

OMB Control Number: 2040-XXXX  
Approval Expires: 05/dd/2013

Plant ID: Insert Plant ID  
Plant Name: Insert Plant Name



## Steam Electric Questionnaire

### PART B - FLUE GAS DESULFURIZATION (FGD) SYSTEMS

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Plant ID: Insert Plant ID  
Plant Name: Insert Plant Name

## **PART B. FLUE GAS DESULFURIZATION (FGD) SYSTEMS**

### **INSTRUCTIONS**

Part B requests information about flue gas desulfurization (FGD) systems that are located at the plant or are planned to be located at the plant. Complete Part B if you operate one or more FGD systems, or if you are currently constructing/installing or planning to construct/install one or more FGD systems by December 31, 2020.

Throughout Part B, information is requested on FGD systems that are under construction/installation or planned to be constructed/installed by December 31, 2020. Provide design information, or best engineering estimates as necessary, for these planned systems.

As you are completing the electronic form, note the following: When you enter your plant name and plant ID on the Part B Table of Contents tab, all name and ID fields throughout Part B will automatically populate. Refer to the overall questionnaire instructions, the glossary, and the acronym list for assistance with completing Part B.

Please provide all free response answers in the highlighted yellow areas. Throughout Part B, you may need to make copies of certain sections/questions for multiple FGD systems. Instructions are provided throughout Part B regarding making copies. Note that system ID fields must be populated on the copied tab or section, located in the upper right corner under "Plant ID" and "Plant Name", in order to correlate the requested information with the correct system.

Use the Part B Comments tab to do the following: provide additional information as requested in certain questions within Part B; indicate atypical data (e.g., if 2009 information is not representative of normal operations); and note methods used to make best engineering estimates in the event that exact data are not available.

Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name

**Part: B**  
**Section Title: 1. General FGD System Information**  
**Instructions:** Part B requests information about flue gas desulfurization (FGD) systems that are located at the plant or are planned to be located at the plant that are used to service fossil-fueled electric generating units. See Part A Section 8 for unit classifications. Complete Part B if you operate one or more *FGD systems*, or if you are currently constructing/installing or planning to construct/install one or more FGD systems by December 31, 2020, to service fossil-fueled electric generating units.

**CBI?**  
 Yes

**B1-1.** Does the plant operate one or more flue gas desulfurization (FGD) systems that service fossil-fueled steam electric generating units, or is the plant currently constructing/installing or planning to construct/install one or more FGD systems to service fossil-fueled steam electric generating units by December 31, 2020?

Yes (Continue)  
 No (Skip to next Questionnaire Part)

**CBI?**  
 Yes

**B1-2.** Complete Table B-1 for each FGD system that the plant operates that services fossil-fueled electric generating units, or is currently constructing/installing or planning to construct/install to service fossil-fueled electric generating units by December 31, 2020. Assign an FGD system ID to each FGD system using the drop down menu provided. Assign the FGD systems sequentially using the numbered IDs (e.g., FGD-1, FGD-2) for the systems currently operating. Assign the FGD systems sequentially using the lettered IDs (e.g., FGD-A, FGD-B) for the systems that are planned to operate. Enter the date the system initially began operation or is planned to begin operation. Identify each steam electric unit (currently operating or planned units) that is serviced by each FGD system using the codes EPA assigned to steam electric units in Table A-8 and/or Table A-9. Identify the type of oxidation performed in the FGD system for all wet FGD systems (Note: mark "Not Applicable" for dry FGD systems). Also provide the design or actual sulfur dioxide removal efficiency for each FGD system.

Wet FGD systems capture sulfur dioxide from the flue gas using a wet slurry that generates a *process wastewater* that exits the scrubber absorber, shown as *FGD slurry blowdown* in Figure B-1 for recirculation scrubbers, or as *FGD slurry discharge* in Figure B-2 for single pass scrubbers. Indicate for each FGD system if FGD slurry blowdown (or FGD slurry discharge) is generated.

Use the drop down boxes to identify the type of FGD system and to specify the type(s) of sorbents used in the system. If a sorbent used is not provided in the drop down, identify "other" and provide the type(s) of sorbent in the yellow highlighted box to the right.

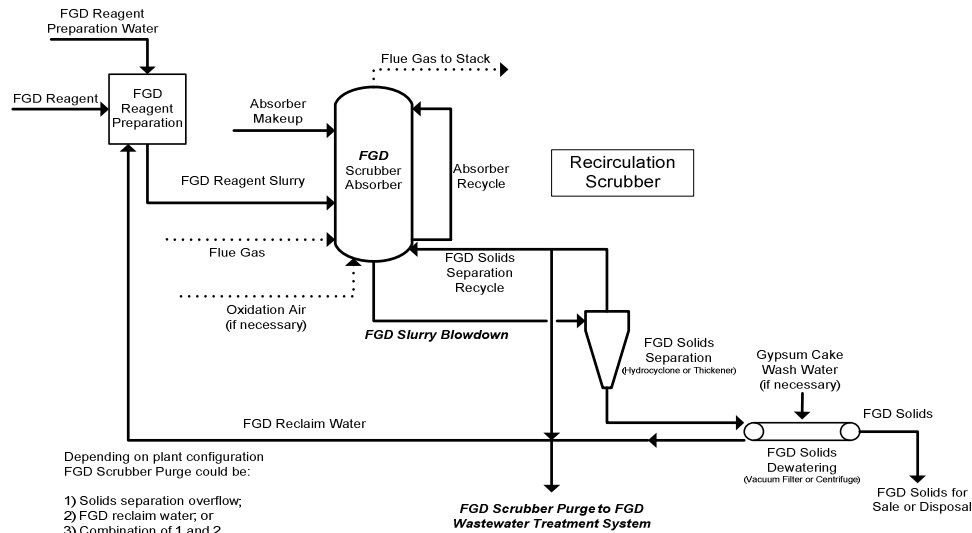


Figure B-1. Example Recirculation Wet FGD Scrubber System Diagram

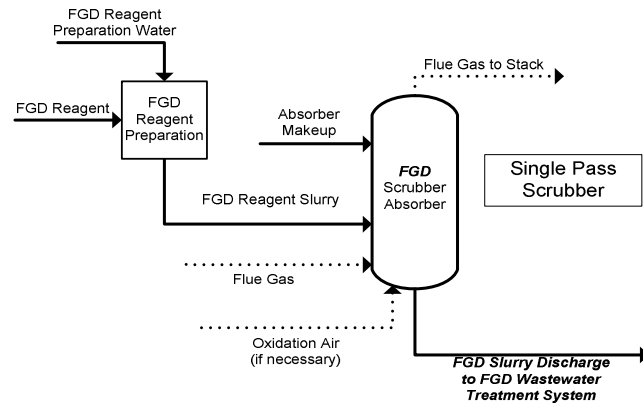


Figure B-2. Example Single Pass Wet FGD Scrubber System Diagram

Table B-1. FGD Systems in Operation or Planning to be Operated by December 31, 2020

