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

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

Steam Electric Questionnaire

PART C - ASH HANDLING

Table of Contents

Approved: May XX, 2010

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

PART C. ASH HANDLING

INSTRUCTIONS

Part C requests information about ash handling operations at your plant. Complete Part C if ash is generated in any fossil-fueled steam electric generating units at your plant. See Part A Section 8 for steam electric generating unit fuel classifications.

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

Please provide all free response answers in the highlighted yellow areas. Throughout Part C, you may need to make copies of certain sections/questions. Instructions are provided throughout Part C regarding making copies. Note that Steam Electric Unit IDs or Storage IDs 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 steam electric unit or ash handling system.

Where the questionnaire indicates to provide an attachment, an electronic format (e.g., PDF) is preferred; however, hardcopies are also acceptable.

Use the Part C Comments tab to do the following: provide additional information as requested in certain questions within Part C; 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.

Refer to the following definitions throughout Part C:

"Fly ash collection" is the separation of fly ash from the flue gas. Examples of fly ash collection equipment include ESPs and baghouses. Fly ash may also be collected by wet scrubbers.

"Fly ash conveyance" is the conveyance of fly ash from the fly ash collection equipment (ESP or baghouse) of one or more generating units to intermediate or final storage (e.g., storage silos or ponds/impoundments). Common dry fly ash conveyance components include filter/separators, vacuum/pressure transfer stations, high pressure blowers, and associated high pressure piping (note that conveyance does NOT include the storage/loading silos). Wet fly ash conveyance equipment is used to sluice fly ash and pump it to wet ash storage (e.g., ash ponds/impoundments).

"Bottom ash conveyance" is the conveyance of bottom ash from the boiler(s) of one or more generating units to the intermediate or final storage of the bottom ash. Dry bottom ash conveyance does not use water to convey bottom ash to intermediate/final storage. Dry bottom ash conveyance includes systems that collect and convey the bottom ash without any use of water, as well as systems in which bottom ash is conveyed mechanically or pneumatically away from a quench water bath (e.g., submerged chain conveyor systems). Wet bottom ash conveyance uses water (i.e., a sluice) to convey bottom ash away from the boiler to intermediate/final storage (e.g., ponds/impoundments). Note that dewatering bins are considered part of bottom ash conveyance.

"Intermediate storage" refers to a facility or site where collected fly ash or bottom ash is stored after conveyance and prior to being transported to final disposal. Dry fly ash intermediate storage typically consists of storage silos. Dry bottom ash intermediate storage typically consists of stackout piles for the bottom ash collected from mechanical drag systems. Wet fly ash or bottom ash intermediate storage typically consists of ponds/impoundments.

"Ash transport/disposal" refers to the transportation of ash from intermediate storage to final disposal. Examples of ash transport/disposal include transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically consists of roads and vehicles that are used to transport the ash.

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

Part: C
Section Title: 1. Ash Generation

CBI? ☐ Yes

C1-1. Is ash generated in any fossil-fueled steam electric generating units at the plant? See Part A Section 8 for steam electric generating unit fuel classifications.

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

CBI? ☐ Yes

C1-2. In Table C-1, indicate the total acreage of the *plant* for each of the following categories, including all contiguous and non-adjoining property within 20 miles under the operational control of the plant or operated by the same ultimate parent, and receiving the plant's waste.

Table C-1. Plant Acreage Breakdown

Category	Acreage
Total Plant Area	
Parking lots	
Buildings and Other Developed Areas	
Active/Inactive/Open ash ponds	
Active/Inactive/Open landfills	
Closed ponds/impoundments and landfills	
Unusable land (e.g., wetlands, cooling reservoir) Specify type(s):	
Other:	
Other:	

CBI? ☐ Yes

C1-3. Is fly ash generated in any fossil-fueled steam electric generating units at the plant? See Part A Section 8 for steam electric generating unit fuel classifications.

○ Yes (Continue)
○ No (Skip to Section 3.1)

Plant ID: Insert Plant ID
Plant Name: Insert Plant ID
SE Unit ID: Insert Unit ID

Part: C
Section Title: 2.1. Fly Ash Handling - Generating Unit Level Information

Instructions: Throughout Section 2.1 (Questions C2-1 through C2-24), provide ash handling information for each steam electric generating unit operated at any time in 2009, including units that may have been idle for an extended period of time. Make copies of Section 2.1 for each steam electric generating unit using the "Copy Section 2.1" button below. Enter the steam electric generating Unit ID (use Unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 2.1

CBI?
☐ Yes

C2-1. Provide fly ash handling information in Table C-2, for each steam electric generating unit reported in Table A-8, following these instructions:

- Provide fly ash handling information at the steam electric generating unit level. For the purpose of this questionnaire, more than one type of fly ash handling (e.g., wet sluicing, mechanical system) may be selected for one generating unit. Check all types of fly ash handling that apply to this steam electric generating unit.
- For the "Type of Fly Ash Collection", only mark "Wet scrubber" if it is the ONLY means of collection. **Note: For any fly ash handling systems marked as "Wet scrubber", do NOT complete the remainder of Part C, Section 2 AND proceed to Part C, Section 3.1.**
- Provide the wet conveyed "Typical Amount of Fly Ash Produced in 2009 (Dry weight basis)" as tons of ash produced per day prior to sluicing from this steam electric generating unit.

Table C-2. Fly Ash Handling Systems Operated in 2009 by Generating Unit

Type of Fly Ash Collection	Type of Fly Ash Handling	Typical Amount of Fly Ash Produced in 2009 (Dry weight basis)		Design Ash Handling Rate (Dry weight basis)		Number of Days Ash was Conveyed in 2009		Loss on Ignition of Fly Ash Produced (Provide typical range for 2009)	
		Wet Conveyed	Dry Conveyed	Wet Conveyed	Dry Conveyed	Wet Conveyed	Dry Conveyed	Wet Conveyed	Dry Conveyed
○ ESP(s), dry, hot side ○ ESP(s), dry, cold side ◉ ESP(s), wet ○ Baghouse(s) (fabric filter) ○ Wet scrubber(s) (only) ○ Other:	☑ Wet sluicing (hydraulic) ☐ Wet vacuum system (pneumatic) ☑ Dry vacuum system ☐ Pressure system ☐ Combined vacuum/pressure system ☐ Mechanical system ☐ Other:	*1,500* tpd *165* dpy	*1,500* tpd *200* dpy	*2,000* tpd *365* dpy	*2,000* tpd *365* dpy	*165* days	*200* days	*1* to *2* %	*1* to *2* %
○ ESP(s), dry, hot side ○ ESP(s), dry, cold side ○ ESP(s), wet ○ Baghouse(s) (fabric filter) ○ Wet scrubber(s) (only) ○ Other:	☐ Wet sluicing (hydraulic) ☐ Wet vacuum system (pneumatic) ☐ Dry vacuum system ☐ Pressure system ☐ Combined vacuum/pressure system ☐ Mechanical system ☐ Other:	tpd dpy	tpd dpy	tpd dpy	tpd dpy	days	days	to %	to %

CBI? ☐ Yes

C2-2. Is wet sluicing a type of fly ash handling for this steam electric generating unit?

○ Yes (Continue)

○ No (Skip to Question C2-6)

Provide information for *wet fly ash handling* in Table C-3. For the source of sluice water, you may enter more than one source from the following options:

- "IN" if *raw intake water* is used;
- "IN-Makeup" if raw intake water is only used as makeup;
- "TR" for use of *intake water* that has been *treated* on site prior to use;
- "TR-Makeup" if treated intake water is used only as makeup; and/or
- Process wastewater and/or treated wastewater described in the code tables on the "Code Tables" tab provided at the end of this workbook.

An example is provided in Table C-3 for a plant that uses the effluent from its ash pond (WWT-1, as would be defined in Part A) for fly ash sluicing and also makes up for losses with untreated river water (which is code IN-Makeup as shown above).

Table C-3. Process Wastewater Generated from Wet Fly Ash Handling in 2009

Average Sluice Water Flow Rate (gpd)	Typical Duration AND Frequency of Sluicing (hpd AND dpy)	Source(s) of Sluice Water	Percent Contribution of Source to Sluice Water Flow
EXAMPLE:			
14,400,000 gpd	*24* hpd *365* dpy	WWT-1 Effluent IN-Makeup Sluice Water Source Other:	*90* % *10* % % %
gpd	hpd dpy	Sluice Water Source Sluice Water Source Sluice Water Source Other:	% % % %

CBI? ☐ Yes

C2-3. For water sources that may be used as a source of *fly ash sluice* water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and the maximum solids percentage that is acceptable for the water to be used for those purposes. [Check all boxes that apply.]

☐ Chlorides concentration, less than: ppm

☐ Solids percentage, less than: %

☐ Other: ppm

CBI? ☐ Yes

C2-4. Is any of the wet *fly ash sluice* water immediately recycled (e.g., without treatment such as a pond) back to the plant process?

○ Yes (Continue)

○ No (Skip to Question C2-5)

Describe how the wet *fly ash sluice* is reused:

CBI? ☐ Yes

C2-5. Is any of the wet *fly ash sluice* indirectly discharged to a publicly or privately owned treatment works, either with or without pretreatment?

○ Yes

○ No

CBI? ☐ Yes

C2-6. Is a wet vacuum system (pneumatic) a type of fly ash handling for this steam electric generating unit?

○ Yes (Continue)

○ No (Skip to Question C2-9)

CBI? ☐ Yes

C2-7. Provide the typical volume of the vacuum water of the *wet vacuum system* generated annually (gpy) and the number of days during which this process wastewater is generated.

