TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT No. 83009

I. INTRODUCTION

This Class II synthetic minor air quality permit renewal is for the continued operation of a medical cannabis greenhouse production facility. The facility is located at 650 N Industrial Drive, Snowflake, AZ 85937. Permit No. 83009 renews and supersedes Permit No. 61747.

A. Company Information

Facility Name:	Copperstate Farms Management, LLC - Snowflake Facility
Mailing Address:	650 N Industrial Drive, Snowflake, AZ 85937
Facility Location:	650 N Industrial Drive, Snowflake, AZ 85937

B. Attainment Classification

The facility is located in Navajo County. This area that is in attainment for all the criteria air pollutants.

II. PROCESS DESCRIPTION

A. Process Equipment

Copperstate Farms Management, LLC - Snowflake Facility is a medical cannabis greenhouse production facility. The facility has one greenhouse, Site #7, consisting of three (3) boilers, four (4) emergency generators, and two (2) sulfuric acid tanks.

The boilers are used to regulate the temperature of the greenhouses and provide additional carbon dioxide to optimize the growth of the crops. All the boilers at the facility are capable of being fired by natural gas or diesel. The boilers can only burn liquid fuel (diesel fuel) during periods of gas curtailment, gas supply emergencies or periodic testing on liquid fuel. The generators at the facility are used to provide power in emergency situations and power outages. These generators use diesel fuel. The sulfuric acid tanks are used for storage of sulfuric acid. Sulfuric acid provides water conditioning for improved water penetration and nutrient absorption for the crops.

B. Process Flow Diagram

A flow chart for the process is displayed in Figure 1 below. Generators #3 and #4 are mounted on 1,388-gallon diesel base tanks.