FGD System ID	Date System Initially Brought On Line, or Planned to be Brought On Line (month/year)	Steam Electric Units from Table A-8 and/or A-9 Serviced by This FGD System [check all boxes that apply]	Does (or Will) the System Generate a FGD Slurry Blowdown (or Slurry Discharge) Stream (i.e., is it a wet system)?	Type of Oxidation (Forced, Natural, or Inhibited)	Type of FGD System	Type of Sorbent		Sulfur Dioxide Removal Efficiency (%)
						Primary:	Secondary:	
Example: FGD-1	01/1995	<input checked="" type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input checked="" type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Spray	Primary: Limestone Secondary: Soda Ash Tertiary: Not Applicable Quaternary: Not Applicable	97.5	
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		
FGD System ID		<input type="checkbox"/> SE Unit 1 <input type="checkbox"/> SE Unit 6 <input type="checkbox"/> SE Unit A <input type="checkbox"/> SE Unit 2 <input type="checkbox"/> SE Unit 7 <input type="checkbox"/> SE Unit B <input type="checkbox"/> SE Unit 3 <input type="checkbox"/> SE Unit 8 <input type="checkbox"/> SE Unit C <input type="checkbox"/> SE Unit 4 <input type="checkbox"/> SE Unit 9 <input type="checkbox"/> SE Unit D <input type="checkbox"/> SE Unit 5 <input type="checkbox"/> SE Unit 10	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Forced <input type="radio"/> Inhibited <input type="radio"/> Natural <input type="radio"/> Not Applicable	Type of FGD System	Primary: Type of Sorbent Secondary: Type of Sorbent Tertiary: Type of Sorbent Quaternary: Type of Sorbent		

Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name

**Part: B**  
**Section Title: 2. Planned FGD System Information**

**Instructions:** Throughout this section, provide information for all *FGD systems* under construction/installation or planned to be constructed/installed by December 31, 2020 that are reported in Table B-1 and are expected to generate *FGD slurry blowdown*. Please provide all free response answers in the highlighted yellow areas.

**CBI?**

Yes

**B2-1.** Complete Table B-2 for each FGD system under construction/installation or planned to be constructed/installed by December 31, 2020 that is reported in Table B-1 and is expected to generate FGD slurry blowdown. Enter the planned method for handling solids generated, whether *FGD scrubber purge* (or *slurry discharge*) will be generated, the type of *wastewater treatment system*, the design maximum and 24-hour daily average flow rate for the treatment system, and the date the treatment system will be brought on line. Use codes from the Code Tables tab, as appropriate, and separate multiple entries with commas. If you do not know the type of wastewater treatment system that will be installed or the flow rate of the treatment system, enter "Unknown" into the appropriate columns in the table.

**Table B-2. FGD Systems Planned or Under Construction/Installation**

FGD System ID	Planned Solids Handling for the FGD Slurry Blowdown (See Solids Handling Table in Code Tables Tab) <sup>a</sup>	Will System Generate FGD Scrubber Purge (or Slurry Discharge)?	Will FGD Scrubber Purge (or Slurry Discharge) be Treated by New or Existing Treatment System	Type of Wastewater Treatment System Planned to Treat FGD Scrubber Purge (or Slurry Discharge) (See Wastewater Treatment Units Table in Code Tables Tab)	Design Flow Rate for FGD Treatment System		Estimated Date the New FGD Treatment System Will be Brought On Line (or Date FGD Scrubber Purge (or Slurry Discharge) Will be Transferred to Existing System) (month/year)
					Maximum (gpm)	24-Hour Daily Average (gpm)	
<i>Example</i> FGD-A	<i>HYC-1, VFB-1</i>	Yes	New	<i>EQ-P, CP-1-1, CL-P-1, PH-1, FLT-S-1</i>	<i>1,200</i>	<i>1,000</i>	<i>06/2012</i>
FGD System ID (Planned)		Yes/No	New/Existing				
FGD System ID (Planned)		Yes/No	New/Existing				
FGD System ID (Planned)		Yes/No	New/Existing				
FGD System ID (Planned)		Yes/No	New/Existing				
FGD System ID (Planned)		Yes/No	New/Existing				
FGD System ID (Planned)		Yes/No	New/Existing				

a – This question refers to the blowdown solids handling, *not* the treatment system solids handling.

Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name

**Part: B**  
**Section Title: 3. FGD Additive Information**

**Instructions:** Throughout this section, provide information for all *FGD Systems* listed in Table B-1. Please provide all free response answers in the highlighted yellow areas.

**CBI?**  Yes

**B3-1.** In Table B-3, indicate the additive(s) used or planned to be used in each FGD system listed in Table B-1, and provide a description of its purpose.  
 [Check all boxes that apply.]

**Table B-3. FGD Additive Information**

Additive	FGD System(s) in which Additive is Used or is Planned to be Used	Purpose of Additive
Adipic acid	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):
Dibasic acid (DBA)	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):
Elemental sulfur	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):
Formic acid	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):
Organosulfide	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):
Sodium thiosulfate	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):

Other (specify below): _____	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):
Other (specify below): _____	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	<input type="checkbox"/> Increase sulfur dioxide removal <input type="checkbox"/> Increase mercury removal <input type="checkbox"/> Defoaming agent <input type="checkbox"/> Inhibit oxidation of FGD solids <input type="checkbox"/> Scale inhibitor <input type="checkbox"/> Other (specify below):
None	<input type="checkbox"/> FGD 1 <input type="checkbox"/> FGD 4 <input type="checkbox"/> FGD A <input type="checkbox"/> FGD 2 <input type="checkbox"/> FGD 5 <input type="checkbox"/> FGD B <input type="checkbox"/> FGD 3 <input type="checkbox"/> FGD 6 <input type="checkbox"/> FGD C	



Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name  
 FGD System ID: Insert System ID

**Part: B**

**Section Title: 4. Wet FGD System Information**

**Instructions:** Throughout this section, you will be required to provide information for each *wet FGD system* that the plant operates, reported in Table B-1. This section does not need to be completed for planned systems. Please provide all free response answers in the highlighted yellow areas.

**Make copies of Section 4 and the Section 4 tables for each wet FGD system previously defined in Table B-1 using the "Copy Section 4 and Section 4 Tables" button below. Please note that you will create two new tabs for these sections. You may delete unneeded tabs, if accidentally created. Enter the FGD system ID in the space provided above (use FGD system IDs assigned in Table B-1).**

**CBI?**

Yes

**B4-1.** Did you report use of a FGD system that generates *FGD slurry blowdown* (i.e., wet system) in Table B-1?

- Yes (Continue)
- No [\(Skip to Section 8\)](#)

**Copy Section 4 and Section 4 Tables**

**CBI?**

Yes

**B4-2.** Provide the operating concentration range of chlorides within the *FGD scrubber absorber*.

Minimum operating concentration:  ppm

Maximum operating concentration:  ppm

**CBI?**

Yes

**B4-3.** Provide the maximum design chlorides concentration for the FGD system and indicate which specific equipment unit(s) of the FGD system determine this concentration (e.g., FGD scrubber absorber, piping). Also provide the materials of construction for the specific FGD equipment that determine the maximum design chlorides concentration. If multiple materials are used in the construction of the FGD equipment that determines the maximum design chlorides concentration, identify the component that is the most vulnerable to corrosion due to chlorides concentrations. If the material of construction is not provided in the drop down menu, select "other" and provide the name in the yellow box provided.

FGD system maximum design chlorides concentration:  ppm

FGD equipment that determines maximum design concentration:  Materials of Construction

FGD equipment that determines maximum design concentration:  Materials of Construction

FGD equipment that determines maximum design concentration:  Materials of Construction

FGD equipment that determines maximum design concentration:  Materials of Construction

**CBI?**

Yes

**B4-4.** Indicate the FGD system parameter(s) that are used to determine when the FGD slurry is blown down from the FGD system. [Check all boxes that apply.]