______ gpy ______ dpy

CBI? ☐ Yes

C2-8. What is the destination(s) of the vacuum water for the dry fly ash handling system? If the plant recycles the process wastewater, indicate the plant process to which this process wastewater is recycled. [Check all boxes that apply.]

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

☐ Transferred to on-site treatment system. Identify the type of treatment system below. [Check all boxes that apply.

☐ Settling pond ☐ Constructed wetlands

☐ pH adjustment ☐ Other, specify: ______

☐ Chemical precipitation

☐ 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

☐ Other, explain: ______

CBI? ☐ Yes

C2-9. In Table C-4, identify the destination(s) for fly ash from this steam electric generating unit. Provide the distribution of the wet and dry fly ash by destination and whether the storage identified is an intermediate or final destination.

Note: The sum of the percentage of ash distribution should equal 100% for the dry and wet fly ash, separately.

Table C-4. Storage Destinations that Receive Fly Ash

Dry Conveyed Fly Ash			Wet Conveyed Fly Ash		
Storage Destination(s)	**Percent of Dry Conveyed Fly Ash to this Destination**	**Destination Type**	**Storage Destination(s)**	**Percent of Wet Conveyed Fly Ash to this Destination**	**Destination Type**
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Total Dry	**100 %**		**Total Wet**	**100 %**	

CBI? ☐ Yes

C2-10. Was the fly ash from this steam electric generating unit conveyed both *wet and dry* in 2009?

- ○ Yes (Continue)
- ○ No (Skip to Question C2-13)

CBI? ☐ Yes

C2-11. Indicate why fly ash from the steam electric generating unit was conveyed both wet and dry in 2009. [Check all boxes that apply.] For each selection, identify the number of days in 2009 the wet system was operated for this reason.

- ☐ Wet fly ash handling system operated during times in which the dry fly ash was not marketable. _____ days
- ☐ Wet fly ash handling system operated when the dry fly ash collection system was not operational due to maintenance issues. _____ days
- ☐ Wet fly ash handling system operated in order to maintain its function as a backup to the dry system (i.e., wet system operated to ensure that it is still functional.) _____ days
- ☐ Wet fly ash handling system operated because the dry fly ash handling system does not have the capacity to handle all of the fly ash. _____ days
- ☐ Other, explain: _____ _____ days

CBI? ☐ Yes

C2-12. What modifications would be required to handle all the fly ash with the dry fly ash handling system? [Check all boxes that apply.]

- ☐ No system modifications necessary. Procedural changes would be sufficient.
- ☐ Increase the capacity of the silo(s).
- ☐ Increase the number of silos.
- ☐ Modify the loading silos to have the ability to moisture condition the ash.
- ☐ Install/increase the capacity of landfills.
- ☐ Increase the capacity of the dry fly ash conveying equipment.
- ☐ Design/develop new infrastructure to dispose of dry ash. Specify new infrastructure needed: _____
- ☐ Other, explain: _____

CBI? ☐ Yes

C2-13. If the current fly ash handling operations for the steam electric generating unit are expected to significantly change by December 31, 2020, indicate how (i.e., convert to or add dry handling capability). [Check all boxes that apply.]

- ☐ Expand capacity (handling and/or storage).
- ☐ Decreased use of wet fly ash handling system. _____ (expected operating days per year for wet system)
- ☐ End use of wet fly ash handling system. _____ (expected end date)
- ☐ No change expected in fly ash handling operations.
- ☐ Other, explain: _____

CBI? ☐ Yes

C2-14. Was dry fly ash handling installed as a retrofit to the steam electric generating unit?

- ○ NA, this unit does not use dry fly ash handling (Skip to Question C2-17)
- ○ No (Skip to Question C2-17)
- ○ Yes (Continue)

Year Built: _____

Shutdown time (days) required to bring dry fly ash handling system on line: _____

Was a generating unit outage(s), outside of regularly scheduled outages, required to bring the dry fly ash handling system on line?

- ○ Yes
- ○ No

CBI? ☐ Yes

C2-15. What type of retrofit was the dry fly ash handling system?

- ○ The retrofit was made to an existing dry system. (Skip to Question C2-23)
- ○ A dry fly ash handling system was installed (for operation in addition to the wet fly ash handling system). (Continue)
- ○ The retrofit was a complete conversion from a wet to dry fly ash handling system. (Continue)

CBI? ☐ Yes

C2-16. Describe the changes that were required to retrofit (for a retrofit to an existing dry system, an installation of a dry system, or a complete conversion from wet to dry). [Check all boxes that apply.]

- ☐ Physical changes to facility
  - ☐ Installation of pressure/vacuum system and piping
  - ☐ Expansion of pressure/vacuum system and piping
  - ☐ Installation of storage silos
  - ☐ Modification of the silos to moisture-condition the ash
  - ☐ Modification of the silos for ash transfer to rail cars
  - ☐ Modification of the silos for marketable ash
  - ☐ Construction of haul roads
  - ☐ Construction of rail track
  - ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6: _____
  - ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6: _____
  - ☐ Changes to air permit
  - ☐ Other, explain: _____
- ☐ Changes in personnel/training, explain: _____
- ☐ Changes in ash disposal practices
  - ☐ Storage of ash in landfills. Provide the landfill ID(s) from Table A-6: _____
  - ☐ Marketing of ash
  - ☐ Hauling ash to off-site storage
  - ☐ Dust suppression activities
  - ☐ Other, explain: _____

CBI? ☐ Yes

C2-17. Is the plant in the process of installing a dry fly ash handling system to handle some or all of the ash currently handled by the wet fly ash handling system?

- ○ Yes — Estimated shutdown time (days) required to bring dry fly ash handling system online: _____ (Skip to Question C2-19)
- ○ No (Continue to Question C2-18)

CBI? ☐ Yes

C2-18. Is the plant planning to install a dry fly ash handling system by December 31, 2020 to handle some or all of the ash currently handled by the wet fly ash handling system?

- ○ Yes — Estimated shutdown time (days) required to bring dry fly ash handling system online: _____ (Continue to Question C2-19)
- ○ No (Skip to Question C2-22)

CBI? ☐ Yes

C2-19. If the plant is in the process of installing, or planning to install, a dry fly ash handing system by December 31, 2020, provide the cost estimates that have been developed for such a conversion/installation.

○ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)

○ No (Skip to Question C2-22)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

○ I have attached documentation/costs.

○ I did not attach documentation/costs. Below, explain why:

CBI? ☐ Yes

C2-20. Describe the modifications that will be required to install the dry fly ash handling system. [Check all boxes that apply.]

☐ Physical changes to facility
- ☐ Installation of pressure/vacuum system and piping
- ☐ Expansion of pressure/vacuum system and piping
- ☐ Installation of storage silos
- ☐ Modification of the silos to moisture-condition the ash
- ☐ Modification of the silos for ash transfer to railcars
- ☐ Modification of the silos for marketable ash
- ☐ Construction of haul roads
- ☐ Construction of rail track
- ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6:
- ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6:
- ☐ Changes to air permit
- ☐ Other, explain:

☐ Changes in personnel/training, explain:

☐ Changes in ash disposal practices
- ☐ Storage of ash in landfills. Provide the landfill ID(s) from Table A-6:
- ☐ Marketing of ash
- ☐ Hauling ash to off-site storage
- ☐ Dust suppression activities
- ☐ Other, explain:

CBI? ☐ Yes

C2-21. Indicate the types of destinations expected for the dry fly ash from the planned system and the percentage of the dry fly ash that is expected to go to each destination. [Check all boxes that apply.]

☐ Marketed, sold, and/or given away

Market Destinations _____ % of the dry fly ash

If other, specify: _____

Market Destinations _____ % of the dry fly ash

If other, specify: _____

Market Destinations _____ % of the dry fly ash

If other, specify: _____

☐ Stored in landfills reported in Table A-6 _____ % of the dry fly ash

☐ Stored in landfills NOT reported in Table A-6 _____ % of the dry fly ash

☐ Other, specify:

_____ _____ % of the dry fly ash

CBI? ☐ Yes

C2-22. If the plant is not in the process of installing or planning to install a dry fly ash handling system, have cost estimates been obtained/developed since January 1, 1995, for such a conversion/installation?

○ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)

○ No (Skip to Question C2-23)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

○ I have attached documentation/costs.

○ I did not attach documentation/costs. Below, explain why:

CBI? ☐ Yes

C2-23. Has the plant encountered any unscheduled outages on this generating unit caused by the fly ash handling system in the last five years?

○ Yes (Continue)

○ No (Skip to Section 2.2)

CBI?

☐ Yes

C2-24. In Table C-5, provide information on unscheduled generating unit outages caused by fly ash handling for each of the last five years.

Table C-5. Unscheduled Generating Unit Outages Caused by Fly Ash Handling

Year	Ash Handling	Total Days of Outage	Reason(s) for outage(s)	Method(s) Used to Resolve Outage(s)
2005	Dry			
	Wet			
2006	Dry			
	Wet			
2007	Dry			
	Wet			
2008	Dry			
	Wet			
2009	Dry			
	Wet			

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

Part: C
Section Title: 2.2. Fly Ash Handling - Storage and Use Data

Instructions: Complete Section 2.2 (Questions C2-25 through C2-29). Provide information for fly ash handling and fly ash storage at the plant.

CBI?
☐ Yes

C2-25. For each storage destination reported in Table C-4, provide the distance the fly ash is transported from the generating unit to intermediate storage or from intermediate storage to the final disposal/destination, the amount of fly ash transported in 2009, and the percent moisture of the fly ash entering storage, if transported dry. Additionally, for each destination indicate how the fly ash is transported by entering one of the following options: conveyor belt, pipe, truck, barge, rail, or other (provide a description). If the fly ash is sold to more than one destination (e.g., some fly ash is sold for cement manufacturing and some is sold for structural fill) enter the average percent moisture for all fly ash sold in Table C-6. Tables C-8 and C-9 will request information by market.

