



Leveraging the IMPACT Database to Improve Emissions Reporting

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Maricopa County

STATISTICS

- 9,224 square miles
- 4.4 million residents
- Fastest growing county in the United States
- 160 new permitted stationary sources in FY2023
- Approximately 500 emissions inventories (EI) per year

FACILITIES IN OPERATION

Facility Type	Number
Title V	29
Non-Title V	3,812
Dust (Construction)	3,443
Open Burn	20

Emissions Reporting Challenges

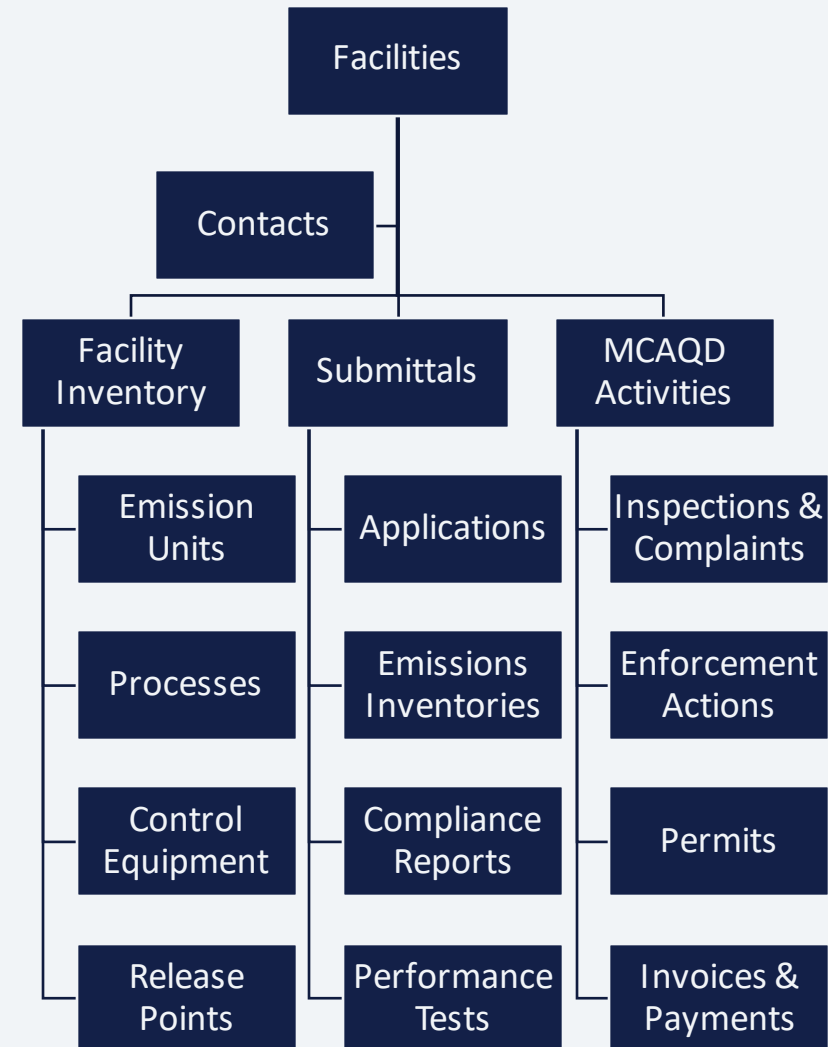
LEGACY DATABASE – EMISSIONS MANAGEMENT SYSTEM (EMS)

- Database areas were disconnected
 - Permitting – Equipment List (Emission Units and Controls)
 - Emissions Inventory – Emission Processes, Controls, and Release Points
- Staff spent months entering data from paper forms into the emissions inventory database
- Database was outdated and database upgrades were infeasible