Chlorides concentration, maintained less than  ppm

Solids percentage, maintained between  and  %

Other, explain:

**CBI?**

Yes

**B4-5.** For water sources that may be used as a source of FGD reagent preparation water or absorber make-up water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and maximum solids percentage that is acceptable for the water to be used for those purposes. Identify any other criteria that the source water must meet.

Chlorides concentration:  ppm

Solids percentage:  %

Other, explain:

**CBI?**

Yes

**B4-6.** Provide the typical flow rate, duration, and frequency of the mist eliminator wash water for the FGD system for calendar year 2009. Provide 2010 data for systems that were not operating in 2009.

gpm

hpd

dpy

**CBI?**  Yes **B4-7.** Provide the typical flow rate, duration, and frequency of the FGD reagent preparation water for the FGD system for calendar year 2009. Provide 2010 data for systems that were not operating in 2009.

gpm  
 hpd  
 dpy

**CBI?**  Yes **B4-8.** Provide the typical flow rate, duration, and frequency of the FGD reagent slurry for the FGD system for calendar year 2009. Provide 2010 data for systems that were not operating in 2009.

gpm  
 hpd  
 dpy

**CBI?**  Yes **B4-9.** Provide the typical flow rate, duration, and frequency of the absorber make-up water for the FGD system for calendar year 2009. Provide 2010 data for systems that were not operating in 2009.

gpm  
 hpd  
 dpy

**CBI?**  Yes **B4-10.** Provide the source of the mist eliminator wash water used. [Check all boxes that apply.] If the source is a *process wastewater* not provided in the dropdown box, select other and provide in the yellow box the name of the process wastewater and a short description.

- Raw intake water
- Intake water that has been treated on site prior to use
- Process wastewater Process Wastewater ▼
- Other, explain:

**CBI?**

Yes

**B4-11.** Provide the source of the FGD reagent preparation water used. [Check all boxes that apply.] If the source is a *process wastewater* not provided in the dropdown box, select other and provide in the yellow box the name of the process wastewater and a short description.

Raw intake water

Intake water that has been treated on site prior to use

Process wastewater Process Wastewater ▼

Other, explain:

**CBI?**

Yes

**B4-12.** Provide the source of the absorber make-up water used. [Check all boxes that apply.] If the source is a *process wastewater* not provided in the dropdown box, select other and provide in the yellow box the name of the process wastewater and a short description.

Raw intake water

Intake water that has been treated on site prior to use

Process wastewater Process Wastewater ▼

Other, explain:

**CBI?**

Yes

**B4-13.** Indicate the type of solids that are generated within the FGD scrubber system. Also provide the approximate percent of the total FGD solids generated within the FGD system for each type (e.g., 85% calcium sulfate, 15% calcium sulfite).

Calcium sulfate (gypsum) % FGD solids generated

Calcium sulfite % FGD solids generated

Other, explain:  % FGD solids generated

Other, explain:  % FGD solids generated

**CBI?**

Yes

**B4-14.** Are the *FGD solids* combined with *fly ash*, *bottom ash*, or other material?

Yes (Continue)

No (Skip to Question B4-16)

**CBI?**

Yes

**B4-15.** Is a cementitious/pozzolanic material produced with the FGD solids at the plant?

Yes

No

**CBI?**

Yes

**B4-16.** Indicate the methods of *FGD solids separation* used by the plant for FGD slurry blowdown (or slurry discharge). Refer to Figure B-1 for an example of a FGD solids separation system. Note that FGD solids separation and *FGD solids dewatering* are separate processes. [Check all boxes that apply.]

Hydrocyclones

Centrifuge

Thickener

Other, explain:

Blowdown sent directly to a pond system reported in Table D-1 (no FGD solids separation process)

Blowdown sent directly to wastewater treatment system reported in Table D-2 (no FGD solids separation process)

**CBI?**

Yes

**B4-17.** Indicate the method of *FGD solids dewatering* used by the plant for the FGD solids. [Check all boxes that apply.]

Vacuum drum filter

Vacuum belt filter

Gypsum stacking

Other, explain:

**CBI?**

Yes

**B4-18.** Provide the typical, maximum, and minimum chlorides concentration of the FGD solids produced by the FGD system in calendar year 2009. The chlorides concentration should be given on a wet basis (i.e., analysis of the FGD with the moisture content included); however, if the chlorides concentration is not known on a wet basis, provide the dry-basis concentration and note that it is a dry-basis concentration in the comments.

Typical concentration:  ppm

Minimum concentration:  ppm

Maximum concentration:  ppm

**CBI?**

Yes

**B4-19.** What parameters affect the ability of the FGD solids to be marketed, sold and/or given away? [Check all boxes that apply.]

- Chlorides content: [redacted] ppm
- Moisture content: [redacted] %
- Other, specify: [redacted] [redacted] ppm
- None – Industry(ies) to which the FGD solids are marketed has not specified standards for the solids.
- N/A – FGD solids are not marketed, sold, or given away.

Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name  
 FGD System ID: Insert System ID

**Part: B**  
**Section Title:** 4. FGD Solids Disposition and Marketing for Wet FGD Systems

**Instructions:** Throughout this section, you will be required to provide information on *FGD solids* disposition for each *wet FGD system* that the plant operates, reported in Table B-1. This section does not need to be completed for planned systems. Please provide all free response answers in the highlighted yellow areas.

**CBI?**

Yes

**B4-20.** In Table B-4, indicate the ultimate destination of FGD solids from the FGD system and provide the tonnage for each type of storage/handling technique for calendar years 2005, 2007, and 2009. If the FGD solids are stored in an on-site *landfill* or *pond/impoundment*, including those located on non-adjointing property, provide the amount of FGD solids stored permanently and/or temporarily.

For example, a plant may operate a *gypsum stacking* operation using a pond/impoundment, and some amount of FGD solids that are transferred to the pond/impoundment are dewatered and sold for use in wallboard manufacturing. In this case, the amount of FGD solids sold for wallboard manufacturing should be identified in BOTH the "Sent to Pond/Impoundment reported in Table A-4: Stored temporarily" category AND the "Marketed and Sold" category. In this same example, all the FGD solids that are transferred to the pond/impoundment and either left settling at the bottom of the pond/impoundment or used to increase the banks of the pond/impoundment should be identified as "Sent to Pond/Impoundment reported in Table A-4: Stored permanently."

**Table B-4. FGD Solids Disposition for 2005, 2007, and 2009**

Ultimate Destination of FGD Solids		Amount Disposed in 2005 (tons)	Amount Disposed in 2007 (tons)	Amount Disposed in 2009 (tons)
Sent to Landfills reported in Table A-6	Stored permanently			
	Stored temporarily (later hauled off-site/marketed)			
Sent to Pond/Impoundment reported in Table A-4	Stored permanently			
	Stored temporarily (later hauled off-site/marketed)			
Sent to Landfills <u>not</u> reported in Table A-6				
Sent to Pond/Impoundment <u>not</u> reported in Table A-4				
Marketed and sold				
Given away				
Other, explain:				
Other, explain:				

- CBI?**  
 Yes
- B4-21.** Complete Table B-5 if the plant markets, sells, and/or gives away the FGD solids from this FGD system. For each destination, provide the tons of FGD solids for which the FGD solids are marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the FGD solids for each destination.