Table C-6. Fly Ash Storage Information

Storage Destination ID	Distance from the Generating Unit to Intermediate Storage or from the Intermediate Storage to the Final Disposal/Destination	Tons of Fly Ash Transported to Destination in 2009 (dry weight basis)	How is Fly Ash Transported to Destination?	Percent Moisture of the Fly Ash Entering Destination (if transported dry)
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	% ☐ NA, transported wet

CBI?
☐ Yes

C2-26. Is water used to moisten the fly ash?

○ Yes (Continue)
○ No (Skip to Question C2-28)

For each storage destination reported in Table C-4, provide information on water used to moisten the fly ash.

Table C-7. Water Used to Moisten the Fly Ash

Storage Destination ID	Source of the Water Used	Maximum Chlorides Concentration of Water Used to Moisten the Ash (ppm)	Maximum Solids Percentage of Water Used to Moisten the Ash (%)	Other Criteria
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	

Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	
Storage Destination Table Other:	☐ Raw Intake Water ☐ Intake water that has been treated on site prior to use ☐ Process Wastewaters Other: ☐ Process Wastewaters Other:	ppm	%	

CBI? ☐ Yes

C2-27. Indicate the criteria that the plant uses to determine if a water source is unacceptable for use (*recycle/reuse*) to moisten the ash. If the criteria are dictated by engineering design, provide specific elements of the design that dictate use.

CBI? ☐ Yes

C2-28. Does the plant market, sell, and/or give away fly ash from the dry ash handling system?

○ Yes (Continue)

○ No (Skip to Question C2-29)

Complete Table C-8 if the plant markets, sells, and/or gives away fly ash from the dry fly ash handling system. For each destination, provide the tons of fly ash marketed, sold, and/or given away, the gross revenue generated from marketing/selling the dry fly ash for calendar years 2005, 2007, and 2009. Additionally, provide the typical percent moisture of the fly ash during calendar years 2005, 2007, and 2009. If the typical percent moisture of the fly ash was not constant during calendar years 2005, 2007, and 2009, note this information (include all typical percent moisture values for each year) in the Comments page.

Table C-8. Fly Ash from the Dry Fly Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Fly Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/ Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/ Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI? ☐ Yes

C2-29. Does the plant market, sell, and/or give away fly ash from the wet ash handling system?

○ Yes (Continue)

○ No (Skip to Section 2.3)

Complete Table C-9 if the plant currently markets, sells, and/or gives away fly ash transported by wet sluicing from the fly ash handling system. For each destination, provide the tons, on a dry basis, of fly ash transported by wet sluicing that is marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the fly ash transported by wet sluicing for each destination.

Table C-9. Fly Ash Transported by Wet Sluicing from the Fly Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Fly Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/ Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/ Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

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

Part: C
Section Title: 2.3. Fly Ash Cost Information - Conveyance

Instructions: Complete Section 2.3 (Questions C2-30 through C2-36) for the conveyance of fly ash (wet or dry) from each unit identified in Table A-8. Provide these data for each fly ash handling system that began operating or was converted after January 1, 2000. Enter the Unit ID (use Unit IDs assigned in Table A-8) in the space provided above.

If you indicated in Question C2-17 or C2-18 that the plant is either installing or planning to install dry fly ash handling for this unit, complete Section 2.3, and check the "Planned" checkbox below.

☐ Planned

Make copies of Section 2.3 for each wet and dry fly ash handling system conveying ash from this unit that was operated in 2009, that began operating on or after January 1, 2000, is being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.3" button below.

The conveyance portion of the fly ash handling system refers to the part of the system that conveys fly ash from the fly ash collection equipment (ESP or baghouse) of the generating unit to intermediate or final storage (e.g., storage silos or ponds/impoundments). Common dry fly ash conveyance components include filter/separators, vacuum/pressure transfer stations, blowers, and associated high pressure piping (note that conveyance does NOT include storage or loading silos nor does it include movement between intermediate and final storage). Common wet fly ash conveyance components include sluicing equipment, associated piping, and pumps (note that conveyance does NOT include ponds/impoundments).

Note: If any components of the conveyance portion of the fly ash handling system are shared with one or more other generating units, only report those components and corresponding costs once.

Copy Section 2.3

CBI? ☐ Yes

C2-30. Identify the major components of the conveyance portion of the fly ash handling system, in particular those components that represent a significant portion of the capital or O&M costs for the system. Provide the type of component and the number of each type of component in the system. Additionally, provide the total system capacity of each type of unit component (i.e., volume of clarifying tanks). Total system capacity should equal the sum of the capacity of each individual component within that type.

Table C-10. Fly Ash System Components - Conveyance

Type of Component	Number of Components in the System	Total System Capacity of Components	
Fly Ash Conveyance Components			Component Units
Other:			If other, specify:
Fly Ash Conveyance Components			Component Units
Other:			If other, specify:
Fly Ash Conveyance Components			Component Units
Other:			If other, specify:
Fly Ash Conveyance Components			Component Units
Other:			If other, specify:
Fly Ash Conveyance Components			Component Units
Other:			If other, specify:
Fly Ash Conveyance Components			Component Units
Other:			If other, specify:
Fly Ash Conveyance Components			Component Units
Other:			If other, specify:

CBI?
☐ Yes

C2-31. Attach a block diagram that shows the entire fly ash handling system operations for this generating unit. Label the conveyance, intermediate storage (see Part C Section 2.4) and transport/disposal (see Part C Section 2.5) portions of the system. The diagram should include all major components indicated in Tables C-10 and C-13, if applicable, and identify all intermediate and final ash storage destinations. Indicate the movement of ash as well as water through the system. If ash from other generating units is combined with ash from this unit, indicate where the ash is combined and the portions of the ash handling system involved. Provide as many diagrams as necessary to convey this information. Include the plant name, plant ID, and unit ID in the upper right hand corner of the diagram.

Note: If the respondent indicates that the ash is transported to a pond/impoundment, in Question C2-38, the intermediate storage and disposal information will be provided in Part D. Therefore, the block diagram should only include the conveyance system(s).

☐ Diagram attached.

CBI?
☐ Yes

C2-32. List all of the major components of this fly ash conveyance system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Table C-10 at the contractor's expense.

CBI?
☐ Yes

C2-33. List all of the operation and maintenance activities of this fly ash conveyance system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the conveyance portion of the fly ash handling system at the contractor's expense .

CBI?

☐ Yes

C2-34. In Table C-11, provide costs incurred for this fly ash conveyance system since January 1, 2000, both for the conveyance as originally installed and for any modifications to the conveyance. Include all conveyance costs including costs for components in Table C-10 as well as control systems, pads, and foundations, and all other ancillary equipment. For planned fly ash conveyance systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all equipment for the conveyance portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-11. Capital Cost for Conveyance of Fly Ash Handling

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (including property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or installation of the system.				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI? ☐ Yes

C2-35. Are all major components of the conveyance portion of the fly ash handling system included in the capital costs reported in Table C-11?

○ Yes (Skip to Question C2-36)

○ No (Continue)

Please explain what system components are included in the capital costs listed in Table C-11. Additionally, identify the key components of the conveyance portion of the fly ash handling system that are not included in the capital costs reported in Table C-11.

CBI? ☐ Yes

C2-36. Provide annual (2009) O&M costs data in Table C-12 for this fly ash conveyance system, if it began operating or was converted on or after January 1, 2000. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the intermediate storage portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-11 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-12. O&M Cost for Conveyance of Fly Ash Handling for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

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

Part: C
Section Title: 2.4. Fly Ash Cost Information - Intermediate Storage

Instructions: Complete Section 2.4 (Questions C2-37 through C2-44) for each intermediate storage destination identified in Table C-6 that began operating or was modified after January 1, 2000. Enter the storage ID in the space provided above (use the storage IDs assigned in Table C-6).

If you indicated in Question C2-17 or C2-18 that the plant is either installing or planning to install dry fly ash handling for this unit, complete Section 2.4, and check the "Planned" checkbox below.

☐ Planned

Make copies of Section 2.4 for each fly ash handling system operated in 2009, that began operating on or after January 1, 2000, is being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.4" button below.

If you are instructed to skip forward to another section while completing this section for one fly ash storage destination, be sure to complete this section for all other fly ash storage destinations operated in 2009, being installed, or planned to be installed by December 31, 2020.

The intermediate storage portion of the fly ash handling system refers to the facility/site where collected fly ash is stored after conveyance, prior to the ash being transported to final disposal. Dry fly ash intermediate storage typically consists of storage silos. Wet fly ash intermediate storage typically consists of ponds/impoundments.

Note that intermediate storage includes all equipment and operations associated with loading dry or moisture-conditioned ash into trucks or rail cars for transport (but does not include the actual transport). Intermediate storage also includes all ash dust suppression activities at the plant, expect those at a pond/impoundment or landfill.

Copy Section 2.4

CBI? ☐ Yes

C2-37. Does this storage component store both fly and bottom ash together? For example, if bottom ash and fly ash are conveyed separately but stored in a common silo, the silo is considered a shared component.

○ Yes Provide unit IDs, as assigned in A-8, contributing bottom ash to this storage component.

○ No

CBI? ☐ Yes

C2-38. Is this storage destination a *pond/impoundment*?

○ Yes (Skip to Section 2.5)

○ No (Continue)

CBI?
☐ Yes

C2-39. Identify the major components of the intermediate storage portion of the fly ash handling system, in particular those components that represent a significant portion of the capital or O&M costs for the system. Provide the type of component and the number of each type of component in the system. Additionally, provide the total system capacity of each component (i.e., volume of silos). Total system capacity should equal the sum of the capacity of each individual component within that type.