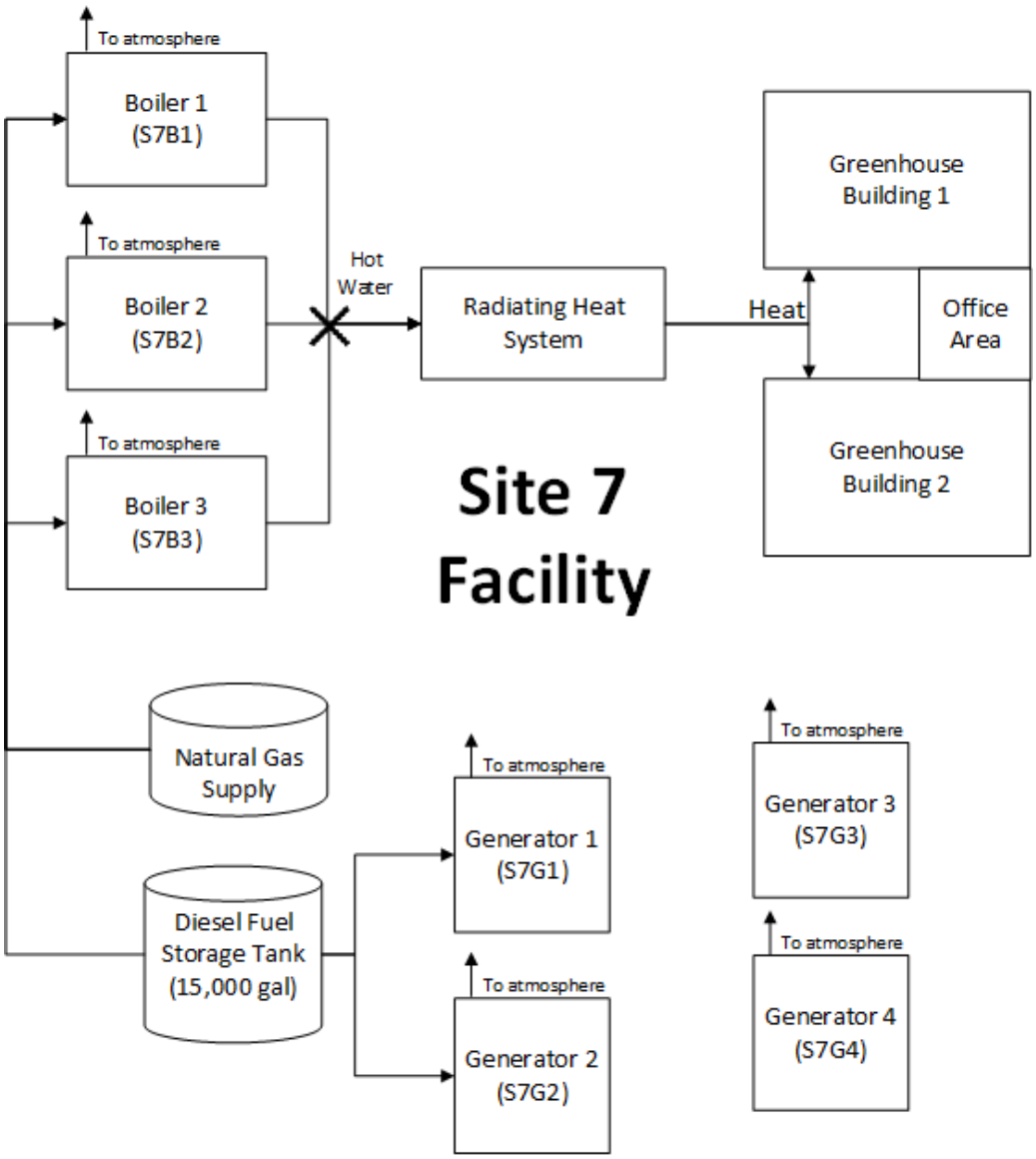

Figure 1 - Flow Chart Adapted from Copperstate Farms Renewal Application

III. LEARNING SITE EVALUATION

This permit renewal will not result in an increase in emissions as there are no changes to any equipment. Hence, the facility is exempt from the learning sites evaluation.

IV. COMPLIANCE HISTORY

Copper State Farms was inspected two (2) times during the last permit term. No inspections resulted in any violations of the permit, or resulted in a Notice of Violation (NOV) or a Notice of Opportunity to Correct (NOC). The dates of inspection were March 9, 2016 and October 25, 2017.

During the last permit term, the facility has submitted eight (8) semiannual compliance certifications to the Arizona Department of Environmental Quality (ADEQ) certifying compliance

with the permit. In addition to this, the facility has submitted four (4) Fuel Certification Reports. No deficiencies have been noted in these reports.

The facility has also submitted two (2) Permit Deviations. The permit deviations were for fuel certifications which were requested by the facility, but not provided from the vendor. No deficiencies were noted in these reports.

During the compliance period, the facility conducted two (2) performance tests on January 7, 2018 and January 7, 2020. The emission limit of 0.0611 lb/MMBtu NO_X was not exceeded during these tests. No deficiencies were noted during the report review.

Table 1: Performance Test Results

Emission Unit	Pollutant	Date of Test	Results of Performance Test
Boiler 3 (S7B3)	NO_X	01/07/2018	PASS 0.0376 lb/MMBtu
Boiler 3 (S7B3)	NO_X	01/17/2019	PASS 0.0356 lb/MMBtu
Boiler 1 (S7B1)	NO_X	01/07/2020	PASS 0.0310 lb/MMBtu.

V. EMISSIONS

Copperstate Farms Management, LLC - Snowflake Facility has the potential-to-emit (PTE) nitrogen oxides (NO_X), particulate matter nominally less than 10 micrometers (PM_{10}), particulate matter nominally less than 2.5 micrometers ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic compounds (VOC), hazardous air pollutant (HAP), and greenhouse gases (GHG).

A. Boilers

The boilers are permitted to burn pipeline quality natural gas for up to 8,760 hours per year. The PTE emission calculations are based on maximum potential fuel combustion in all three boilers for all hours of the year. The Permit only allows the boilers to burn liquid fuel (diesel fuel) during periods of gas curtailment, gas supply emergencies or periodic testing on liquid fuel. The boiler PTE emissions while burning diesel fuel are based on 300 hours of operation per year for each boiler.

1. Natural Gas

The emissions of NO_X were calculated using the emission limit in Condition B. II.E.1 as the emission factor. Emission factors from AP- 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (AP-42), Chapter 1.4 – Natural Gas Combustion were used to calculate emissions of PM_{10}, $PM_{2.5}$, CO, SO_2, and VOC. The natural gas heat content of 1,050 British thermal units per standard cubic foot (Btu/scf) was used.

2. Diesel

Boiler emissions from combustion of diesel fuel were based on emission factors from AP- 42, Chapter 1.3 – Fuel Oil Combustion for distillate oil or No. 2 fuel oil fired boilers rated less than 100 MMBtu/hr. Particle size distribution data in AP-42 Table 1.3-6 for uncontrolled industrial boilers firing distillate oil was used to calculate emission factors for uncontrolled $PM_{2.5}$ and PM_{10}. The SO_2 emission factor in AP-42 Chapter 1.3 depends on the sulfur content of the fuel oil being burned (up to 0.5 weight percent per Attachment "B", Condition II.D.1.a). The emission factor for uncontrolled VOC was assumed to be equal to the emission factor in AP-42 Table 3.4-1 for non-methane total organic compounds (TOC).