The IMPACT Database

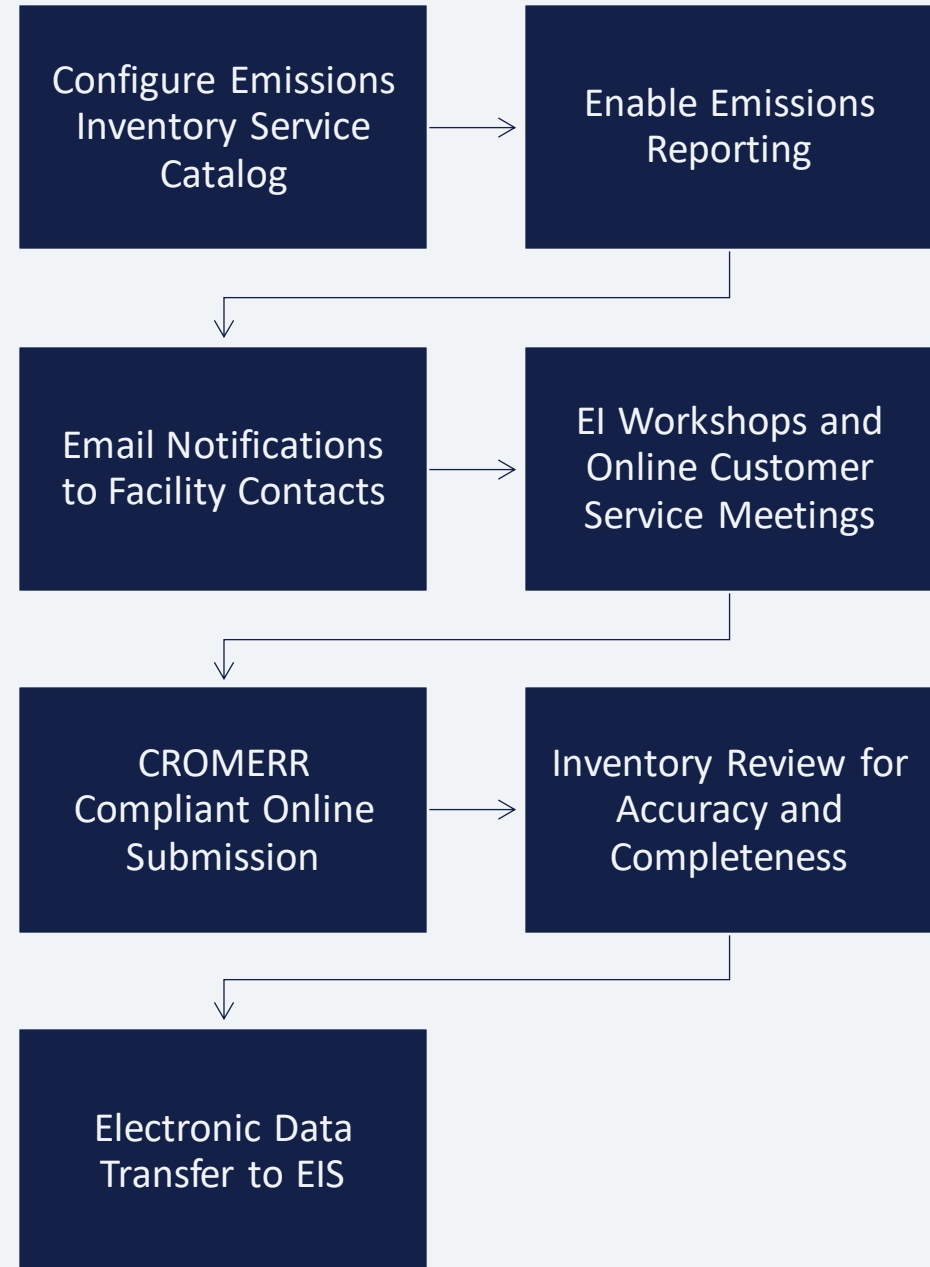
INVENTORY, MONITORING, PERMITTING,
AND COMPLIANCE TRACKING

- Facilities are the core.
- Submittals and MCAQD activities are linked to facilities.
- Each application and emissions inventory is linked to a specific version of the facility inventory.
 - Versioning allows for tracking of facility changes over time.