Table C-13. Fly Ash Handling System Components - Intermediate Storage

Type of Component	Number of Components in the System	Total System Capacity of Components	
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:
Fly Ash Intermediate Storage Components			Component Units
Other:			If other, specify:

CBI?
☐ Yes

C2-40. List all of the major components of this intermediate storage destination that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Table C-13 at the contractor's expense.

CBI?
☐ Yes

C2-41. List all of the operation and maintenance activities associated with this intermediate storage destination that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the intermediate storage portion of the fly ash handling system at the contractor's expense .

CBI? ☐ Yes

C2-42. Provide cost data in Table C-14 for this intermediate storage destination, both for the storage as originally installed and for any modifications to the storage system, since January 1, 2000. Include all intermediate storage costs including costs for components in Table C-13 as well as control systems, pads and foundations, and all other ancillary equipment. For planned storage systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Capital costs associated with ponds/impoundments are requested in Part D and capital costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills in Table C-14.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks for the transportation of the fly ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-14. Capital Cost for Intermediate Storage of Fly Ash Handling

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (includes site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or installation of the system.				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI? ☐ Yes

C2-43. Are all major components of the intermediate storage destination included in the capital costs reported in Table C-14?

○ Yes (Skip to Question C2-44)

○ No (Continue)

Please explain what system components are included in the capital costs listed in Table C-14. Additionally, identify the key components intermediate storage destination that are not included in the capital costs reported in Table C-14.

CBI? ☐ Yes

C2-44. Provide annual O&M costs data in Table C-15 for this intermediate storage destination, if it began operating or was modified on or after January 1, 2000. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: O&M costs associated with ponds/impoundments are requested in Part D and O&M costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills costs in Table C-15.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the intermediate storage portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-14 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-15. O&M Cost for Intermediate Storage of Fly Ash Handling for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor (Water Trucks Only)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

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

Part: C
Section Title: 2.5. Fly Ash Cost Information - Transport/Disposal

Instructions: Complete Section 2.5 (Questions C2-45 through C2-52) for all transport/disposal of fly ash from fly ash handling systems that began operating or was modified after January 1, 2000, and those systems being installed, or planned to be installed by December 31, 2020.

The transport/disposal portion of the fly ash handling system refers to the transportation of fly ash from intermediate storage to final disposal.

An example of ash transport/disposal is transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically consists of roads and vehicles that are used to transport the ash. The capital and O&M costs for ash transport/disposal may include the road or rail infrastructure (roads, tracks, lights), the trucks and rail cars, the operation and maintenance costs associated with the trucks and rail cars, and ash disposal fees.

Note that capital and operation and maintenance costs associated with ponds/impoundments and landfills/landfilling are requested in Parts D and F, respectively, and they should not be provided here in Section 2.5.

CBI? ☐ Yes

C2-45. Does the plant use the same transport and disposal equipment for both fly and bottom ash? For example, if fly ash and bottom ash are transported using the same trucks, the trucks are considered a shared component.

○ Yes — Provide unit IDs, as assigned in A-8, and storage IDs, provided in Table C-6, contributing bottom ash to the transport and disposal system.

○ No — (Continue)

CBI? ☐ Yes

C2-46. Is a *pond/impoundment* unit or *pond/impoundment system* the final destination of all fly ash collected by the plant?

○ Yes — (Skip to Section 3.1)

○ No — (Continue)

CBI?
☐ Yes

C2-47. What methods are used to transport the collected fly ash to the final disposal? [Check all boxes that apply.]

☐ Trucks

How many trucks does the plant use for the transportation and disposal of dry fly ash?

Indicate whether the trucks were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Rail cars

How many rail cars does the plant use for the transportation and disposal of dry fly ash?

Indicate whether the rail cars were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Other, specify (e.g., barge):

CBI?
☐ Yes

C2-48. List all of the major components for transport/disposal of fly ash that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL ash transport/disposal equipment and/or infrastructure at the contractor's expense.

CBI?
☐ Yes

C2-49. List all of the operation and maintenance activities for transport/disposal of fly ash that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL transport/disposal activities at the contractor's expense.

CBI? ☐ Yes

C2-50. Provide cost data in Table C-16 for the transport/disposal of the collected fly ash, both for the transport/disposal as originally installed and for any modifications, since January 1, 2000. For planned transport/disposal systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Capital costs associated with ponds/impoundments are requested in Part D and capital costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills in Table C-16.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks for the transportation of the fly ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-16. Capital Cost for Transport/Disposal of Collected Fly Ash

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below: a. Engineering Contract Firm Costs b. Owner's Overhead Engineering Costs ☐ Hired outside engineering firm to oversee design and/or installation of the system.	$ $	$ $		
Construction expenses (includes temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI? ☐ Yes

C2-51. Are all major components of transport/disposal for the fly ash handling system included in the capital costs reported in Table C-16?

○ Yes (Skip to Question C2-52)

○ No (Continue)

Please explain what system components are included in the capital costs listed in Table C-16. Additionally, identify the key components of transport/disposal for the fly ash handling system that are not included in the capital costs reported in Table C-16.

CBI? ☐ Yes

C2-52. Provide annual O&M costs data in Table C-17 for the transport/disposal of the collected fly ash from ash handling systems that began operating on or after January 1, 2000. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: O&M costs associated with ponds/impoundments are requested in Part D and O&M costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills in Table C-17.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates the transportation and disposal of the ash at the contractor's expense, the plant should fill out "$ 0" for the cost of all operating O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-16 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-17. O&M Cost for Transport/Disposal of the Fly Ash for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption	Transport Rate
Operating Labor (Trucks/Rail Cars/Other Transport)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	Loads per day dpy
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Materials	$			
Energy	$	$ per kWh	kWh/hr	
Ash Removal/Disposal Fees	$			
Other:	$			
Other:	$			
Total O&M Cost (2009)	$			

Plant ID: Insert Plant ID
Plant Name: Insert Plant ID
SE Unit ID: Insert Unit ID

Part: C
Section Title: 3.1. Bottom Ash Handling - Generating Unit Level Information

Instructions: Throughout Section 3.1 (Questions C3-1 through C3-31), provide ash handling information for each steam electric generating unit operated at any time in 2009, including units that may have been idle for an extended period of time. Make copies of Section 3.1 for each steam electric generating unit using the "Copy Section 3.1" button below. Enter the steam electric generating Unit ID (use Unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 3.1

CBI? ☐ Yes

C3-1. Is bottom ash generated in any fossil-fueled steam electric generating units at the plant? See Part A Section 8 for steam electric generating unit fuel classifications.

○ Yes (Continue)
○ No (Skip to Section 4)

CBI? ☐ Yes

C3-2. Provide bottom ash handling information in Table C-18, for each steam electric generating unit reported in Table A-8, following these instructions:

- Provide bottom ash handling information at the steam electric generating unit level. For the purpose of this questionnaire, more than one type of bottom ash handling (e.g., wet sluicing, SCC) may be selected for one generating unit. Check all types of bottom ash handling that apply to this steam electric generating unit.
- Refer to the glossary and the "Part C Instructions" tab for definitions related to wet and dry bottom ash handling systems.

Table C-18. Bottom Ash Handling Systems Operated in 2009 by Generating Unit

Type of Boiler	Type of Bottom Ash Handling System	Typical Amount of Bottom Ash Produced in 2009 (Dry weight basis)		Typical Percent Moisture of Bottom Ash in 2009		Design Ash Handling Rate (Dry weight basis)		Number of Days Ash was Handled by the Bottom Ash Handling System in 2009		Loss on Ignition of Bottom Ash Produced (Provide typical range for 2009)	
		Wet Conveyed	Dry Conveyed	Wet Conveyed	Dry Conveyed	Wet Conveyed	Dry Conveyed	Wet Conveyed	Dry Conveyed	Wet Conveyed	Dry Conveyed
Wet-bottom Other:	☑ Wet sluicing ☐ Mechanical drag system ☐ Dry vacuum ☐ Dry pressure ☐ Other:	1,500 tpd 365 dpy	0 tpd 0 dpy	30 % ☐ NA	% ☑ NA	5 tpd 5 dpy	0 tpd 0 dpy	365 days	0 days	1 to 2 % ☐ Not monitored ☐ NA	to % ☐ Not monitored ☑ NA
Type of Boiler Other:	☐ Wet sluicing ☐ Mechanical drag system ☐ Dry vacuum ☐ Dry pressure ☐ Other:	tpd dpy	tpd dpy	% ☐ NA	% ☐ NA	tpd dpy	tpd dpy	days	days	to % ☐ Not monitored ☐ NA	to % ☐ Not monitored ☐ NA

CBI? ☐ Yes

C3-3. Is wet sluicing used to collect bottom ash for this steam electric generating unit?

○ Yes (Continue)

○ No (Skip to Question C3-11)

Provide information for the wet bottom ash handling system in Table C-19. For the source of sluice water, you may enter more than one source from the following options:

- "IN" if *raw intake water* is used;
- "IN-Makeup" if raw intake water is only used as makeup;
- "TR" for use of *intake water* that has been *treated* on site prior to use;
- "TR-Makeup" if treated intake water is used only as makeup; and/or
- Process wastewater and/or treated wastewater described the code tables on the "Code Tables" tab provided at the end of this workbook.

An example is provided in Table C-19 for a plant that uses the effluent from its ash pond (WWT-1, as would be defined in Part A) for bottom ash sluicing and also makes up for losses with untreated river water (which is code IN-Makeup as shown above).