B. Engines

1. Generators #1 and #2

Emission factors from AP-42 Chapter 3.4 – Large Stationary Diesel Engines were used to calculate the uncontrolled emissions for NO_X, PM_{10}, $PM_{2.5}$, CO, and HAPs. The uncontrolled PM_{10} and $PM_{2.5}$ emissions factors are calculated using the particle size data in AP-42 Table 3.4-2. The SO_2 emission factor in Table 3.4-1 depends on the sulfur content of the fuel oil being burned (up to 0.9 weight percent per Attachment "B", Condition III.B.3.a(2)). The TOC emission factor in AP-42 Table 3.4-1 was used to calculate the uncontrolled VOC emission factor, specifying that 91% of the TOC emission factor is non-methane.

2. Generators #3 and #4

The emission limits in Attachment "B", Condition III.D.4 were used as emission factors when calculating emissions for PM, CO, and NO_X+ NMHC (non-methane hydrocarbons). The permitted emission rates were used to calculate PM and CO emissions. The PM_{10} and $PM_{2.5}$ emissions were assumed to be equal to the PM emissions for the new generator engines. The uncontrolled VOC emission factor is calculated using the TOC emission factor in AP-42 Table 3.4-1, specifying that 91% of the TOC emission factor is non-methane. The NO_X emission factor was calculated by subtracting the VOC emission factor from the emission factor for NO_X+NMHC.

C. HAPs

HAP emissions from natural gas combustion in the boilers were estimated using emissions factors from AP-42 Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion; and Table 1.4-4, Emission Factors for Metals from Natural Gas Combustion. Calculations for boiler HAP emissions are based only on natural gas combustion. HAP emissions from diesel fuel combustion in the generator engines were estimated using emissions factors from AP-42 Table 3.4-3, Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines; and Table 3.4-4, PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines.

D. GHG

Calculations for boiler greenhouse gas emissions are based only on natural gas combustion. The engine greenhouse gas emission calculations are based on diesel-fuel combustion. The greenhouse gases that are considered in the calculations are Carbon Dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O).

The emission factors from 40 CFR 98 Subpart C Table C-1 – Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel were used to calculate CO_2 emissions. The emission factors from Table C-2 – Default CH_4 and N_2O Emission Factors for Various Types of Fuel were used to calculate CH_4 and N_2O emissions. The Global Warming Potentials (GWP) contained in Table A-1 to Subpart A of Part 98 – Global Warming Potentials were used to convert CO_2, CH_4, and N_2O to Carbon Dioxide Equivalent (CO_2e).

The facility has a potential-to-emit more than the significant thresholds of NO_X. The facility's PTE in tons per year (tpy) is provided in Table 2 below:

Table 2: Potential to Emit (tpy)

Pollutant	Emissions (tpy)	Significant Thresholds
NO_X	41.46	40
PM_{10}	3.48	15
$PM_{2.5}$	2.64	10
CO	39.25	100
SO_2	0.87	40
VOC	2.82	40
HAPs	0.78	10 (single)/ 25 (combined)
GHG (CO_2e)	45,452	75,000

VI. MINOR NEW SOURCE REVIEW (NSR)

This permit renewal application does not propose to make any changes that would increase potential to emit in excess of the permitting exemption thresholds. As a result, minor NSR does not apply.

VII. VOLUNTARILY ACCEPTED EMISSION LIMITATIONS AND STANDARDS

The permit contains the following voluntary emission limitations and standards:

A. Boilers - Fuel Limitation

The facility has accepted a voluntary fuel limitation to use pipeline quality natural gas in the boilers to avoid classification as a major source. The permit allows the facility to burn liquid fuel (diesel) during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. This limitation was incorporated into Renewal Permit No. 61747, issued in 2015.

B. Boilers - Nitrogen Oxides (NO_X)

The facility has accepted a voluntary emission limit of 0.0611 lbs/MMBtu of NO_X and a condition to maintain, and operate low-NOx burners on the boilers to avoid classification as a major source. These limitations were incorporated into Permit No. 52004, issued in 2010 when the facility transitioned from a General Permit to an individual Class II Permit.

VIII. APPLICABLE REGULATIONS

Table 3 identifies applicable regulations and verification as to why that standard applies. The table also contains a discussion of any regulations the emission unit is exempt from.

Table 3: Applicable Regulations

Unit & year	Control Device	Rule	Discussion
Boilers	Low NO_X Burners	New Source Performance Standards (NSPS) 40 CFR Subpart Dc	NSPS Subpart Dc is applicable to boilers with capacity between 10 to 100 MMBtu/hr, and manufactured after June 1989. The rated capacity of the boilers is varying from 30 to 35 MMbtu/hr. The boilers have been manufactured in the years 1997 and 1998. Therefore NSPS Subpart Dc is applicable to these boilers.
		National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart JJJJJJ	NESHAP Subpart JJJJJJ defines "Gas-fired boiler" as any boiler that burns gaseous fuels not combined with any solid fuels, and burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. The boilers at the facility shall be using liquid fuel only in the event of curtailment of natural gas supply. Therefore NESHAP Subpart JJJJJJ is not applicable.

