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Reporting Emissions from Crematories

Emissions Inventory Help Sheet

Maricopa County Air Quality Department

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What to Report

Crematories must report emissions of particulate matter (PM) primary, PM₁₀ primary, PM_{2.5} primary, carbon monoxide, nitrogen oxides, sulfur dioxide, volatile organic compounds (VOCs), ammonia, and hazardous air pollutants from cremation.

PM primary refers to all particulate matter emissions (filterable and condensable) from an emissions process. PM₁₀ primary refers to all PM primary that measures less than 10 microns in diameter. PM_{2.5} primary refers to all PM primary that measures less than 2.5 microns in diameter. PM₁₀ primary and PM_{2.5} primary are both subsets of PM primary.

How to Report

This help sheet shows emissions inventory preparers how to accurately report crematory emissions in the AQD Online Portal. First, preparers will use the “Task-Facility Inventory Change” tab to structure the emission units, processes, control equipment, and release points. Then, preparers will use the “Task-Emissions Inventory” tab to enter the operating schedule, throughput, and emissions factors for each process.

Task – Facility Inventory Change

Step 1

Click on the **Task-Facility Inventory Change** tab at the top of the page.



Step 2

Emission Units

There should be one “Incinerator (INC)” emission unit for each retort at the facility.

If these emission units are not in the facility inventory tree, click on the **Facility ID** at the top of the **Facility Inventory Tree** on the left side of the page. Click **Create Emission Unit** at the bottom of the page.

Expand Facility Tree

- F038071
 - INC001
 - INC002
 - INC003
 - INC004

Facility Information

Facility ID: F038071

Facility Name: Facility Creation Request Test 1

Facility Description:

Facility Class: Minor

Facility Type: Other (Miscellaneous)

Associated Monitor

Group ID:

Operating Status: Operating AFS:

Number of Employees:

Department:

NAICS

NAICS

Add NAICS Printable view Export to excel

NAICS reference information

Edit Validate Submit Download/Print Detail Print Facility Tree

Create Emissions Unit Create Control Equipment Create Release Point

Select **Incinerator** as the Emission Unit Type. Complete the required Emission Unit Information and click **Save**.

Emissions Unit Information

AQD ID:

* Emission Unit Type: Incinerator [Help me select the Emission Unit Type](#)

AQD Description:

* Company Equipment ID:

* Company Equipment Description:

* Operating Status: Not Yet Installed

* Quantity: 1
Enter a value greater than 1 only in the scenario where you have multiple "identical" emission units that have the same emissions process and where air flow follows the same path.

Initial Construction Commencement Date:

Initial Operation Commencement Date:

Most Recent Construction/Modification Commencement Date:

Most Recent Operation Commencement Date:

▼ Emission Unit Type Specific Information

* Incinerator Type: ▼

* Maximum Design Capacity:

* Minimum Design Capacity:

Pilot Gas Volume (scf/min):

Primary Chamber Operating Temperature (F):

Secondary Chamber Operating Temperature (F):

Heat Input Rating(MMBtu/hr):

* Burner System: ▼

* Units: ▼

* Units: ▼

▼ Permitted Emissions

This table is populated by AQD staff based on established/permitted emission limits. It is shown here for informational purposes only.

Pollutant	Potential Emissions		Allowable Emissions		Comments
	Lbs/Hour	Tons/Year	Lbs/Hour	Tons/Year	

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Save
Cancel

The **initial construction commencement date** is the date when construction or installation of the emission unit began.

The **initial operation commencement date** is the date when the facility began operating the emission unit.

Step 3

Emissions Processes

Each retort must have an emissions process depending on the type of cremation process that occurs in the retort. Use the following source classification codes, as applicable:

- 31502103 – Human cremation
- 31502104 – Animal cremation

If the emission units do not have a cremation emissions process attached, click on the **Emission Unit ID (INC004)** in the **Facility Inventory Tree** on the left side of the screen. Click **Create Emissions Process** at the bottom of the screen.

Emissions Unit Information

AQD ID: INC004

Emission Unit Type: Incinerator [Help me select the Emission Unit Type](#)

AQD Description:

Company Equipment ID: R4

Company Equipment Description: Retort #4

Operating Status: Operating

Quantity: 1

Enter a value greater than 1 only in the scenario where you have multiple "identical" emission units that have the same emissions process and whose air flow follows the same path.

Initial Construction Commencement Date: 11/22/2000

Initial Operation Commencement Date: 11/22/2000

Most Recent Construction/Modification Commencement Date:

Most Recent Operation Commencement Date:

Emission Unit Type Specific Information

Incinerator Type: Human Crematory Burner System: Ignition System

Maximum Design Capacity: 250.00 Units: lbs/hr

Minimum Design Capacity: 100.00 Units: lbs/hr

Pilot Gas Volume (scf/min):

Primary Chamber Operating Temperature (F):

Secondary Chamber Operating Temperature (F):

Heat Input Rating(MMBtu/hr):

Permitted Emissions

This table is populated by AQD staff based on established/permitted emission limits. It is shown here for informational purposes only.