Table C-19. Process Wastewater Generated from Wet Bottom Ash Handling in 2009

Average Sluice Water Flow Rate (gpd)	Typical Duration AND Frequency of Sluicing (hpd AND dpy)	Source(s) of Sluice Water	Percent Contribution of Source to Sluice Water Flow
EXAMPLE:			
14,400,000 gpd	*24* hpd	WWT-1 Effluent	*90* %
	365 dpy	IN-Makeup	*10* %
		Sluice Water Source	%
		Other:	%
		Sluice Water Source	%
gpd	hpd	Sluice Water Source	%
	dpy	Sluice Water Source	%
		Other:	%

CBI? ☐ Yes

C3-4. For water sources that may be used as a source of *bottom ash sluice* water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and the maximum solids percentage that is acceptable for the water to be used for those purposes. [Check all boxes that apply.]

☐ Chlorides concentration, less than: ppm

☐ Solids percentage, less than: %

☐ Other: ppm

CBI? ☐ Yes

C3-5. Is any of the wet *bottom ash sluice* water immediately recycled (e.g., without treatment such as a pond) back to plant process?

○ Yes (Continue)

○ No (Skip to Question C3-6)

Describe how the wet *bottom ash sluice* is reused:

CBI? ☐ Yes

C3-6. Is any of the wet *bottom ash sluice* indirectly discharged to a publicly or privately owned treatment works?

○ **Yes**

○ **No**

CBI? ☐ Yes

C3-7. Does solids removal (other than in pond(s)/impoundment(s)) occur at the plant?

○ Yes (Continue)

○ No (Skip to Question C3-11)

CBI? ☐ Yes

C3-8. In Table C-20 provide solids removal information, on a dry ton basis, for the wet ash sluice system. For the purpose of Table C-20, solids removal does NOT include ash ponds.

Table C-20. Wet Ash Sluice Systems Operated in 2009

Solids Removal [Check all boxes that apply]	Bottom Ash Disposal [Check all boxes that apply]	Amount (tons) of Solids Disposed (Dry weight basis)	Typical Percent Moisture of Bottom Ash Disposed
☐ Dewatering bin	☐ Sold or given away without further treatment	_____ tons	_____ %
☐ Hydrocyclones	☐ Sold or given away after further treatment	_____ tons	_____ %
☐ Centrifuges	☐ Stored in/transferred to a pond/impoundment reported in Table A-4	_____ tons	_____ %
☐ Filters	☐ Stored in landfills reported in Table A-6	_____ tons	_____ %
☐ Other:	☐ Stored in landfills NOT reported in Table A-6	_____ tons	_____ %
_____	☐ Other: _____	_____ tons	_____ %

CBI? ☐ Yes

C3-9. Provide the amount of wastewater overflow from solids removal (e.g., dewatering bins) for the wet ash sluice system.

_____ gpd

CBI? ☐ Yes

C3-10. What is the destination(s) of the wastewater overflow from solids removal? If the plant recycles the wastewater, indicate the amount and the plant process to which this waste is recycled. [Check all boxes that apply.]

☐ Immediately recycled back to plant process.

Provide the amount of wastewater overflow that is recycled.

_____ gpd

Describe how the wastewater overflow is reused:

_____

☐ Transferred to on-site treatment system. Identify the type of treatment system below. [Check all boxes that apply.

☐ Settling pond ☐ Constructed wetlands

☐ pH adjustment ☐ Other, specify: _____

☐ 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

☐ Other, explain: _____

CBI? ☐ Yes

C3-11. Does the plant use a mechanical drag system (e.g., submerged chain conveyor (SCC)) to remove bottom ash from this generating unit boiler?

○ Yes (Continue)

○ No (Skip to Question C3-15)

Name the type and describe the process of removing bottom ash from the generating unit boiler(s).

CBI? ☐ Yes

C3-12. Is any process wastewater generated from overflow, or other means, from the mechanical drag system?

○ Yes (Continue)

○ No (Skip to Question C3-15)

CBI? ☐ Yes

C3-13. Provide the amount of wastewater overflow from the mechanical drag system.

_____ gpd

CBI? ☐ Yes

C3-14. What is the destination(s) of the wastewater overflow from the mechanical drag system? If the plant recycles the wastewater, indicate the amount and the plant process to which this waste is recycled. [Check all boxes that apply.]

☐ Immediately recycled back to plant process.

Provide the amount of wastewater overflow that is recycled.

_____ gpd

Describe how the wastewater overflow is reused:

☐ Transferred to on-site treatment system. Identify the type of treatment system below. [Check all boxes that apply.

☐ Settling pond ☐ Constructed wetlands

☐ pH adjustment ☐ Other, specify: _____

☐ 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

☐ Other, explain: _____

CBI? ☐ Yes

C3-15. In Table C-21, identify the destination(s) for wet and dry bottom ash transferred from the hopper(s) of this steam electric generating unit. Provide the distribution of the wet and dry ash by destination and whether the storage indentified is an intermediate or final destination.

Note: The sum of the percentage of ash distribution should equal 100% for the dry and wet bottom ash, separately.

Table C-21. Storage Destinations that Receive Bottom Ash

Dry Conveyed Bottom Ash			Wet Conveyed Bottom Ash		
Storage Destination(s)	**Percent of Dry Conveyed Bottom Ash to this Destination**	**Destination Type**	**Storage Destination(s)**	**Percent of Wet Conveyed Bottom Ash to this Destination**	**Destination Type**
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Storage Destination Table If other, explain:	%	○ Intermediate ○ Final	Storage Destination Table If other, explain:	%	○ Intermediate ○ Final
Total Dry	**100 %**		**Total Wet**	**100 %**	

CBI? ☐ Yes

C3-16. Was the bottom ash from this steam electric generating unit conveyed both *wet and dry* in 2009?

○ Yes (Continue)
○ No (Skip to Question C3-19)

CBI? ☐ Yes

C3-17. Indicate why bottom ash from the steam electric generating unit was conveyed both wet and dry in 2009. [Check all boxes that apply.] For each selection, identify the number of days in 2009 the wet system was operated for this reason.

☐ Wet bottom ash handling system operated during times in which the dry collected bottom ash was not marketable. ______ days

☐ Wet bottom ash handling system operated when the dry bottom ash collection system was not operational due to maintenance issues. ______ days

☐ Wet bottom ash handling system operated in order to maintain its function as a backup to the dry system (i.e., wet system operated to ensure that it is still functional.) ______ days

☐ Wet bottom ash handling system operated because the dry bottom ash handling system does not have the capacity to handle all of the bottom ash. ______ days

☐ Other, explain: ______ ______ days

CBI? ☐ Yes

C3-18. What modifications would be required to handle all the bottom ash with a dry bottom ash handling system? [Check all boxes that apply.]

☐ No system modifications necessary. Procedural changes would be sufficient.

☐ Increase the capacity of the silo(s).

☐ Increase the number of silos.

☐ Modify the loading silos to have the ability to moisture condition the ash.

☐ Install/increase the capacity of landfills.

☐ Increase the capacity of the dry bottom ash conveying equipment.

☐ Design/develop new infrastructure to dispose of dry ash. Specify the new infrastructure needed: ______

☐ Other, explain: ______

CBI? ☐ Yes

C3-19. If the current bottom ash handling operations for the steam electric generating unit are expected to significantly change by December 31, 2020, indicate how (i.e., convert to or add dry handling capability). [Check all boxes that apply.]

☐ Expand capacity (handling and/or storage).
☐ Decreased use of wet bottom ash handling system. _____ (expected operating days per year for wet system)
☐ End use of wet bottom ash handling system. _____ (expected end date)
☐ No change expected in bottom ash handling operations.
☐ Other, explain: _____

CBI? ☐ Yes

C3-20. Was the dry bottom ash handling installed as a retrofit to the steam electric generating unit?

○ NA, this unit does not use dry bottom ash handling (Skip to Question C3-24)
○ No (Skip to Question C3-24)
○ Yes (Continue)

Year Built: _____

Shutdown time (days) required to bring dry bottom ash handling system on line: _____

Was a generating unit outage(s), outside of regularly scheduled outages, required to bring the dry bottom ash handling system on line?

○ Yes
○ No

CBI? ☐ Yes

C3-21. What type of retrofit was the dry bottom ash handling system?

○ The retrofit was made to an existing dry system. (Skip to Question 3-29)
○ A dry bottom ash handling system was installed (for operation in addition to the wet fly ash handling system). (Continue)
○ The retrofit was a complete conversion from a wet to dry bottom ash handling system. (Continue)

CBI? ☐ Yes

C3-22. Describe the changes that were required to retrofit (for a retrofit to an existing dry system, an installation of a dry system, or a complete conversion from wet to dry). [Check all boxes that apply.]

☐ Physical changes to facility
- ☐ Installation of pressure/vacuum system and piping
- ☐ Boiler alteration to accommodate the mechanical drag system
- ☐ Expansion of pressure/vacuum system and piping
- ☐ Installation of storage silos
- ☐ Modification of the silos to moisture-condition the ash
- ☐ Modification of the silos for ash transfer to rail cars
- ☐ Modification of the silos for marketable ash
- ☐ Construction of haul roads
- ☐ Construction of rail track
- ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6: _____
- ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6: _____
- ☐ Changes to air permit _____
- ☐ Other, explain: _____

☐ Changes in personnel/training, explain:

☐ Changes in ash disposal practices
- ☐ Storage of ash in landfills. Provide the landfill ID(s) from Table A-6: _____
- ☐ Marketing of ash
- ☐ Hauling ash to off-site storage
- ☐ Dust suppression activities
- ☐ Other, explain: _____

CBI? ☐ Yes

C3-23. Attach an engineering process diagram(s) for the dry bottom ash handling system retrofit that depicts (with dimensions) the conveyance portion of the system (e.g., a diagram(s) that depicts how the dry bottom ash system is configured within the building to convey bottom ash from the boiler(s) to the building exit).