**Table B-5. FGD Solids Marketed/Sold in 2005, 2007, and 2009**

Destination	2005		2007		2009	
	Tons	Gross Revenue Generated (\$)	Tons	Gross Revenue Generated (\$)	Tons	Gross Revenue Generated (\$)
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						

- CBI?**  
 Yes
- B4-22.** In Table B-6, provide the total cost incurred to remove or dispose of FGD solids from 2005 to 2009 including the cost for labor, materials, transportation, and energy. Also provide the cost by component. Include other components not provided in the list of processes in the yellow box provided.

**Table B-6. Cost Incurred to Remove or Dispose of FGD Solids in 2005, 2007, and 2009**

Process	2005	2007	2009
	Total Costs Incurred	Total Costs Incurred	Total Costs Incurred
Solids separation	\$	\$	\$
Solids dewatering	\$	\$	\$
Hauling FGD solids	\$	\$	\$
Cost of on site disposal	\$	\$	\$
Cost of off site disposal	\$	\$	\$
Other:	\$	\$	\$
Other:	\$	\$	\$
Other:	\$	\$	\$
<b>Total</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>



Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name

**Part: B**  
**Section Title: 5. FGD Wastewater Generation**

**Instructions:** Throughout this section, you will be required to provide information for all *wet FGD systems* that the plant operates, reported in Table B-1. This section does not need to be completed for planned systems. Please provide all free response answers in the highlighted yellow areas.

**CBI?**  
 Yes

**B5-1.** In Table B-7, provide information for each wet FGD system that the plant operates reported in Table B-1. For the source of FGD reagent preparation water, absorber make-up water, and mist eliminator wash water, you may enter more than one source. Select a source from the dropdown menu. For the percent contribution of the flow rates, provide the percentage based on the total flow rate for all these sources entering the FGD system.

**Table B-7. FGD System Water Sources and Flow Rates**

FGD System ID	FGD Reagent Preparation Water, Absorber Make-Up Water, and Mist Eliminator Wash Water (Sources, Percent Contribution, and Flow Rate)		
	Source(s)	Percent	Flow Rate (gpd)
<i>Example:</i>	<i>FGDB</i>	<i>80%</i>	<i>48,000</i>
	<i>CTB</i>	<i>20%</i>	<i>12,000</i>
FGD-1	<i>Other</i>		
FGD System ID (no pl)	FGD System Water Source		
	FGD System Water Source		
	FGD System Water Source		
	Other		
FGD System ID (no pl)	FGD System Water Source		
	FGD System Water Source		
	FGD System Water Source		
	Other		
FGD System ID (no pl)	FGD System Water Source		
	FGD System Water Source		
	FGD System Water Source		
	Other		
FGD System ID (no pl)	FGD System Water Source		
	FGD System Water Source		
	FGD System Water Source		
	Other		
FGD System ID (no pl)	FGD System Water Source		
	FGD System Water Source		
	FGD System Water Source		
	Other		

**CBI?**

Yes

**B5-2.** In Table B-8, provide information for each wet FGD system that the plant operates reported in Table B-1.

**Table B-8. Water Generated from Wet FGD Systems**

FGD System ID	Absorber Type	Typical FGD Slurry Blowdown (or Slurry Discharge) Flow Rate Exiting the Absorber (gpd)	Typical Range of Percent Solids of FGD Slurry Blowdown (or Slurry Discharge) Exiting the Absorber (%)	Typical Amount of Solids Separation Recycle Returned to Absorber (gpd)	Typical Amount of FGD Scrubber Purge (or Slurry Discharge) Sent to Wastewater Treatment or Discharge (gpm AND gpd)	Typical Duration AND Frequency of FGD Scrubber Purge (or Slurry Discharge) Generation (hpd AND dpy)
<b>Example:</b> FGD-1	Recirculation	240,000	12 to 16	180,000	200 gpm 120,000 gpd	10 hpd 365 dpy
FGD System ID (no pl)	Recirculation/Single Pass				gpm gpd	hpd dpy
FGD System ID (no pl)	Recirculation/Single Pass				gpm gpd	hpd dpy
FGD System ID (no pl)	Recirculation/Single Pass				gpm gpd	hpd dpy
FGD System ID (no pl)	Recirculation/Single Pass				gpm gpd	hpd dpy
FGD System ID (no pl)	Recirculation/Single Pass				gpm gpd	hpd dpy
FGD System ID (no pl)	Recirculation/Single Pass				gpm gpd	hpd dpy

**CBI?**

Yes

**B5-3.** Provide the typical chlorides and solids concentrations of the untreated *FGD scrubber purge (or slurry discharge)* transferred to the *wastewater treatment system (after the FGD solids separation process, but prior to commingling with other process wastewater)*.

- Chlorides content: \_\_\_\_\_ ppm
- Total suspended solids (TSS): \_\_\_\_\_ ppm

Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name

**Part: B**  
**Section Title:** 6. FGD Monitoring Data Instructions

**Instructions:** Throughout this section, you will be required to provide monitoring data for all *wet FGD systems* that the plant operates, reported in Table B-1. This section does not need to be completed for planned systems. Please provide all free response answers in the highlighted yellow areas.

**CBI?**

Yes

**B6-1.** Has your plant collected monitoring data (for any reason) for untreated *FGD scrubber purge* (or *slurry discharge*) in the 12 months prior to receiving the ICR for any of the following analytes:

- Metals (including monitoring data for total recoverable or dissolved metals analyses, or trace metals analyses);
- Ammonia;
- Nitrate/nitrite;
- Total Kjeldahl nitrogen (TKN); and
- Total cyanide.

**Note:** The untreated FGD scrubber purge (or slurry discharge) stream is the *FGD wastewater* stream leaving the solids separation process prior to commingling with other water streams (see Figures B-1 and B-2).

Yes (Provide the monitoring data as instructed below)

No ([Skip to Section 7](#))

**Note:** You are not required to perform non-routine tests or measurements solely for the purpose of responding to this question.

Provide the monitoring data in Table B-9 in the tab labeled "Part B Section 6 Table" for each different FGD scrubber purge stream for which the plant collected monitoring data. Report all results. Identify results that are less than the method detection limit (MDL), and results that are between the detection and reporting limits. For example, if the MDL is equal to 5 ng/L, the reporting limit is equal to 15 ng/L, and the value reported by the laboratory is 12 ng/L, report 12 ng/L as the measured value and identify and describe any qualifiers on the data in the corresponding column. Copy Table B-9 as many times as needed using the "Copy Table B-9" button below.

**Copy Table B-9**

Note: If you operate multiple *FGD solids separation* processes (e.g., two sets of hydroclones), only provide monitoring data collected after the last solid separation process. If necessary, you may provide additional information regarding the sample collection techniques or analytical methods in the Comments section (e.g., sample collection followed EPA Method 1669 protocols, dynamic reaction cell was used in conjunction with analytical method).

The following information should be provided for each data point:

- Name of analyte and CAS Number;
- Measured value, including those reported below the laboratory reporting limit, including units (if not detected, list the *detection limit* value and select the less than (<) symbol in the non-detect indicator column);
- Analytical method used;
- Sample-specific detection limit for the method used;
- Sample-specific nominal quantitation limit stipulated for the method used;
- Date the sample was collected;
- Location where the sample was collected (e.g., purge tank which collects secondary hydroclone overflow);
- Whether the sample was collected as a grab or as a composite (and note the compositing period used);
- Description of any qualifiers for the measurement;
- For metals, whether the sample was analyzed as total recoverable or dissolved;
- Identification of FGD system(s) and steam electric generating unit(s) that the sample represents (report FGD System IDs and associated steam electric generating units from Table B-1); and
- Flow rate (only if flow rate data were recorded at the sampling point during the sampling period).





Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name

**Part: B**  
**Section Title: 7. FGD Wastewater Treatment**

**Instructions:** Throughout this section, you will be required to provide information for all *wet FGD systems* that the plant operates, reported in Table B-1. This section does not need to be completed for planned systems. Please provide all free response answers in the highlighted yellow areas.

**CBI?**

Yes

**B7-1.** Does the plant transfer the *FGD scrubber purge (or slurry discharge)* to a *settling pond*?

- Yes (Continue)  
 No (Skip to Question B7-4)

**CBI?**

Yes

**B7-2.** Indicate which *process wastewaters* are commingled with the FGD scrubber purge (or slurry discharge) in the settling pond. [Check all boxes that apply.]

- |   |   |
|---|---|
| <input type="checkbox"/> Fly ash sludge       | <input type="checkbox"/> Bottom ash sludge  |
| <input type="checkbox"/> Metal cleaning waste | <input type="checkbox"/> Boiler blowdown  |
| <input type="checkbox"/> Mill reject sludge   | <input type="checkbox"/> Other, explain: <span style="background-color: yellow; display: inline-block; width: 150px; height: 15px;"></span> |
| <input type="checkbox"/> None                 | <input type="checkbox"/> Other, explain: <span style="background-color: yellow; display: inline-block; width: 150px; height: 15px;"></span> |

**CBI?**

Yes

**B7-3.** If the FGD scrubber purge (or slurry discharge) is commingled with *bottom ash* or *fly ash sludge* water in the pond(s), select the option below that best describes the configuration of the pond(s). If neither option applies, provide an explanation in the space provided:

- "True" commingling: FGD scrubber purge (or slurry discharge) and bottom ash and/or fly ash sludge water are combined in one pond dedicated to the treatment of both waters
- FGD scrubber purge (or slurry discharge) is treated in a FGD pond and subsequently commingled with ash water in a dedicated ash pond
- FGD scrubber purge (or slurry discharge) is not commingled with other wastewaters
- FGD scrubber purge (or slurry discharge) wastewater is treated using a wastewater treatment system other than a settling pond and subsequently commingled with ash water in a dedicated ash pond
- Other, explain:

**CBI?** **B7-4.** Indicate wastewater treatment technologies used to treat the FGD scrubber purge (or slurry discharge). [Check all boxes that apply.]

Yes

- Settling pond
- Biological reactor – aerobic
- Mechanical vapor compression (brine concentrator)
- Mechanical vapor compression (brine concentrator) with spray dryer
- Mechanical vapor compression (brine concentrator) with crystallizer
- Other, explain:
- Chemical precipitation
- Biological reactor – anoxic/anaerobic
- Constructed wetlands

**CBI?** **B7-5.** Indicate all intermediate and final destination(s) of the *treated* FGD scrubber purge (or slurry discharge). If the plant recycles the treated FGD scrubber purge (or slurry discharge), indicate the plant process to which this water is recycled. [Check all that apply].

Yes

Immediately recycled back to plant process. Please describe how the treated FGD scrubber purge (or slurry discharge) is reused:

Discharged to surface water. Provide NPDES permitted outfall number (from Part A Section 2.2):

Indirect discharge to a publicly or privately owned treatment works

Deep well injection

Other, explain:

**CBI?** **B7-6.** Plants that produce gypsum from wet FGD systems may generate water from the storage and handling of gypsum. Examples of gypsum-related waters are *gypsum wash water* and *gypsum pile runoff*. Are gypsum-related waters generated at the plant? Note: gypsum-related water does not include *FGD slurry blowdown* or FGD scrubber purge (or slurry discharge).

Yes

Yes (Continue)

No (Skip to Section 8)

If yes, provide the typical volume of gypsum-related waters generated per day (gpd) and the frequency of water generation (dpy) for calendar year 2009.

gpd

dpy



**CBI?**

Yes

**B7-7.** Indicate how the gypsum-related waters are handled. [Check all boxes that apply.]

Reused in FGD process

Reused in other process operations. Please describe how the gypsum-related waters are reused:

[Redacted]

Transferred to treatment system reported in Tables D-1 or D-2. Identify the type of treatment system below. [Check all that apply.]

Settling pond

Biological reactor – aerobic

Mechanical vapor compression (brine concentrator)

Mechanical vapor compression (brine concentrator) with spray dryer

Mechanical vapor compression (brine concentrator) with crystallizer

Other, explain:

[Redacted]

Chemical precipitation

Biological reactor – anoxic/anaerobic

Constructed wetlands

Discharged to surface water. Provide NPDES permitted outfall number (from Part A Section 2.2):

[Redacted]

Indirect discharge to a publicly or privately owned treatment works

Other, explain:

[Redacted]

Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name  
 FGD System ID: Insert System ID

**Part: B**  
**Section Title: 8. Dry FGD System Information**

**Instructions:** Throughout this section, you will be required to provide information for each *dry FGD system* that the plant operates, reported in Table B-1. This section does not need to be completed for planned systems. Please provide all free response answers in the highlighted yellow areas.

**Make copies of Section 8 and Section 8 tables for each dry FGD system previously defined in Table B-1 using the Copy Section 8 and Section 8 Tables button below. Please note that you will create two new tabs for these sections. You may delete unneeded tabs, if accidentally created. Enter the FGD system ID in the space provided above (use FGD system IDs assigned in Table B-1).**

**CBI?**

Yes

**B8-1.** Did you report use of a dry FGD system in Table B-1?

- Yes (Continue)  
 No (Skip to next Questionnaire Part)

**Copy Section 8 and Section 8 Tables**

**CBI?**

Yes

**B8-2.** Indicate how the *FGD solid* is removed from the flue gas.

- ESP  
 Fabric filter  
 Other, specify

**CBI?**

Yes

**B8-3.** Is the FGD system located upstream or downstream of the *fly ash* collection system?

Upstream of fly ash collection

Downstream of fly ash collection

**CBI?**

Yes

**B8-4.** For water sources that may be used as a source of FGD reagent preparation water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and maximum solids percentage that is acceptable for the water to be used for those purposes. Identify any other criteria that the source water must meet.

Chlorides concentration: \_\_\_\_\_ ppm

Solids percentage: \_\_\_\_\_ %

Other, explain: \_\_\_\_\_

**CBI?**

Yes

**B8-5.** Provide the flow rate, duration, and frequency of the FGD reagent preparation water for the FGD system for calendar year 2009.

\_\_\_\_\_ gpm

\_\_\_\_\_ hpd

\_\_\_\_\_ dpy

**CBI?**

Yes

**B8-6.** Provide the source of the FGD reagent preparation water used. [Check all boxes that apply.]

Raw intake water

Intake water that has been treated on site prior to use

Process wastewater, specify \_\_\_\_\_ Process Wastewater

Other, explain: \_\_\_\_\_

\_\_\_\_\_

**CBI?**

Yes

**B8-7.** Is any *FGD wastewater* generated from the operation of the dry FGD scrubber?

Yes (Continue)

No (Skip to Question B8-9)

**CBI?**

Yes

**B8-8.** Indicate all intermediate and final destination(s) of the FGD wastewater. If the plant recycles the FGD wastewater, indicate the plant process to which this water is recycled. [Check all that apply].