IMPACT EI Process

- Inventory settings are configured for each reporting period.
- Notification emails are sent automatically.
- Emission factors can be prepopulated.
- Staff time is focused on customer service and inventory review instead of data entry.





IMPACT Emissions Reporting Improvements

Connected Modules

Permit

- Control equipment is reviewed when permit actions occur.

Test

- Control efficiency and/or emission factors are verified by performance testing.

Report

- Control efficiency or emission factors from performance tests are utilized for emissions reporting.

Connected Modules

EMISSION UNIT

Emissions Unit Information

AQD ID: COT001 [View Emission Unit](#)

Emission Unit Type: Spray Booth or Coating Line [Help me select](#)

AQD Description: Paper Coating Line

Company Equipment ID: 287248

Company Equipment Description: Paper Coating Line

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: 11/20/2015

Initial Operation Commencement Date: 11/20/2015

Most Recent Construction/Modification Commencement Date: 11/20/2015

Most Recent Operation Commencement Date: 11/20/2015

EMISSION PROCESS

Process Information

Process ID: PRC041

Process Name: Printing

Company Process Description: Vented to RTO

Source Classification Code (SCC): 4-05-003-01

SCC Level 1 Description: 4:Petroleum and Solvent Evaporation

SCC Level 2 Description: 05:Printing/Publishing

SCC Level 3 Description: 003:Flexographic

SCC Level 4 Description: 01:Printing

Connected Modules

CONTROL EQUIPMENT

Control Equipment Information

AQD ID: TIN001

Control Equipment Type: Thermal Oxidizer/Thermal Incinerator

AQD Description: Regenerative Thermal Oxidizer

Company Control Equipment ID: RTO1

Company Control Equipment Description: Regenerative Thermal Oxidizer

Operating Status: Operating

Initial Installation Date: 11/20/2015

Manufacturer Name: **Model Name and Number:**

▶ **Control Equipment Type Specific Information**

▼ **Pollutants Controlled**

▶ Explanation

You must specify at least one pollutant in the Pollutants Controlled table

Pollutant	Design Control Efficiency(%)	Operating Control Efficiency(%)	Capture Efficiency(%)	Total Capture Control(%)
VOC - Volatile Organic Compounds	99.9	99.9	100	99.9

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RELEASE POINT

Release Point Information

AQD ID: VER001

Release Point Type: Vertical

AQD Description: RTO Stack

Company Release Point ID: RTO1

Company Release Point Description: RTO Stack

Operating status: Operating

Release Point Latitude: 33.35484 **Facility Latitude:** 33.35484

Release Point Longitude: -111.90175 **Facility Longitude:** -111.90175

[Show On Map](#)

▼ **Release Point Type Specific Information**

Base Elevation (ft): 1100.00
Feet above sea level

Stack Height (ft): 25.00 **Stack Diameter (ft):** 1.50
Feet above base elevation

Exit Gas Velocity (ft/s): 11.77 **Exit Gas Temp (F):** 788.00

Exit Gas Flow Rate (acfm): 1,247.96
Flow rate is calculated by IMPACT:
3.1415927*Velocity*60*(Diameter/2)^2

Connected Modules

EMISSIONS INVENTORY

Material	Action	Throughput	Confidential	Units
Ink	Used	5786.23	<input type="checkbox"/>	TONS

▶ Explanation

Variable Amount in Ink Units & Meaning

The variables table is empty because there are no variables in the formula associated with the FIRE rows for this process.