☐ Diagram attached.

CBI? ☐ Yes

C3-24. Is the plant in the process of installing a dry bottom ash handling system to handle some or all of the ash currently handled by the wet bottom ash handling system?

○ Yes Estimated shutdown time (days) required to bring dry bottom ash handling system online: _____ (Skip to Question C3-26)

○ No (Continue to Question C3-25)

CBI? ☐ Yes

C3-25. Is the plant planning to install a dry bottom ash handling system to handle some or all of the ash currently handled by the wet bottom ash handling system?

○ Yes Estimated shutdown time (days) required to bring dry bottom ash handling system online: _____ (Continue to Question C3-26)

○ No (Skip to Question C3-29)

CBI? ☐ Yes

C3-26. If the plant is in the process of installing, or planning to install, a dry bottom ash handing system by December 31, 2020, provide the cost estimates that have been developed for such a conversion/installation.

○ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)

○ No (Skip to Question C3-29)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

○ I have attached documentation/costs.

○ I did not attach documentation/costs. Below, explain why:

_____

CBI? ☐ Yes

C3-27. Describe the modifications that will be required to install the dry bottom ash handling system. [Check all boxes that apply.]

☐ Physical changes to facility

- ☐ Installation of mechanical drag system
- ☐ Boiler alteration to accommodate the mechanical drag system
- ☐ Installation of completely dry bottom ash handling system
- ☐ Installation of storage silos
- ☐ Modification of the silos to moisture-condition the ash
- ☐ Modification of the silos for ash transfer to rail cars
- ☐ Modification of the silos for marketable ash
- ☐ Construction of haul roads
- ☐ Construction of rail track
- ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6: _____
- ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6: _____
- ☐ Changes to air permit
- ☐ Other, explain: _____

☐ Changes in personnel/training, explain: _____

☐ Changes in ash disposal practices

- ☐ Storage of ash in landfill. Provide the landfill ID(s) from Table A-6: _____
- ☐ Marketing of ash
- ☐ Hauling ash to off-site storage
- ☐ Dust suppression activities
- ☐ Other, explain: _____

CBI? ☐ Yes

C3-28. Indicate the types of destinations expected for the dry bottom ash from the planned system and the percentage of the dry bottom ash that is expected to go to each destination. [Check all boxes that apply.]

☐ Marketed, sold, and/or given
Market Destinations _____ % of the dry bottom ash
If other, specify: _____
Market Destinations _____ % of the dry bottom ash
If other, specify: _____
Market Destinations _____ % of the dry bottom ash
If other, specify: _____

☐ Stored in landfills reported in Table A-6 _____ % of the dry bottom ash

☐ Stored in landfills NOT reported in Table A-6 _____ % of the dry bottom ash

☐ Other, specify: _____ _____ % of the dry bottom ash

CBI? ☐ Yes

C3-29. If the plant is not in the process of installing or planning to install a dry bottom ash handling system, have cost estimates been obtained/developed since January 1, 1995, for such a conversion/installation?

○ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)
○ No (Skip to Question C3-30)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

○ I have attached documentation/costs.

○ I did not attach documentation/costs. Below, explain why:

CBI? ☐ Yes

C3-30. Has the plant encountered any unscheduled outages on this generating unit caused by the bottom ash handling system in the last five years?

○ Yes (Continue)
○ No (Skip to Section 3.2)

CBI?
☐ Yes

C3-31. In Table C-22, provide information on unscheduled generating unit outages caused by bottom ash handling for each of the last five years.

Table C-22. Unscheduled Generating Unit Outages Caused by Bottom Ash Handling

Year	Ash Handling	Total Days of Outage	Reason(s) for outage(s)	Method(s) Used to Resolve Outage(s)
2005	Dry			
	Wet			
2006	Dry			
	Wet			
2007	Dry			
	Wet			
2008	Dry			
	Wet			
2009	Dry			
	Wet			

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

Part: C
Section Title: 3.2 Bottom Ash Handling - Storage and Use Data

Instructions: Complete Section 3.2 (Questions C3-32 through C3-34). Provide information for bottom ash handling and bottom ash storage at the plant.

CBI?
☐ Yes

C3-32. For each storage destination reported in Table C-21, provide the distance the bottom ash is transported from the generating unit to intermediate storage or from intermediate storage to the final disposal/destination, the amount of bottom ash transported in 2009, and the percent moisture of the bottom ash entering storage, if transported dry. Additionally, for each destination indicate how the bottom ash is transported by entering one of the following options: conveyor belt, pipe, truck, barge, rail, or other (provide a description). If the bottom ash is sold to more than one destination (e.g., some bottom ash is sold for cement manufacturing and some is sold for structural fill) enter the average percent moisture for all bottom ash sold in Table C-23. Tables C-24 and C-25 will request information by market.

Table C-23. Bottom Ash Storage Information

Storage Destination ID	Distance from the Generating Unit to Intermediate Storage or from the Intermediate Storage to the Final Disposal/Destination	Tons of Bottom Ash Transported to Destination in 2009 (dry weight basis)	How is Bottom Ash Transported to Destination?	Percent Moisture of the Bottom Ash Entering Destination
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%
Storage Destination Table Other:	miles	tons	Storage Transport If other, explain:	%

CBI?
☐ Yes

C3-33. Does the plant market, sell, and/or give away dry bottom ash from the dry ash handling system?

○ Yes (Continue)

○ No (Skip to Question C3-34)

Complete Table C-24 if the plant markets, sells, and/or gives away dry bottom ash from the bottom ash handling system. For each destination, provide the tons of dry bottom ash marketed, sold, and/or given away, the gross revenue generated from marketing/selling the dry bottom ash for calendar years 2005, 2007, and 2009. Additionally, provide the typical percent moisture of the bottom ash during calendar years 2005, 2007, and 2009. If the typical percent moisture of the bottom ash was not constant during calendar years 2005, 2007, and 2009, note this information (include all typical percent moisture values for each year) in the Comments page.

Table C-24. Dry Bottom Ash from the Bottom Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Bottom Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/ Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/ Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI?
☐ Yes

C3-34. Does the plant market, sell, and/or give away wet bottom ash from the wet ash handling system?

○ Yes (Continue)

○ No (Skip to Section 3.3)

Complete Table C-25 if the plant currently markets, sells, and/or gives away bottom ash transported by wet sluicing from the bottom ash handling system. For each destination, provide the tons, on a dry basis, of bottom ash transported by wet sluicing that is marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the bottom ash transported by wet sluicing for each destination.

Table C-25. Bottom Ash Transported by Wet Sluicing from the Bottom Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Bottom Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/ Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/ Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

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

Part: C
Section Title: 3.3. Bottom Ash Cost Information - Conveyance

Instructions: Complete Section 3.3 (Questions C3-35 through C3-41) for the conveyance of bottom ash (wet or dry) from each unit identified in Table A-8. Provide these data for each bottom ash handling system that began operating or was converted after January 1, 2000. Enter the Unit ID in the space provided above.

If you indicated in Question C3-24 or C3-25 that the plant is either installing or planning to install dry bottom ash handling for this unit, complete Section 3.3, and check the "Planned" checkbox below.

☐ Planned

Make copies of Section 3.3 for each bottom ash handling system operated in 2009, that began operating on or after January 1, 2000, is being installed, or planned to be installed by December 31, 2020 using the "Copy Section 3.3" button below.

The conveyance portion of the bottom ash handling system refers to the part of the system that conveys bottom ash from the boiler(s) of the unit to the intermediate or final storage of the bottom ash. Dry bottom ash handling includes systems that collect and convey the bottom ash without any use of water, as well as systems in which bottom ash is conveyed mechanically or pneumatically away from a quench water bath (e.g., submerged chain conveyor systems). Wet bottom ash conveyance uses water (i.e., a sluice) to convey bottom ash away from the boiler to intermediate/final storage (e.g., ponds/impoundments). Note that dewatering bins are considered part of bottom ash conveyance.

Note: Bottom ash conveyance includes all capital and O&M costs required to dredge or empty ponds, dewatering bins, and/or surge tanks to intermediate storage.

Note: If any components of the conveyance portion of the bottom ash handling system are shared with one or more other generating units, only report those components and corresponding costs once.

Copy Section 3.3

CBI?
☐ Yes

C3-35. Identify the major components of the conveyance portion of the bottom ash handling system, in particular those components that represent a significant portion of the capital or O&M costs for the system. Provide the type of component and the number of each type of component in the system. Additionally, provide the total system capacity of each type of component (i.e., volume of clarifying tanks). Total system capacity should equal the sum of the capacity of each individual component within that type.

Table C-26. Bottom Ash Handling System Components - Conveyance

Type of Components	Number of Components in the System	Total System Capacity of Components	
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:
Bottom Ash Conveyance Components			Component Units
Other:			If other, specify:

CBI? ☐ Yes

C3-36. Attach a block diagram that shows the entire bottom ash handling system operations for this generating unit. Label the conveyance, intermediate storage (see Part C Section 3.4) and transport/disposal (see Part C Section 3.5) portions of the system. The diagram should include all key components indicated in Tables C-26 and C-29 and identify all intermediate and final ash storage destinations. Indicate the movement of ash as well as water through the system. If ash from other generating units is combined with ash from this unit, indicate where the ash is combined and the portions of the ash handling system involved. Provide as many diagrams as necessary to convey this information. Include the plant name, plant ID, and the unit ID in the upper right hand corner of the diagram.

Note: If the respondent indicates that the ash is transported to a pond/impoundment, in Question C3-43, the intermediate storage and disposal information will be provided in Part D. Therefore, the block diagram should only include the conveyance system(s).