Pollutant	Potential Emissions		Allowable Emissions		Comments
	Lbs/Hour	Tons/Year	Lbs/Hour	Tons/Year	

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Edit Create Cloned Emissions Unit

Create Emissions Process

Enter the **Company Process Description** and the applicable **Source Classification Code** and click Save.

Process Information

Process ID: PRC016
 Process Name:

Company Process Description:

* Source Classification Code (SCC):

Enter as 1-22-333-44 or 12233344

Select SCC through cascading levels search SCCs by keyword

Save Cancel

Step 4

Control Equipment

It is not necessary to associate control equipment with a cremation emission unit. All retorts have secondary chambers (afterburners) built in, so the afterburners are not considered “add on” control equipment.

Step 5

Release points

Create a release point for each stack at the facility. Click on the first cremation emissions process that is attached to the incinerator emission unit (**PRC016**) and click **Create and Associate Release Point**.

Expand Facility Tree

- [-] F038071
 - [-] ABS001
 - [-] ABS002
 - [-] CTW001
 - [-] FUG001
 - [-] FUG002
 - [-] FUG003
 - [-] INC001
 - [-] INC002
 - [-] INC003
 - [-] **PRC016**
 - [-] INC004
 - [-] INC005
 - [-] SEM001
 - [-] WWE001
 - [-] Disassociated CEs
 - FDS001

Process Information

Process ID: PRC016
 Process Name:

Company Process Description: Human Cremation
 Source Classification Code (SCC): 3-15-021-03
 SCC Level 1 Description: 3:Industrial Processes
 SCC Level 2 Description: 15:Photo Equip/Health Care/Labs/Air Condit/SwimPools
 SCC Level 3 Description: 021:Health Care - Crematoriums
 SCC Level 4 Description: 03:Cremation - Human

SCC reference information

Edit Delete

Create and Associate Control Equipment **Create and Associate Release Point**

Associate Existing Control Equipment Associate Existing Release Point

Disassociate Control Equipment Disassociate Release Point

Select the Release Point Type (usually Vertical), enter the release point information, and click **Save**. Stack parameters that are needed to create the release point can be found in the performance test report.

Release Point Information

AQD ID:

* Release Point Type: Vertical ▼

AQD Description:

* Company Release Point ID:

* Company Release Point Description:

* Operating status: Operating ▼

* Release Point Latitude: Facility Latitude: 33.32824

* Release Point Longitude: Facility Longitude: -111.82756

Release Point Type Specific Information

* Base Elevation (ft):
Feet above sea level

* Stack Height (ft):
Feet above base elevation

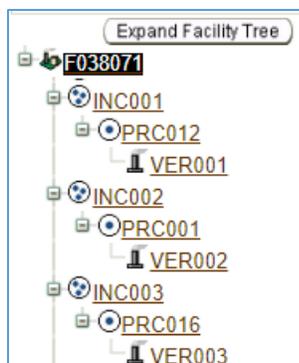
* Stack Diameter (ft):

* Exit Gas Velocity (ft/s): * Exit Gas Temp (F):

Exit Gas Flow Rate (acfm):
Flow rate is calculated by IMPACT:
3.1415927*Velocity*60*(Diameter/2)^2

Save
Cancel

The facility inventory tree should now contain one emission unit (INC) for each retort at the facility. Each emission unit (INC) should have a cremation emissions process (PRC) and a release point (VER) attached.



Step 6

Validate Facility Inventory Changes

Once you have finished adding emissions units, processes and control devices, you must validate the “Task – Facility Inventory Change.” Click on the **Facility ID** at the top of the Facility Inventory Tree. Click **Validate** at the bottom of the Facility Information screen.

Facility Information

Facility ID: F006332
Facility Name: AQ Production Validation
Facility Description:

Facility Class: Minor
Facility Type: Other (Unknown)

Associated Monitor Group ID:
Operating Status: Operating **AFS:**

Number of Employees:
Department:

▶ Annual Administrative Fee

▶ Location

▶ NAICS

If there are errors that need to be corrected, a pop-up window will appear. Click on the error message to be directed to the screen that contains the error that must be corrected. Correct all errors and repeat Step 5 to validate the facility inventory changes.

Severity	EU ID	Message
ERROR		Control Equipment [PAF001]: Attribute Change Frequency - specify units is not set.

Task – Emissions Inventory for Reporting Year

Step 1

Click on the **Task-Emissions Inventory** tab at the top of the page.