▶ Explanation

Edit Material/Schedule/Seasons

▶ Performance Test Emissions Factors

▼ Process Emissions

Criteria Air Pollutants/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)	Time-based Factor (LBS/Hour)	Emissions Reported			Explanation
					Fugitive Amount	Stack Amount	Total	
PM Primary (includes filterables > 10 microns + condensibles)	Throughput-based factor Uncontrolled factor input by user.	4567	0		0	0	0 TONS	
PM10 Primary (includes filterables + condensibles)	Throughput-based factor Uncontrolled factor input by user.	4567	0		0	0	0 TONS	
PM2.5 Primary (includes filterables + condensibles)	Throughput-based factor Uncontrolled factor input by user.	4567	0		0	0	0 TONS	
CO - Carbon Monoxide	Throughput-based factor Uncontrolled factor input by user.	4567	0		0	0	0 TONS	
NOx - Nitrogen Oxides	Throughput-based factor Uncontrolled factor input by user.	4567	0		0	0	0 TONS	
SO2 - Sulfur Dioxide	Throughput-based factor Uncontrolled factor input by user.	4567	0		0	0	0 TONS	
VOC - Volatile Organic Compounds	Throughput-based factor Uncontrolled factor input by user. Available factors: 1	0	340		0	0.983659	0.983659 TONS	
Ammonia	Throughput-based factor Uncontrolled factor input by user.	4567	0		0	0	0 TONS	

Consistent Emission Factors

PRE-POPULATED EMISSION FACTORS BY SOURCE CLASSIFICATION CODE

- Uncontrolled emission factors from WebFire and other sources can be pre-populated in the AQD Online Portal.
- A warning is shown if the facility does not use the pre-populated emission factors.
- Facilities can use throughput- or time-based emission factors.

▼ Process Emissions

Criteria Air Pollutants/Other		Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)
Pollutant	Method Used		
PM Primary (includes filterables > 10 microns + condensibles)	Throughput-based factor	7199	7.6
PM10 Primary (includes filterables + condensibles)	Throughput-based factor	7199	7.6
PM2.5 Primary (includes filterables + condensibles)	Throughput-based factor	7199	7.6
CO - Carbon Monoxide	Throughput-based factor Uncontrolled factor input by user.	7199	2.18
NOx - Nitrogen Oxides	Throughput-based factor Uncontrolled factor input by user.	7199	10.69
SO2 - Sulfur Dioxide	Throughput-based factor	7199	0.6
VOC - Volatile Organic Compounds	Throughput-based factor	7199	5.5
Ammonia	Throughput-based factor Uncontrolled factor input by user.	7199	0

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Automatic Calculations

▶ PRC011: Source Classification Code (SCC) is 2-01-002-01

▼ Material Information, Annual Average Operating Schedule & Throughput Percent

Maximum Hours Per Day: 24
 Maximum Days Per Week: 7
 Maximum Weeks Per Year: 52
 Actual Hours: 6,127.83

Winter (Jan-Feb, Dec)%: 29
 Spring (Mar-May)%: 25
 Summer (Jun-Aug)%: 23
 Fall (Sep-Nov)%: 23

Material	Action	Throughput	Confidential	Units
Natural Gas	Burned	8544.29123	<input type="checkbox"/>	MILLION CUBIC FEET

Variable Amount in Natural Gas Units & Meaning	
S	0.00028% Sulfur content by weight
HCg	1034 Gas Heat Content (Btu/Cubic Feet)

▶ Explanation

▶ Explanation

[Edit Material/Schedule/Seasons](#)

▼ Performance Test Emissions Factors

Pollutant	Factor	Unit	Protocol	Comment	Last Modified By	Last Modified Date
Ammonia	0.17	lb/hr	PTPROT000051		Beck, Kristi	8/21/2023
VOC - Volatile Organic Compounds	0.064	lb/hr	PTPROT000051		Beck, Kristi	8/21/2023
PM Primary (includes filterables > 10 microns + condensibles)	2.19	lb/hr	PTPROT000051		Beck, Kristi	8/21/2023