☐ Diagram attached.

CBI? ☐ Yes

C3-37. List all of the major components of this bottom ash conveyance system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Table C-26 at the contractor's expense.

CBI? ☐ Yes

C3-38. List all of the operation and maintenance activities of this bottom ash conveyance system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the conveyance portion of the bottom ash handling system at the contractor's expense.

CBI? ☐ Yes

C3-39. In Table C-27, provide capital costs incurred since January 1, 2000, for this bottom ash conveyance system, both for the conveyance as originally installed and for any modifications to the conveyance. Include all conveyance costs including costs for components in Table C-26 as well as control systems, pads and foundations, and all other ancillary equipment. For planned bottom ash conveyance systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all equipment for the conveyance portion of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-27. Capital Cost for Conveyance of Bottom Ash Handling

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (includes site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (includes process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or installation of the system.				
Construction expenses (includes temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI? ☐ Yes

C3-40. Are all major components of the conveyance portion of the bottom ash handling system included in the capital costs reported in Table C-27?

○ Yes (Skip to Question C3-41)

○ No (Continue)

Please explain what system components are included in the capital costs listed in Table C-27. Additionally, identify the key components of the conveyance portion of the bottom ash handling system that are not included in the capital costs reported in Table C-27.

CBI? ☐ Yes

C3-41. Provide annual (2009) O&M costs data in Table C-28 for this bottom ash conveyance system, if it began operating or was converted on or after January 1, 2000. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the conveyance portion of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-27 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-28. O&M Cost for Conveyance of Bottom Ash Handling for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

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

Part: C
Section Title: 3.4. Bottom Ash Cost Information - Intermediate Storage

Instructions: Complete Section 3.4 (Questions C3-42 through C3-49) for each intermediate storage destination identified in Table C-23 that began operating or was modified after January 1, 2000. Enter the storage ID in the space provided above (use the storage IDs assigned in Table C-23).

If you indicated in Question C3-25 or C3-26 that the plant is either installing or planning to install dry bottom ash handling for this unit, complete Section 3.4, and check the "Planned" checkbox below.

☐ Planned

Make copies of Section 3.4 for each bottom ash handling system operated in 2009, that began operating on or after January 1, 2000, is being installed, or planned to be installed by December 31, 2020 using the "Copy Section 3.4" button below.

If you are instructed to skip forward to another section while completing this section for one bottom ash storage destination, be sure to complete this section for all other bottom ash storage destinations operated in 2009, being installed, or planned to be installed by December 31, 2020.

The intermediate storage of bottom ash handling refers to the facility/site where collected bottom ash is stored after conveyance, prior to the ash being transported to final disposal. Dry bottom ash intermediate storage typically consists of storage silos. Wet bottom ash intermediate storage typically consists of ponds/impoundments.

Note that intermediate storage includes all equipment and operations associated with loading dry or moisture-conditioned ash into trucks or rail cars for transport.
Intermediate storage also includes all ash dust suppression activities at the plant.

Copy Section 3.4

CBI? ☐ Yes

C3-42. Does this storage component store both fly and bottom ash together? For example, if bottom ash and fly ash are conveyed separately but stored in a common silo, the silo is considered a shared component.

○ Yes Provide unit IDs, as assigned in A-8, contributing fly ash to this storage component. _____ (Skip to Section 3.5)

○ No (Continue)

CBI? ☐ Yes

C3-43. Is this storage destination a pond/impoundment?

○ Yes (Skip to Section 4)

○ No (Continue)

CBI?
☐ Yes

C3-44. Identify the major components of the intermediate storage portion of the bottom ash handling system, in particular those components that represent a <u>significant</u> portion of the capital or O&M costs for the system. Provide the type of component and the number of each type of component in the system. Additionally, provide the total capacity of each component (i.e., volume of silos). Total system capacity should equal the sum of the capacity of each individual component within that type.

Table C-29. Bottom Ash Handling System Components - Intermediate Storage

Individual Components		Number of Components in the System	Total System Capacity of Components	
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:
Bottom Ash Intermediate Storage Components				Component Units
Other:				If other, specify:

CBI?
☐ Yes

C3-45. List all of the major components of this intermediate storage destination that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Table C-29 at the contractor's expense.

CBI?
☐ Yes

C3-46. List all of the operation and maintenance activities of this intermediate storage destination that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the intermediate storage portion of the bottom ash handling system at the contractor's expense.

CBI?
☐ Yes

C3-47. Provide cost data in Table C-30 for this intermediate storage destination, both for the storage as originally installed and for any modifications to the storage system. Include all intermediate storage costs including costs for components in Table C-29 as well as control systems, pads and foundations, and all other ancillary equipment. For planned storage, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Capital costs associated with ponds/impoundments are requested in Part D and capital costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills in Table C-30.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks for the transportation of the bottom ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-30. Capital Cost for Intermediate Storage of Bottom Ash Handling

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (including property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or installation of the system.				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI? ☐ Yes

C3-48. Are all major components of the intermediate storage destination included in the capital costs reported in Table C-30?

○ Yes (Skip to Question C3-49)

○ No (Continue)

Please explain what system components are included in the capital costs listed in Table C-30. Additionally, identify the key components intermediate storage destination that are not included in the capital costs reported in Table C-30.

CBI? ☐ Yes

C3-49. Provide annual O&M costs data in Table C-31 for this intermediate storage destination, if it began operating or was modified on or after January 1, 2000. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: O&M costs associated with ponds/impoundments are requested in Part D and O&M costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills costs in Table C-31.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the intermediate storage portion of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-30 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-31. O&M Cost for Intermediate Storage of Bottom Ash Handling for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor (Water Trucks Only)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

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

Part: C
Section Title: 3.5. Bottom Ash Cost Information - Transport/Disposal

Instructions: Complete Section 3.5 (Questions C3-50 through C3-57) for all transport and disposal of bottom ash from ash handling systems that began operating or was modified after January 1, 2000, and those systems being installed, or planned to be installed by December 31, 2020.

The transport/disposal portion of the bottom ash handling system refers to the transportation of bottom ash from intermediate storage to final disposal.

An example of ash transport/disposal is transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically consists of roads and vehicles that are used to transport the ash. The capital and O&M costs for ash transport/disposal may include the road or rail infrastructure (roads, tracks, lights), the trucks and rail cars, the operation and maintenance costs associated with the trucks and rail cars, and ash disposal fees.

Note that capital and operation and maintenance costs associated with ponds/impoundments and landfills/landfilling are requested in Parts D and F, respectively, and they should not be provided here in Section 3.5.

CBI? ☐ Yes

C3-50. Does the plant use the same transport and disposal methods for both fly and bottom ash? For example, if fly ash and bottom ash are transported using the same trucks, the trucks are considered a shared component.

○ Yes — Provide unit IDs, as assigned in A-8, and storage IDs, provided in Table 6, contributing fly ash to the transport and disposal system. _____ (Skip to Section 4)

○ No — (Continue)

CBI? ☐ Yes

C3-51. Is a *pond/impoundment* unit or *pond/impoundment system* the final destination of all bottom ash collected by the plant?

○ Yes — (Skip to Section 4)

○ No — (Continue)

CBI?
☐ Yes

C3-52. What methods are used to transport the collected bottom ash to the final disposal? [Check all boxes that apply.]

☐ Trucks

How many trucks does the plant use for the transportation and disposal of dry bottom ash?

Indicate whether the trucks were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Rail cars

How many rail cars does the plant use for the transportation and disposal of dry bottom ash?

Indicate whether the rail cars were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Other, specify (e.g., barge):

CBI?
☐ Yes

C3-53. List all of the major components for transport/disposal of the bottom ash that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL ash transport/disposal equipment and/or infrastructure at the contractor's expense.

CBI?
☐ Yes

C3-54. List all of the operation and maintenance activities for transport/disposal of the bottom ash that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL transport/disposal activities at the contractor's expense.

CBI?
☐ Yes

C3-55. Provide cost data in Table C-32 for the transport/disposal of the collected bottom ash, both for the transport/disposal as originally installed and for any modifications. For transport/disposal systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Capital costs associated with ponds/impoundments are requested in Part D and capital costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills in Table C-32.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks for the transportation of the fly ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-32. Capital Cost for Transport/Disposal of Collected Bottom Ash

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or installation of the system.				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI? ☐ Yes

C3-56. Are all major components of transport/disposal for the bottom ash handling system included in the capital costs reported in Table C-32?

○ Yes (Skip to Question C3-57)

○ No (Continue)

Please explain what system components are included in the capital costs listed in Table C-32. Additionally, identify the key components of transport/disposal for the bottom ash handling system that are not included in the capital costs reported in Table C-32.

CBI? ☐ Yes

C3-57. Provide annual O&M costs data in Table C-33 for the transport/disposal of the collected bottom ash from ash handling systems that began operating on or after January 1, 2000. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: O&M costs associated with ponds/impoundments are requested in Part D and O&M costs associated with landfills/landfilling are requested in Part F. Do NOT include the costs for ponds and landfills in Table C-33.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates the transportation and disposal of the ash at the contractor's expense, the plant should fill out "$ 0" for the cost of all operating O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-32 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-33. O&M Cost for Transport/Disposal of the Bottom Ash for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption	Transport Rate
Operating Labor (Trucks/Rail Cars/Other Transport)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	Loads per day dpy
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Materials	$			
Energy	$	$ per kWh	kWh/hr	
Ash Removal/Disposal Fee	$			
Other:	$			
Other:	$			
Total O&M Cost (2009)	$			

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 4. Economizer Ash Handling Information

Instructions: Make copies of Section 4 (Questions C4-1 through C4-6) for each fossil-fueled steam electric generating unit at your plant that generates economizer ash using the "Copy Section 4" button below. See Part A Section 8 for steam electric generating unit fuel classifications. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 4

CBI? ☐ Yes

C4-1. Is economizer ash from this fossil-fueled steam electric generating unit collected with air heater ash?