Step 2

Click Exclude/Include Emission Units

Most facilities do not track which bodies are cremated in each retort. As a result, most facilities will report all of their cremation emissions on one emission unit. When all cremation emissions are reported under one emission unit, report the emissions under the emission unit that was most recently performance tested.

Next to the emission unit that was most recently performance tested, click the box in the **Detailed Emissions** column. For all the other INC emission units, select **Reported Under Another EU** in the **Exclude Detailed Emissions Reporting** column. In the drop down, select the emission unit that is marked as Detailed Emissions

The example below shows a facility with six retorts, where INC002 was tested most recently. All of the emissions will be reported under INC002.

<input type="button" value="Mark All 'Detailed Emissions Reporting'"/> <input type="button" value="Mark All 'Less Than Reporting Requirement'"/> <input type="button" value="Mark All 'Did Not Operate'"/>			
Emission Unit	Company Equipment ID	Detailed Emissions	Exclude Detailed Emissions Reporting
INC001	284493	<input type="checkbox"/>	<input type="radio"/> Less Than Reporting Requirement <input type="radio"/> Did Not Operate <input checked="" type="radio"/> Reported Under Another EU INC002 ▾
INC002	284493	<input checked="" type="checkbox"/>	<input type="radio"/> Less Than Reporting Requirement <input type="radio"/> Did Not Operate <input type="radio"/> Reported Under Another EU
INC003	284494	<input type="checkbox"/>	<input type="radio"/> Less Than Reporting Requirement <input type="radio"/> Did Not Operate <input checked="" type="radio"/> Reported Under Another EU INC002 ▾
INC004	284495	<input type="checkbox"/>	<input type="radio"/> Less Than Reporting Requirement <input type="radio"/> Did Not Operate <input checked="" type="radio"/> Reported Under Another EU INC002 ▾
INC005	284495	<input type="checkbox"/>	<input type="radio"/> Less Than Reporting Requirement <input type="radio"/> Did Not Operate <input checked="" type="radio"/> Reported Under Another EU INC002 ▾
INC006	284495	<input type="checkbox"/>	<input type="radio"/> Less Than Reporting Requirement <input type="radio"/> Did Not Operate <input checked="" type="radio"/> Reported Under Another EU INC002 ▾

Step 3

Select the emissions process attached to the INC emission unit (**PRC001**) and click **Edit Material/Schedule/Seasons**.

1. Enter to **maximum number of hours per day**, **maximum number of days per week**, and the **number of weeks per year** the crematory operated.
2. Enter the **annual hours** of operation for the retorts during the calendar year.
3. Under **throughput**, enter to the total tons of remains cremated in all of the retorts combined.
4. Enter the percentage of remains that were cremated during each season:
 - a. Winter = January, February, and December
 - b. Spring = March, April, and May
 - c. Summer = June, July, and August
 - d. Fall = September, October, and November
5. Click **Save**.

Step 4

Click **Edit Emissions** at the bottom of the screen. Report emissions of all eight criteria air pollutants.

1. Report particulate matter emissions using the method **Time-based Factor – Stack Test**. Use the same method, hours uncontrolled, uncontrolled emissions factor, and time-based factor for all three categories of particulate matter (PM primary, PM₁₀ primary, and PM_{2.5} primary).
 - a. Uncontrolled emissions factor = 5.92 lb/ton¹
 - b. Time-based factor (lbs/hour) - refer to the MCAQD determination letter from your most recent performance test.
2. Report emissions of other criteria air pollutants using the method **Throughput-based Factor** and the following uncontrolled emissions factors¹ (which will auto populate in the AQD Online Portal):
 - Carbon monoxide = 0.6 lb/ton
 - Nitrogen oxides = 11 lb/ton
 - Sulfur dioxide = 1.4 lb/ton
 - Volatile organic compounds = 0.2 lb/ton
 - Ammonia = 0 lb/ton
3. Enter **Hours Uncontrolled** – this should be equal to actual hours for all criteria air pollutants.
4. Click **Save**. The AQD Online Portal will calculate emissions of each pollutant based on the reported throughput and the emissions factors provided.