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▼ Process Emissions

Criteria Air Pollutants/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units) / (LBS/Hour)	Time-based Factor	Emissions Reported			Explanation
					Fugitive Amount	Stack Amount	Total Units	
PM Primary (includes filterables > 10 microns + condensibles)	Time-based factor - Stack Test Uncontrolled factor input by user.	6127.83	326.4	2.19	0	6.70997	6.70997 TONS	
PM10 Primary (includes filterables + condensibles)	Time-based factor - Stack Test Uncontrolled factor input by user.	6127.83	326.4	2.19	0	6.70997	6.70997 TONS	
PM2.5 Primary (includes filterables + condensibles)	Time-based factor - Stack Test Uncontrolled factor input by user.	6127.83	326.4	2.19	0	6.70997	6.70997 TONS	
CO - Carbon Monoxide	Time-based factor - CEM Available factors: 1	6127.83	84.788	17.33	0	362.227	362.227 TONS	
NOx - Nitrogen Oxides	Time-based factor - CEM Available factors: 1	0	330.88	13.7	0	41.9756	41.9756 TONS	
SO2 - Sulfur Dioxide	Throughput-based factor Available factors: 1	6127.83	0.272149		0	1.16266	1.16266 TONS	
VOC - Volatile Organic Compounds	Time-based factor - Stack Test Uncontrolled factor input by user. Available factors: 2	6127.83	2.17	0.064	0	0.196091	0.196091 TONS	
Ammonia	Time-based factor - Stack Test Uncontrolled factor input by user.	6127.83	0	0.17	0	0.520866	0.520866 TONS	

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Automatic Calculations

Material Information, Annual Average Operating Schedule & Throughput Percent

Maximum Hours Per Day: 24

Maximum Days Per Week: 7

Maximum Weeks Per Year: 52

Actual Hours: 8,760.00

Winter (Jan-Feb, Dec)%: 25

Spring (Mar-May)%: 25

Summer (Jun-Aug)%: 25

Fall (Sep-Nov)%: 25

Material	Action	Throughput	Confidential	Units
Natural Gas Burned		15	<input type="checkbox"/>	MILLION CUBIC FEET

Variable	Amount in Natural Gas	Units & Meaning
HCg		1020 Gas Heat Content (Btu/Cubic Feet)

Explanation

Explanation

$$15 \text{ MMcf} \times \frac{100 \text{ lb NO}_x}{\text{MMcf}} \times (1 - 0.85) = 225 \text{ lbs NO}_x$$

Performance Test Emissions

Process Emissions

Criteria Air Pollutants/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)	Time-based Factor (LBS/Hour)	Emissions Reported			Explanation
					Fugitive Amount	Stack Amount	Total	
PM Primary (includes filterables > 10 microns + condensibles)	Throughput-based factor Available factors: 1	8760	7.6		0	114	114 POUNDS	
PM10 Primary (includes filterables + condensibles)	Throughput-based factor Available factors: 1	8760	7.6		0	114	114 POUNDS	
PM2.5 Primary (includes filterables + condensibles)	Throughput-based factor Available factors: 1	8760	7.6		0	114	114 POUNDS	
CO - Carbon Monoxide	Throughput-based factor Available factors: 1	8760	84		0	1,260	1,260 POUNDS	
NOx - Nitrogen Oxides	Throughput-based factor Available factors: 1	0	100		0	225	225 POUNDS	
SO2 - Sulfur Dioxide	Throughput-based factor Available factors: 1	8760	0.6		0	9	9 POUNDS	
VOC - Volatile Organic Compounds	Throughput-based factor Uncontrolled factor input by user. Available factors: 2	8760	5.5		0	82.5	82.5 POUNDS	
Ammonia	Throughput-based factor Available factors: 1	8760	0.49		0	7.35	7.35 POUNDS	

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Automatic Calculations

▼ Material Information, Annual Average Operating Schedule & Throughput Percent

Maximum Hours Per Day: 24
 Maximum Days Per Week: 7
 Maximum Weeks Per Year: 52
Actual Hours: 8,760.00

Winter (Jan-Feb, Dec)%: 25
 Spring (Mar-May)%: 25
 Summer (Jun-Aug)%: 25
 Fall (Sep-Nov)%: 25

Material	Action	Throughput	Confidential	Units
Natural Gas	Burned	15	<input type="checkbox"/>	MILLION CUBIC FEET

Variable Amount in Natural Gas Units & Meaning
 HCg 1020 Gas Heat Content (Btu/Cubic Feet)