Immediately recycled back to plant process. Please describe how the FGD wastewater is reused:

[Redacted]

Transferred to treatment system reported in Tables D-1 or D-2. Identify the type of treatment system below. [Check all boxes that apply.]

- Settling pond
- Biological reactor – aerobic
- Mechanical vapor compression (brine concentrator)
- Mechanical vapor compression (brine concentrator) with spray dryer
- Mechanical vapor compression (brine concentrator) with crystallizer
- Other, explain: [Redacted]
- Chemical precipitation
- Biological reactor – anoxic/anaerobic
- Constructed wetlands

Discharged to surface water. Provide NPDES permitted outfall number (from Part A Section 2.2):

[Redacted]

Indirect discharge to a publicly or privately owned treatment works

Deep well injection

Other, explain:

[Redacted]

**CBI?**

Yes

**B8-9.** Is any FGD wastewater generated from cleaning the dry FGD scrubber (e.g., power washing during *scheduled* generating unit outages)?

Yes (Continue)

No (Skip to Question B8-11)

Provide the volume and frequency of wastewater generated from the dry FGD scrubber in 2009.

[Redacted] gpd over [Redacted] days

**CBI?**

Yes

**B8-10.** Indicate all intermediate and final destination(s) of the FGD wastewater from cleaning. If the plant recycles the FGD wastewater from cleaning, indicate the plant process to which this water is recycled. [Check all that apply].

Immediately recycled back to plant process. Please describe how the FGD wastewater is reused:

[Redacted]

Transferred to treatment system reported in Tables D-1 or D-2. Identify the type of treatment system below. [Check all boxes that apply.]

Settling pond

Chemical precipitation

Biological reactor – aerobic

Biological reactor – anoxic/anaerobic

Mechanical vapor compression (brine concentrator)

Constructed wetlands

Mechanical vapor compression (brine concentrator) with spray dryer

Mechanical vapor compression (brine concentrator) with crystallizer

Other, explain:

[Redacted]

Discharged to surface water. Provide NPDES permitted outfall number (from Part A Section 2.2):

[Redacted]

Indirect discharge to a publicly or privately owned treatment works

Deep well injection

Other, explain:

[Redacted]

**CBI?**

Yes

**B8-11.** What parameters affect the ability of the FGD solids to be marketed, sold and/or given away? [Check all boxes that apply.]

Chlorides content:

[Redacted] ppm

Moisture content:

[Redacted] ppm

Other, specify:

[Redacted]

[Redacted] ppm

None – Industry(ies) to which the FGD solids are marketed has not specified standards for the solids.

N/A – FGD solids are not marketed, sold, or given away.

Plant ID: Insert Plant ID  
 Plant Name: Insert Plant Name  
 FGD System ID: Insert System ID

**Part: B**  
**Section Title:** 8. FGD Solids Disposition and Marketing for Dry FGD Systems

**Instructions:** Throughout this section, you will be required to provide information on *FGD solids* disposition for all *dry FGD systems* that the plant operates reported in Table B-1. This section does not need to be completed for planned systems. Please provide all free response answers in the highlighted yellow areas.

**CBI?**  
 Yes

**B8-12.** In Table B-10, indicate the ultimate destination of FGD solids from the FGD system and provide the tonnage for each type of storage/handling technique for calendar years 2005, 2007, and 2009. If the FGD solids are stored in a *landfill* or *pond/impoundment*, provide the amount of FGD solids stored permanently and/or temporarily.

For example, a plant may operate a gypsum landfill, and some amount of FGD solids that are transferred to the landfill may later be removed from the landfill and sold for use in wallboard manufacturing. In this case, the amount of FGD solids sold for wallboard manufacturing should be identified in BOTH the "Landfills reported in Table A-6: Stored temporarily" category AND the "Marketed and Sold" category. In this same example, all the FGD solids that are transferred to the landfill and left in the landfill should be identified as "Landfills reported in Table A-6: Stored permanently."

**Table B-10. FGD Solids Disposition for 2005, 2007, and 2009**

Ultimate Destination of FGD Solids		Amount Disposed in 2005 (tons)	Amount Disposed in 2007 (tons)	Amount Disposed in 2009 (tons)
Sent to Landfills reported in Table A-6	Stored permanently			
	Stored temporarily (later hauled off-site/marketed)			
Sent to Pond/Impoundment reported in Table A-4	Stored permanently			
	Stored temporarily (later hauled off-site/marketed)			
Sent to Landfills <u>not</u> reported in Table A-6				
Sent to Pond/Impoundment <u>not</u> reported in Table A-4				
Marketed and sold				
Given away				
Other, explain:				
Other, explain:				

**CBI?**

Yes

**B8-13.** Complete Table B-11 if the plant markets, sells, and/or gives away the FGD solids from this FGD system. For each destination, provide the tons of FGD solids for which the FGD solids are marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the FGD solids for each destination.

**Table B-11. FGD Solids Marketed/Sold in 2005, 2007, and 2009**

Destination	2005		2007		2009	
	Tons	Gross Revenue Generated (\$)	Tons	Gross Revenue Generated (\$)	Tons	Gross Revenue Generated (\$)
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						
FGD Solids Marketing						

**CBI?**

Yes

**B8-14.** In Table B-12, provide the total cost incurred to remove or dispose of FGD solids from 2005 to 2009 including the cost for labor, materials, transportation, and energy. Also provide the cost by component. Include other components not provided in the list of processes in the yellow box provided.

**Table B-12. Cost Incurred to Remove or Dispose of FGD Solids**

Process	2005		2007		2009	
	Total Costs Incurred	Total Costs Incurred	Total Costs Incurred	Total Costs Incurred	Total Costs Incurred	Total Costs Incurred
Solids separation	\$		\$		\$	
Solids dewatering	\$		\$		\$	
Hauling FGD solids	\$		\$		\$	
Cost of on site disposal	\$		\$		\$	
Cost of off site disposal	\$		\$		\$	
Other:	\$		\$		\$	
Other:	\$		\$		\$	
Other:	\$		\$		\$	
<b>Total</b>	<b>\$</b>		<b>\$</b>		<b>\$</b>	

Plant Name: Insert Plant ID  
 Plant ID: Insert Plant Name

**Part: B**  
**Section Title:** Part B Comments

**Instructions:** Cross reference your comments by question number and indicate the confidential status of your comment by checking the box next to "Yes" under "CBI?" (Confidential Business Information).