○ Yes (Complete the remainder of Section 4 for economizer and air heater ash together. Do NOT complete Section 5.)

○ No (Continue)

CBI? ☐ Yes

C4-2. Indicate the method of handling the economizer ash.

○ Segregated from fly and bottom ash

Describe how the segregated ash was handled: _____ (Skip to Question C4-4)

○ Combined with fly and/or bottom ash (Continue)

CBI? ☐ Yes

C4-3. Identify how the economizer ash is combined with fly ash and/or bottom ash.

○ Handled wet, with fly ash

○ Handled wet, with bottom ash

○ Handled dry, with fly ash

○ Handled dry, with bottom ash

○ Other, explain:

_____

CBI? ☐ Yes

C4-4. Provide the average amount of dry economizer ash produced.

_____ tpd (dry weight basis)

_____ dpy

CBI? ☐ Yes

C4-5. Is process wastewater generated from the handling of economizer ash?

○ Yes (Continue)

○ No (Skip to Section 5)

Provide the volume of economizer ash wastewater generated in 2009 (gpd) and the frequency of economizer ash wastewater generation (days).

_____ gpd Over _____ days

Provide the destination of the economizer ash wastewater generated: Destination Codes Table

CBI? ☐ Yes

C4-6. What is the final disposition/destination of the collected economizer ash? [Check all boxes that apply.] Indicate the percentage of economizer ash transported to each destination.

☐ Stored in a landfill reported in Table A-6	_____ % of economizer ash
☐ Stored in a pond/impoundment reported in Table A-4	_____ % of economizer ash
☐ Stored in a landfill NOT reported in Table A-6	_____ % of economizer ash
☐ Hauled off site (to be marketed)	_____ % of economizer ash
☐ Hauled off site (to be given away)	_____ % of economizer ash
☐ Other: _____	_____ % of economizer ash

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 5. Air Heater Ash Handling Information

Instructions: Make copies of Section 5 (Questions C5-1 through C5-5) for each fossil-fueled steam electric generating unit at your plant that generates air heater ash using the "Copy Section 5" button below. See Part A Section 8 for steam electric generating unit fuel classifications. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 5

CBI? ☐ Yes

C5-1. Indicate the method of handling the air heater ash.

○ Segregated from fly and bottom ash
Describe how the segregated ash was handled: _____ (Skip to Question C5-3)

○ Combined with fly and/or bottom ash (Continue)

CBI? ☐ Yes

C5-2. Identify how the air heater ash is combined with fly ash and/or bottom ash.

○ Handled wet, with fly ash
○ Handled wet, with bottom ash
○ Handled dry, with fly ash
○ Handled dry, with bottom ash
○ Other, explain:
_____

CBI? ☐ Yes

C5-3. Provide the average amount of dry air heater ash produced.

_____ tpd (dry weight basis)
_____ dpy

CBI?
☐ Yes

C5-4. Is process wastewater generated from the handling of air heater ash?

○ Yes (Continue)

○ No (Skip to next Questionnaire Part)

Provide the volume of air heater ash wastewater generated in 2009 (gpd) and the frequency of air heater ash wastewater generation (days).

_____ gpd Over _____ days

Provide the destination of the air heater ash wastewater generated: Destination Codes Table

CBI?
☐ Yes

C5-5. What is the final disposition/destination of the collected air heater ash? [Check all boxes that apply.] Indicate the percentage of air heater ash transported to each destination.

☐ Stored in a landfill reported in Table A-6	_____ % of air heater ash
☐ Stored in a pond/impoundment reported in Table A-4	_____ % of air heater ash
☐ Stored in a landfill NOT reported in Table A-6	_____ % of air heater ash
☐ Hauled off site (to be marketed)	_____ % of air heater ash
☐ Hauled off site (to be given away)	_____ % of air heater ash
☐ Other: _____	_____ % of air heater ash

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

Part: C
Section Title: Part C 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).

CBI?	Question Number	Comment
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		

CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		

Steam Electric Questionnaire Code Tables

Process Wastewaters	
For Use in Tables and Questions throughout Parts A, B, C, D, and F.	
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

Treated Wastewaters	
For Use as Effluents from Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-4.	
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	FltBW
Sludge	SLDG
For Use as Influents to Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-3, AND Recycled Waters Throughout Questionnaire.	
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

Process Wastewaters	
For Use in Tables and Questions throughout Parts A, B, C, D, and F.	
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

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

Wastewater Treatment Units	
For Use in Tables and Questions Throughout Parts D and F.	
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

Destinations	
For Use in Tables and Questions Throughout Parts A, C, D, and F.	
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

Wastewater Treatment Units	
For Use in Tables and Questions Throughout Parts D and F.	
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

Destinations	
For Use in Tables and Questions Throughout Parts A, C, D, and F.	
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

Wastewater Treatment Units	
For Use in Tables and Questions Throughout Parts D and F.	
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

Solids Handling	
For Use as Planned Solids Handling for the FGD Slurry Blowdown in Part B Table B-2.	
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 C Drop Downs

Wet/Dry
Wet/Dry
Select
Wet
Dry

Type of Boiler
Type of Boiler
Select
Wet-bottom
Dry-bottom
Other

Storage Destination Table
Storage Destination Table
Select
Silo 1
Silo 2
Silo 3
Silo 4
Silo 5
Outdoor Pile 1
Outdoor Pile 2
Outdoor Pile 3
Outdoor Pile 4
Outdoor Pile 5
POND-1
POND-2
POND-3
POND-4
POND-5
POND-6
POND-7
POND-8
POND-9
POND-10
POND-A
POND-B
POND-C
LANDFILL-1
LANDFILL-2
LANDFILL-3
LANDFILL-4
LANDFILL-A
LANDFILL-B

LANDFILL-C
LANDFILL-D
Marketed, sold or given away
Stored in landfills NOT reported in Table A-6
Other

Destination Codes Table
Destination Codes Table
Select
Burned on site
Deep-well injection
Discharge to POTW
Discharge to PrOTW
Discharge to surface water
Evaporation
Hauled off site for reuse (removal fee)
Hauled off site for reuse (given away)
Hauled off site for reuse (marketed and sold)
Hauled off site for disposal
Mixed with fly ash for disposal
On-site landfill (as reported in Table A-6)
POND-1
POND-2
POND-3
POND-4
POND-5
POND-6
POND-7
POND-8
POND-9
POND-10
POND-A
POND-B
POND-C
WWT-1
WWT-2
WWT-3
WWT-4
WWT-5
WWT-6
WWT-A
WWT-B
WWT-C
Reuse as boiler water
Reuse as bottom ash sluice
Reuse as combined ash sluice
Reuse as FGD slurry preparation water

Reuse as FGD absorber makeup
Reuse as fly ash sluice
Reuse as mill reject sluice
Reuse in cooling towers

Sluice Water Source
Sluice Water Source
Select
IN
IN-Makeup
TR
TR-Makeup
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
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
POND-1 Effluent
POND-2 Effluent
POND-3 Effluent
POND-4 Effluent
POND-5 Effluent
POND-6 Effluent
POND-7 Effluent
POND-8 Effluent
POND-9 Effluent
POND-10 Effluent
POND-A Effluent
POND-B Effluent
POND-C Effluent
WWT-1 Effluent
WWT-2 Effluent
WWT-3 Effluent
WWT-4 Effluent
WWT-5 Effluent
WWT-6 Effluent
WWT-A Effluent
WWT-B Effluent
WWT-C Effluent

Process Wastewaters
Process Wastewaters
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
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

Fly Ash Conveyance Components
Fly Ash Conveyance Components
Select
Conveyor
Dewatering bin
Pressure blower
Transfer hopper
Wet vacuum equipment (e.g., hydroveyor)
Other

Fly Ash Intermediate Storage Components
Fly Ash Intermediate Storage Components
Select
Conveyor system (e.g., air slide, bucket conveyor)
Loading silo
Pug mill/pin mixer
Storage silo
Other

Bottom Ash Conveyance Components
Bottom Ash Conveyance Components
Select
Clarifying tank
Conveyor
Dewatering bin
Surge tank

Wet vacuum equipment (e.g., hydroveyor)
Other

Bottom Ash Intermediate Storage Components
Bottom Ash Intermediate Storage Components
Select
Conveyor system (e.g., air slide, bucket conveyor)
Loading silo
Pug mill/pin mixer
Storage silo
Other

Market Destinations
Market Destinations
Select
Aggregate
Agriculture
Blasting Grit/Roofing Granules
Blended Cement/Raw Feed for Clinker
Concrete/Concrete Products/Grout
Flowable Fill
Mineral Filler in Asphalt
Mining Applications
Road Base/Sub-base
Snow and Ice Control
Soil Modification/Stabilization
Structural Fills/Embankments
Waste Stabilization/Solidification
Other

Units
Units
Select
gpd
gpy

Component Units
Component Units
Select
gal
hp
in
Other

Combined Intermediate Storage Components
Combined Intermediate Storage Components

Select
Air slide
Baghouse for silos
Bin vent filter
Bucket conveyor
Conditioned load out spout with dust collection system
Conveyor system
Dust suppression (e.g., water truck)
Dry load out spout
Loading silo
Pug mill/pin mixer
Stackout/holding areas
Storage bin
Storage hopper
Storage silo
Vacuum loading equipment
Other

Storage Transport
Storage Transport
Select
Barge
Conveyor Belt
Pipe
Rail
Truck
Other