► Explanation

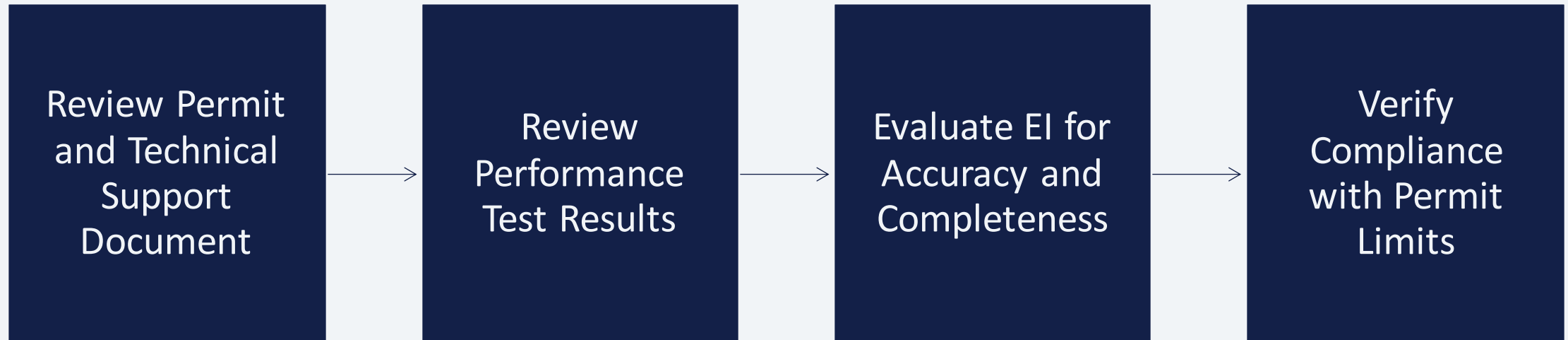
$$\left[\frac{8688}{8760} \times 15 \text{ MMcf} \times \frac{100 \text{ lb NO}_x}{\text{MMcf}} \times (1 - 0.85) \right] + \left[\frac{72}{8760} \times 15 \text{ MMcf} \times \frac{100 \text{ lb NO}_x}{\text{MMcf}} \right] = 235 \text{ lbs NO}_x$$

▼ Process Emissions

Criteria Air Pollutants/Other	Method Used	Hours Uncontrolled	Uncontrolled Emissions Factor (Lbs/Throughput Units)	Time-based Factor (LBS/Hour)	Emissions Reported			Explanation
					Fugitive Amount	Stack Amount	Total	
PM Primary (includes filterables > 10 microns + condensibles)	Throughput-based factor Available factors: 1	8760	7.6		0	114	114 POUNDS	
PM10 Primary (includes filterables + condensibles)	Throughput-based factor Available factors: 1	8760	7.6		0	114	114 POUNDS	
PM2.5 Primary (includes filterables + condensibles)	Throughput-based factor Available factors: 1	8760	7.6		0	114	114 POUNDS	
CO - Carbon Monoxide	Throughput-based factor Available factors: 1	8760	84		0	1,260	1,260 POUNDS	
NOx - Nitrogen Oxides	Throughput-based factor Available factors: 1	72	100		0	235.479	235.479 POUNDS	
SO2 - Sulfur Dioxide	Throughput-based factor Available factors: 1	8760	0.6		0	9	9 POUNDS	
VOC - Volatile Organic Compounds	Throughput-based factor Uncontrolled factor input by user. Available factors: 2	8760	5.5		0	82.5	82.5 POUNDS	
Ammonia	Throughput-based factor Available factors: 1	8760	0.49		0	7.35	7.35 POUNDS	

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Improved Quality Assurance



Online Preparation and Submission

FACILITY REPRESENTATIVES SUBMIT DATA THROUGH THE AQD ONLINE PORTAL

- Facility contacts create Shared CROMERR Service (SCS) Accounts.
 - Preparer or Certifier access
 - Each person creates their own account; multi-user accounts are prohibited
- MCAQD links accounts so contacts can access their facilities in the AQD Online Portal.
- Certifiers use electronic signatures to submit information to MCAQD.
- Each submission creates an IMPACT workflow that is assigned to an MCAQD employee.