Criteria Air Pollutants/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)	Time-based Factor (LBS/Hour)	Emissions Reported			Units	Explanation
					Fugitive Amount	Stack Amount	Total		
PM Primary (includes filterables > 10 microns + condensibles)	Time-based factor - Estimated	6120	5.92	0.11				TONS	add
PM10 Primary (includes filterables + condensibles)	Time-based factor - Estimated	6120	5.92	0.11				TONS	add
PM2.5 Primary (includes filterables + condensibles)	Time-based factor - Estimated	6120	5.92	0.11				TONS	add
CO - Carbon Monoxide	Throughput-based factor	6120	0.6		0	0.18		TONS	add
NOx - Nitrogen Oxides	Throughput-based factor	6120	11		0	3.3		TONS	add
SO2 - Sulfur Dioxide	Throughput-based factor	6120	1.4		0	0.42		TONS	add
VOC - Volatile Organic Compounds	Throughput-based factor	6120	0.2		0	0.06		TONS	add
Ammonia	Throughput-based factor	6120	0					TONS	add

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ation was developed using (Arizona) DEQ-generated pollutant emission calculations. The values may be provided to USEPA by the (Arizona) DEQ. You may modify these (Arizona) DEQ-generated emission calculations if you have more acc

Hazardous Air Pollutants/Greenhouse Gases/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)	Time-based Factor (LBS/Hour)	Emissions Reported			Units	Explanation
					Fugitive Amount	Stack Amount	Total		
Select Pollutant									

Add Emission Delete Selected Emission(s) Printable view Export to excel

Save Cancel

¹ Reference: MCAQD, 2016. Technical Support Document for the General Permit to Operate and/or Construct a Crematory, Revision 0.0.0.0.

Step 5

Refer to other process specific help sheets or the Emissions Inventory Instructions to report emissions from other types of processes at the facility. When emissions have been reported for each process, refer to Task 5 on page 26 of the Emissions Inventory Instructions to validate and submit the emissions inventory. The process specific help sheets and the Emissions Inventory Instructions are available at maricopa.gov/5628.

Example

Emissions from cremation

▼ PRC001: Source Classification Code (SCC) is 3-15-021-03

SCC Level 1: 3:Industrial Processes
 SCC Level 2: 15:Photo Equip/Health Care/Labs/Air Condit/SwimPools
 SCC Level 3: 021:Health Care - Crematoriums
 SCC Level 4: 03:Cremation - Human

Process Name:
 Company Process Description: Human Cremation

▼ Material Information, Annual Average Operating Schedule & Throughput Percent

Maximum Hours Per Day: 24	Winter (Jan-Feb, Dec)%: 15
Maximum Days Per Week: 7	Spring (Mar-May)%: 20
Maximum Weeks Per Year: 52	Summer (Jun-Aug)%: 45
Actual Hours: 6,120.00	Fall (Sep-Nov)%: 20

Material Action Throughput Confidential Units
 Remains Burned 600 TONS

Variable Amount in Remains Units & Meaning
 The variables table is empty because there are no variables in the formula associat

▶ Explanation

▶ Explanation

Edit Material/Schedule/Seasons

▼ Process Emissions

Criteria Air Pollutants/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)	Time-based Factor (LBS/Hour)	Emissions Reported			Units	Exp
					Fugitive Amount	Stack Amount	Total		
PM Primary (includes filterables > 10 microns + condensibles)	Time-based factor - Estimated Uncontrolled factor input by user.	6120	5.92	0.11	0	0.3366	0.3366	TONS	
PM10 Primary (includes filterables + condensibles)	Time-based factor - Estimated Uncontrolled factor input by user.	6120	5.92	0.11	0	0.3366	0.3366	TONS	
PM2.5 Primary (includes filterables + condensibles)	Time-based factor - Estimated Uncontrolled factor input by user.	6120	5.92	0.11	0	0.3366	0.3366	TONS	
CO - Carbon Monoxide	Throughput-based factor Available factors: 1	6120	0.6		0	0.18	0.18	TONS	
NOx - Nitrogen Oxides	Throughput-based factor Available factors: 1	6120	11		0	3.3	3.3	TONS	
SO2 - Sulfur Dioxide	Throughput-based factor Available factors: 1	6120	1.4		0	0.42	0.42	TONS	
VOC - Volatile Organic Compounds	Throughput-based factor Available factors: 1	6120	0.2		0	0.06	0.06	TONS	
Ammonia	Throughput-based factor Uncontrolled factor input by user.	6120	0		0	0	0	TONS	

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Questions

If you have questions or are experiencing issues with the AQD Online Portal, please contact 602-506-6790 or EmissionsInventory@maricopa.gov. Please provide a brief explanation of the question or problem you are encountering and include a screenshot if contacting us via email. If you are encountering errors or malfunctions in the portal, include the following information in your message: the date and time when the error occurred, the browser you were using when the error occurred, and the type of device you were using when the error occurred (i.e., computer, tablet, phone, etc.).

Additional Resources

How to create a Shared CROMERR Services (SCS) electronic signature to access the AQD Online Portal: maricopa.gov/DocumentCenter/View/56270

Emissions inventory instructions and other process specific help sheets:
maricopa.gov/5628

Instructions for permit applications, compliance reports, asbestos notifications, performance test protocols, and other documents that can be submitted through the AQD Online portal:
maricopa.gov/1820