate Removal Form Collection Electrodes

1. Thickness of the particulates at cleaning: _____

2. Method is used in cleaning the electrodes: _____

3. How often are the electrodes cleaned? _____

4. How many collection hoppers are there? _____

5. What is the capacity of each hopper? _____

6. How often are the hoppers cleaned? _____

7. What type of rapper is used? _____

8. What type of rapper control is used? _____

magnetic, pneumatic, etc.

9. What is the total time per cleaning sequence? _____

10. What is the ultimate disposal method? _____



BWP SFC-6 (for use with BWP AQ 02, 03)

Supplemental Form for Electrostatic Precipitator

J. Miscellaneous Data

1. Pressure drop across the unit: _____
in. water
2. Residence time of gases in the collection zone: _____
seconds
3. How many fields are there? _____
4. What is the size of the fields? _____
5. What is the field efficiency? _____
% each field
6. What is the aspect ratio? _____
7. What is the superficial velocity? _____
8. What type of insulators are used? _____
9. Describe the specific collecting area (SCA) (sq. ft/1000 ACFM):

10. Describe the specific corona power (SCP) (watts/1000 ACFM):

K. Certification

The seal and signature of a Massachusetts Registered Professional Engineer must be entered below. This certifies that the information contained in this form has been checked for accuracy, and that the design represents good air pollution control engineering practice. (These must be originals; no photocopies, etc. of the seal and signature will be accepted.)

Print name

Authorized signature

Position/title

Representing

Date

PE number