Increased Flexibility

MCAQD STAFF CAN UPDATE EMISSIONS INVENTORY PARAMETERS

- Add or remove reportable pollutants
- Change pollutant groupings
- Change list of non-billable pollutants
- Update emissions-based fee
- Calculation methods
- Emission factors
- Source classification codes

Electronic Data Transfer to EPA

UTILIZING VIRTUAL EXCHANGE SERVICES

Emissions
Inventory

EIS

Permitting and
Compliance

ICIS-Air

Increased Transparency

 Version 13.0 | Build ID: 26.94.0

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Emissions Inventory Search

Search Criteria

Facility ID
0000000000, 0%, %0%, *0*, 0*

Facility Name
acme%, %acme%, *acme*, acme*

Inventory ID
EI0000001, EI%, %01% *01*, EI*

Company
This is an autocomplete field. Enter at least the first three characters to see available choices.

Year
Content Type
Regulatory Requirement

From Received Date 
To Received Date 

Range: [,] TONS
25, 25.3, 2.53E1, 95, 95.3, 9.53E1

Pollutant
Pollutant dropdown list is populated based on the pollutants in submitted emissions inventories. When a pollutant is selected, search results include submitted inventories only.

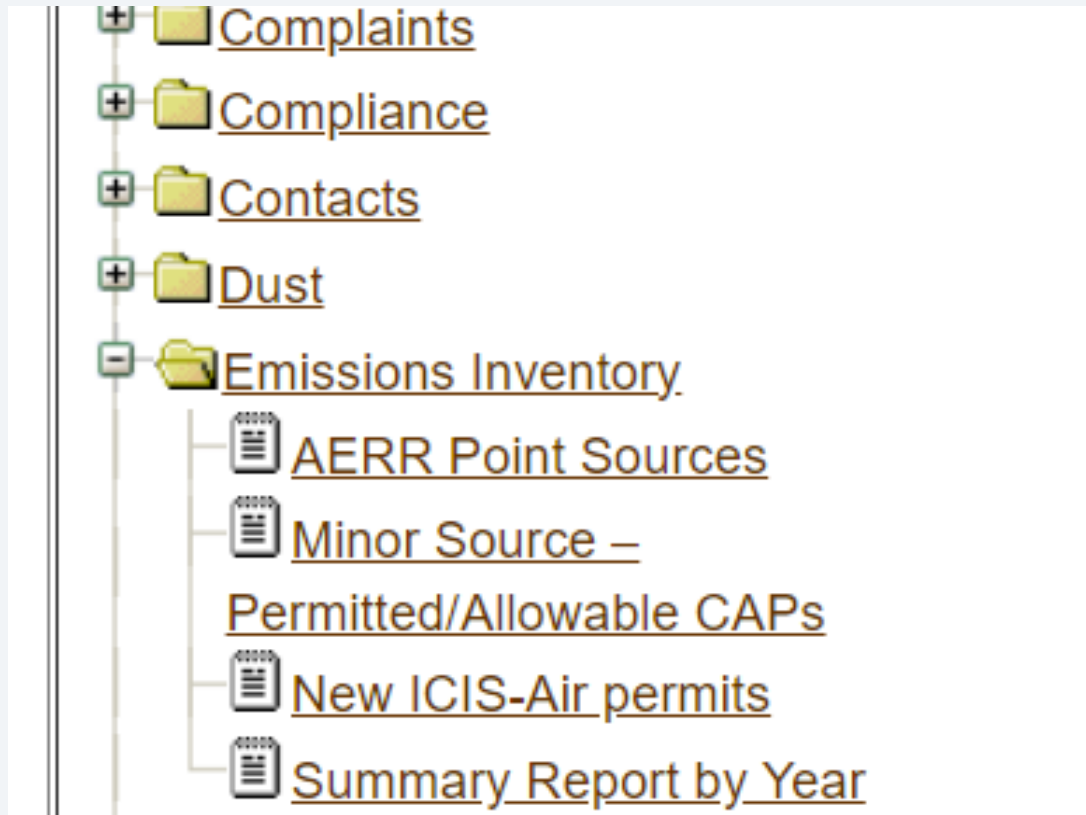
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Air Quality Department
301 W. Jefferson St., Suite 410
Phoenix, AZ 85003
Phone: 602-506-6010