Question Number	Comment
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	
CBI? <input type="checkbox"/> Yes	



<b>CBI?</b> <input type="checkbox"/> Yes		
<b>CBI?</b> <input type="checkbox"/> Yes		
<b>CBI?</b> <input type="checkbox"/> Yes		
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<b>CBI?</b> <input type="checkbox"/> Yes		
<b>CBI?</b> <input type="checkbox"/> Yes		
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<b>CBI?</b> <input type="checkbox"/> Yes		
<b>CBI?</b> <input type="checkbox"/> Yes		
<b>CBI?</b> <input type="checkbox"/> Yes		
<b>CBI?</b> <input type="checkbox"/> Yes		

**Steam Electric Questionnaire Code Tables**

<b>Process Wastewaters</b>	
<i>For Use in Tables and Questions throughout Parts A, B, C, D, and F.</i>	
Air heater cleaning water	AHCW
Ash pile runoff	APR
Boiler blowdown	BB
Boiler fireside cleaning water	BFCW
Boiler tube cleaning water	BTCW
Bottom ash sluice	BAS
Carbon capture wastewater	CCAPW
Coal pile runoff	CPR
Combined ash sluice	CAS
Combustion turbine cleaning (combustion gas portion of turbine) water	COMBCW
Combustion turbine cleaning (compressor portion of the turbine) water	COMPRCW
Combustion turbine evaporative coolers blowdown	TECB
Cooling tower blowdown	CTB
FGD scrubber purge	SCRBP
FGD slurry blowdown	FGDB
Filter Backwash	FLTBW
Floor drain wastewater	FDW
Flue gas mercury control system wastewater	FGMCW
Fly ash sluice	FAS
General runoff	GR
Gypsum pile runoff	GPR
Gypsum wash water	GYPWW
Ion exchange wastewater	IXW
Landfill runoff - capped landfill	LRC
Landfill runoff - uncapped landfill	LRUC
Leachate	LEACH
Limestone pile runoff	LPR
Mill reject sluice	MRS

<b>Treated Wastewaters</b>	
<i>For Use as Effluents from Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-4.</i>	
Effluent - 1	EFF-1
Effluent - 2	EFF-2
Effluent - 3	EFF-3
Effluent - 4	EFF-4
Effluent - 5	EFF-5
Effluent - 6	EFF-6
Filter backwash	FitBW
Sludge	SLDG
<i>For Use as Influent to Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-3, AND Recycled Waters Throughout Questionnaire.</i>	
POND-1 Effluent	POND-1-EFF
POND-2 Effluent	POND-2-EFF
POND-3 Effluent	POND-3-EFF
POND-4 Effluent	POND-4-EFF
POND-5 Effluent	POND-5-EFF
POND-6 Effluent	POND-6-EFF
POND-7 Effluent	POND-7-EFF
POND-8 Effluent	POND-8-EFF
POND-9 Effluent	POND-9-EFF
POND-10 Effluent	POND-10-EFF
POND-A Effluent	POND-A-EFF
POND-B Effluent	POND-B-EFF
POND-C Effluent	POND-C-EFF
WWT-1 Effluent	WWT-1-EFF
WWT-2 Effluent	WWT-2-EFF
WWT-3 Effluent	WWT-3-EFF
WWT-4 Effluent	WWT-4-EFF
WWT-5 Effluent	WWT-5-EFF

**Steam Electric Questionnaire Code Tables**

<b>Process Wastewaters</b>	
<i>For Use in Tables and Questions throughout Parts A, B, C, D, and F.</i>	
Once -through cooling water	CW
Reverse osmosis reject water	RORW
SCR catalyst regeneration wastewater	SCRRW
SCR catalyst washing wastewater	SCRWW
Soot blowing wash water	SOOTW
Steam turbine cleaning water	STCW
Yard drain wastewater	YARDW

<b>Treated Wastewaters</b>	
<i>For Use as Influent to Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-3, AND Recycled Waters Throughout Questionnaire.</i>	
WWT-6 Effluent	WWT-6-EFF
WWT-A Effluent	WWT-A-EFF
WWT-B Effluent	WWT-B-EFF
WWT-C Effluent	WWT-C-EFF

**Steam Electric Questionnaire Code Tables**

<b>Wastewater Treatment Units</b>	
<i>For Use in Tables and Questions Throughout Parts D and F.</i>	
Adsorptive media	ADSORB
Aerobic Biological Reactor	AERBIO
Anaerobic Biological Reactor	ANBIO
Aerobic/Anaerobic Biological Reactor	AER/ANBIO
Chemical Precipitation Reaction Tank 1 - 1	CP-1-1
Chemical Precipitation Reaction Tank 1 - 2	CP-1-2
Chemical Precipitation Reaction Tank 2 - 1	CP-2-1
Chemical Precipitation Reaction Tank 2 - 2	CP-2-2
Chemical Precipitation Reaction Tank 3 - 1	CP-3-1
Chemical Precipitation Reaction Tank 3 - 2	CP-3-2
Clarification, Primary - 1	CL-P-1
Clarification, Primary - 2	CL-P-2
Clarification, Secondary - 1	CL-S-1
Clarification, Secondary - 2	CL-S-2
Clarification, Tertiary - 1	CL-T-1
Clarification, Tertiary - 2	CL-T-2
Constructed wetland - Cell 1	CWL -1
Constructed wetland - Cell 2	CWL -2
Constructed wetland - Cell 3	CWL -3
Constructed wetland - Cell 4	CWL -4
Constructed wetland - Cell 5	CWL -5
Constructed wetland - Cell 6	CWL -6
Constructed wetland system	CWTS
Equalization, Primary	EQ-P
Equalization, Secondary	EQ-S
Filter, Microfiltration - 1	FLT-M-1
Filter, Microfiltration - 2	FLT-M-2

<b>Destinations</b>	
<i>For Use in Tables and Questions Throughout Parts A, C, D, and F.</i>	
Burned on site	BURN
Deep-well injection	DWELL
Discharge to POTW	POTW
Discharge to PrOTW	PrOTW
Discharge to surface water	SW
Evaporation	EVAP
Hauled off site for reuse (removal fee)	HAULR - RF
Hauled off site for reuse (given away)	HAULR - GA
Hauled off site for reuse (marketed and sold)	SOLD
Hauled off site for disposal	HAUL
Mixed with fly ash for disposal	MFA
On-site landfill (as reported in Table A-6)	LANDF
POND-1	POND-1
POND-2	POND-2
POND-3	POND-3
POND-4	POND-4
POND-5	POND-5
POND-6	POND-6
POND-7	POND-7
POND-8	POND-8
POND-9	POND-9
POND-10	POND-10
POND-A	POND-A
POND-B	POND-B
POND-C	POND-C
WWT-1	WWT-1
WWT-2	WWT-2

**Steam Electric Questionnaire Code Tables**

<b>Wastewater Treatment Units</b>	
<i>For Use in Tables and Questions Throughout Parts D and F.</i>	
Filter, Microfiltration - 3	FLT-M-3
Filter, Microfiltration - 4	FLT-M-4
Filter, Sand/Gravity - 1	FLT-S-1
Filter, Sand/Gravity - 2	FLT-S-2
Filter, Sand/Gravity - 3	FLT-S-3
Filter, Sand/Gravity - 4	FLT-S-4
Filter, Ultrafiltration - 1	FLT-U-1
Filter, Ultrafiltration - 2	FLT-U-2
Filter, Ultrafiltration - 3	FLT-U-3
Filter, Ultrafiltration - 4	FLT-U-4
Filter press - 1	FP-1
Filter press - 2	FP-2
Holding tank	HT
Ion exchange	IX
Natural wetlands	NW
pH adjustment - 1	PH-1
pH adjustment - 2	PH-2
pH adjustment - 3	PH-3
Reverse osmosis	ROS
Pond Unit - 1	SPD-1
Pond Unit - 2	SPD-2
Pond Unit - 3	SPD-3
Pond Unit - 4	SPD-4
Pond Unit - 5	SPD-5
Pond Unit - 6	SPD-6
Pond Unit - 7	SPD-7
Pond Unit - 8	SPD-8
Pond Unit - 9	SPD-9