For technical assistance contact AQDImpact@maricopa.gov or 602-506-7833

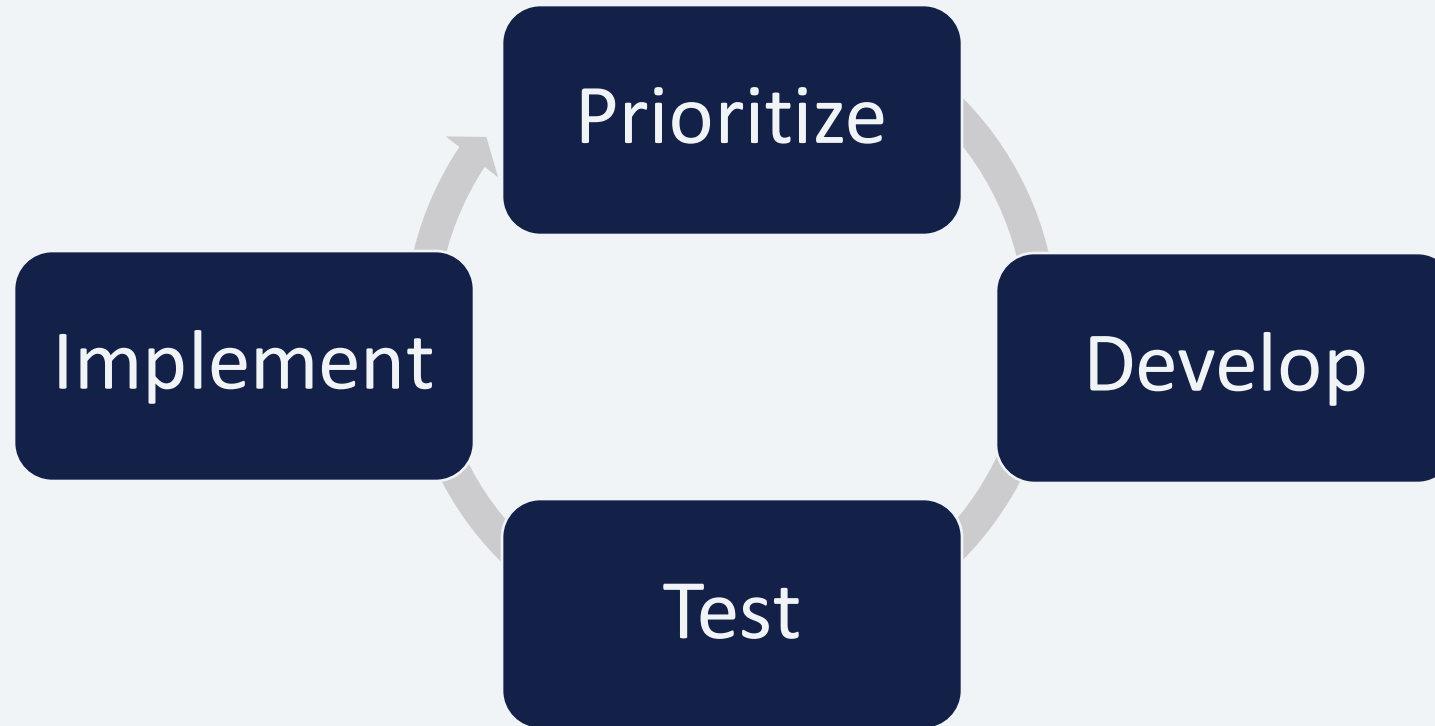
New Reporting Tools



- Reports written in SQL
- MCAQD Database Administrator loads SQL into IMPACT
- MCAQD staff can run reports as needed

Ability to Update and Enhance

ENHANCEMENTS IMPLEMENTED QUARTERLY



Contact Information

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DIGITAL BUSINESS CARD





Thank You