<b>Destinations</b>	
<i>For Use in Tables and Questions Throughout Parts A, C, D, and F.</i>	
WWT-3	WWT-3
WWT-4	WWT-4
WWT-5	WWT-5
WWT-6	WWT-6
WWT-A	WWT-A
WWT-B	WWT-B
WWT-C	WWT-C
Reuse as boiler water	RECYC - BW
Reuse as bottom ash sluice	RECYC - BAS
Reuse as combined ash sluice	RECYC - CAS
Reuse as FGD slurry preparation water	RECYC - FGDP
Reuse as FGD absorber makeup	RECYC - FGDAB
Reuse as fly ash sluice	RECYC - FAS
Reuse as mill reject sluice	RECYC - MRS
Reuse in cooling towers	RECYC - CW

**Steam Electric Questionnaire Code Tables**

<b>Wastewater Treatment Units</b>	
<i>For Use in Tables and Questions Throughout Parts D and F.</i>	
Pond Unit - 10	SPD-10
Pond Unit - 11	SPD-11
Pond Unit - 12	SPD-12
Pond Unit - 13	SPD-13
Pond Unit - 14	SPD-14
Settling tank - 1	ST-1
Settling tank - 2	ST-2
Settling tank - 3	ST-3
Settling tank - 4	ST-4
Settling tank - 5	ST-5
Thickener - 1	TH-1
Thickener - 2	TH-2
Vacuum drum filter - 1	VF-1
Vacuum drum filter - 2	VF-2
Vacuum filter belt - 1	VFB-1
Vacuum filter belt - 2	VFB-2

<b>Solids Handling</b>	
<i>For Use as Planned Solids Handling for the FGD Slurry Blowdown in Part B Table B-2.</i>	
Centrifuge - 1	CENT-1
Centrifuge - 2	CENT-2
Centrifuge - 3	CENT-3
Centrifuge - 4	CENT-4
Hydrocyclones - 1	HYC-1
Hydrocyclones - 2	HYC-2
Hydrocyclones - 3	HYC-3
Hydrocyclones - 4	HYC-4
Filter press - 1	FP-1
Filter press - 2	FP-2
Thickener - 1	TH-1
Thickener - 2	TH-2
Vacuum drum filter - 1	VF-1
Vacuum drum filter - 2	VF-2
Vacuum filter belt - 1	VFB-1
Vacuum filter belt - 2	VFB-2

**Part B Drop Downs**

Yes/No
Yes/No
Select
No
Yes

Recirculation/Single Pass
Recirculation/Single Pass
Select
Recirculation
Single Pass

FGD System ID
FGD System ID
Select
FGD-1
FGD-2
FGD-3
FGD-4
FGD-5
FGD-6
FGD-A
FGD-B
FGD-C

FGD System Water Source
FGD System Water Source
Select
Air heater cleaning water
Ash pile runoff
Boiler blowdown
Boiler fireside cleaning water
Boiler tube cleaning water
Bottom ash sluice
Carbon capture wastewater
Coal pile runoff
Combined ash sluice
Combustion turbine cleaning (combustion gas portion of turbine) water
Combustion turbine cleaning (compressor portion of the turbine) water
Combustion turbine evaporative coolers blowdown
Cooling tower blowdown
FGD scrubber purge (or slurry discharge)
FGD slurry blowdown
Filter Backwash
Floor drain wastewater
Flue gas mercury control system wastewater
Fly ash sluice
General runoff
Gypsum pile runoff
Gypsum wash water
Ion exchange wastewater
Landfill runoff - capped landfill
Landfill runoff - uncapped landfill
Leachate
Limestone pile runoff
Mill reject sluice
Once -through cooling water
Raw intake water
Raw intake water as makeup
Reverse osmosis reject water
SCR catalyst regeneration wastewater
SCR catalyst washing wastewater
Soot blowing wash water
Steam turbine cleaning water
Treated intake water
Treated intake water as makeup
Yard drain wastewater

Process Wastewater
Process Wastewater
Select
Air heater cleaning water
Ash pile runoff
Boiler blowdown
Boiler fireside cleaning water
Boiler tube cleaning water
Bottom ash sluice
Carbon capture wastewater
Coal pile runoff
Combined ash sluice
Combustion turbine cleaning (combustion gas portion of turbine) water
Combustion turbine cleaning (compressor portion of the turbine) water
Combustion turbine evaporative coolers blowdown
Cooling tower blowdown
FGD scrubber purge (or slurry discharge)
FGD slurry blowdown
Filter Backwash
Floor drain wastewater
Flue gas mercury control system wastewater
Fly ash sluice
General runoff
Gypsum pile runoff
Gypsum wash water
Ion exchange wastewater
Landfill runoff - capped landfill
Landfill runoff - uncapped landfill
Leachate
Limestone pile runoff
Mill reject sluice
Once -through cooling water
Reverse osmosis reject water
SCR catalyst regeneration wastewater
SCR catalyst washing wastewater
Soot blowing wash water
Steam turbine cleaning water
Yard drain wastewater
Other (specify to the right)

FGD Solids Marketing
FGD Solids Marketing
Select
Agriculture
Blended cement/raw feed for clinker
Concrete/concrete products
Flowable fill
Gypsum panel products (not wallboard)
Mining applications
Soil modification/stabilization
Structural fills/embankments
Wallboard manufacturing
Waste stabilization/solidification
Other (specify):

Materials of Construction
Materials of Construction
Select
2205 stainless steel
255 stainless steel
316L stainless steel
317LM stainless steel
317LMN stainless steel
625 stainless steel
Carbon Steel
Ceramic
Duplex Stainless Steel
Fiberglass
Masonry Tile Lined Carbon Steel
Masonry Tile Lined Concrete
Mild Stainless Steel
Nickel Alloy Steel
Nickel Alloy Steel Lined Carbon Steel
Plastic
Plastic Lined Carbon Steel
Rubber Lined Carbon Steel
Rubber Lined Concrete
Super Austenitic Stainless Steel
Other (specify to the right)

Steam Electric Generating Units
Steam Electric Generating Units
Select
SEUnit-1
SEUnit-2
SEUnit-3
SEUnit-4
SEUnit-5
SEUnit-6
SEUnit-7
SEUnit-8
SEUnit-9
SEUnit-10

FGD System ID (no planned)
FGD System ID (no planned)
Select
FGD-1
FGD-2
FGD-3
FGD-4
FGD-5
FGD-6

Type of FGD System
Type of FGD System
Select
Circulating dry scrubber
Jet bubbling reactor
Mechanically aided
Packed
Spray
Spray/Tray
Spray Dryer
Tray
Venturi
Other (specify below)

Type of Sorbent
Type of Sorbent
Select
Lime
Limestone
Magnesium Lime
Magnesium Oxide
Soda Ash
Sodium Hydroxide
Other (specify)
Not Applicable

Grab/Composite
Grab/Composite
Select
Composite
Grab

New/Existing
New/Existing
Select
Existing
New

FGD System ID (Planned)
FGD System ID (Planned)
Select
FGD-A
FGD-B
FGD-C

Total Recoverable/Dissolved
Total Recoverable/Dissolved
Select
Dissolved
Total Recoverable
N/A
Units
Units
Select
mg/L
ug/L
ng/L
Non Detect Indicators
Non Detect indicators
Select
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