Table 3: Applicable Regulations

Unit & year	Control Device	Rule	Discussion
Internal Combustion Engines	None	(Arizona Administrative Code) A.A.C. R18-2-719	Applicability date for NSPS Subpart IIII is April 1, 2006 for compression ignition engines. The ICEs at the facility are manufactured before this date and NSPS Subpart IIII is not applicable. Engines not subject to Subpart IIII are subject to Existing Stationary Rotating Machinery standards under A.A.C. R18-2-719. Therefore A.A.C. R18-2-719 is applicable to the ICEs.
		NERSHAP Subpart ZZZZ	These engines are existing ICEs at an area source for HAPS and NESHAP Subpart ZZZZ is applicable.
		NSPS Subpart IIII	The engines that commence construction after July 11, 2005 and are either manufactured after April 1, 2006 (and are not fire pump engines) or are manufactured after July 1, 2006 and are fire pumps are subject to New Source Performance Standards (NSPS) 40 CFR 60 Subpart IIII.
Sulfuric Acid Tanks	None	A.A.C. R18-2-730	These standards apply to unclassified sources.
Fugitive dust sources	Water Trucks, Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources at the facility.
Abrasive Blasting	Wet blasting; Dust collecting equipment; Other approved methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	These standards are applicable to any spray painting operation.
Demolition / renovation Operations	N/A	A.A.C. R18-2-1101.A.8	This standard is applicable to any asbestos related demolition or renovation operations.

IX. PREVIOUS PERMIT REVISIONS AND CONDITIONS

A. Previous Permit Revisions

Table 4 provides a description of the permit revisions made to Permit No. 61747 during the previous permit term.

Table 4: Permit Revisions to Permit No. 61747

Permit Revision No.	Permit Revision Type	Brief Description
64854	Permit Transfer	Permit transfer from Naturesweet USA, LLC to Copperstate Farms Management, LLC.
77671	Class II Minor Permit Revision	This permit revision added two (2) new emergency generators at the facility and removed two (2) sulfurous acid generators.

B. Changes to Current Renewal

Table 5 addresses the changes made to the sections and conditions from Permit No. 61747:

Table 5: Previous Permit Conditions

Section No.	Determination		Comments
	Revised	Deleted	
Att. "A"	X		General Provisions: Revised to represent the most recent template language
Att. "B" Section I	X		Facility Wide Requirements: Revised to represent the most recent template language
Att. "B" Section II	X		Boilers: Visible emission protocol has been removed and replaced with a reference to Condition I.A.2 of Attachment "B".
Att. "B" Section III	X		Emergency Internal Combustion Engines (ICEs): • Visible emission protocol has been removed and replaced with a reference to Condition I.A.2 of Attachment "B". • Sections of 40 CFR 63 Subpart ZZZZ have been reorganized and expanded for greater clarity. • Incorporated the requirements from Section VIII for the generators subject to 40 CFR 60 IIII. • Sections of 40 CFR 60 Subpart IIII have been reorganized and expanded for greater clarity.

Table 5: Previous Permit Conditions

Section No.	Determination		Comments
	Revised	Deleted	
Att. "B" Section IV	X		Sulfuric Acid Tanks: Visible emission protocol has been removed and replaced with a reference to Condition I.A.2 of Attachment "B".
Att. "B" Section V	X		Fugitive Dust Requirements: Revised to represent the most recent template language.
Att. "B" Section VI	X		Other Periodic Activities: Revised to represent the most recent template language.
Att. "B" Section VII		X	Mobile Source Requirements: Removed from permit because it did not apply to the facility.
Att. "B" Section VIII		X	Requirements For New Emergency Generators: Applicable requirements were moved to Section III.

X. MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

Table 6 contains an inclusive but not an exhaustive list of the monitoring, recordkeeping and reporting requirements prescribed by the air quality permit. The table below is intended to provide insight to the public for how the Permittee is required to demonstrate compliance with the emission limits in the permit.

Table 6: Permit No. 83009

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
Boilers (S7B1, S7B2, S7B3)	PM	20% opacity (6-minute average) Except for one 6-minute period per hour of not more than 27% opacity	When firing diesel fuel, conduct monthly opacity monitoring of the stacks of all boilers.	For each performance test conducted using Method 9 keep records including the information in Condition II.C.2.b of Attachment "B". Maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the boilers	Submit excess emission reports in accordance with Section XII of Attachment "A" and maintain records according to the requirements specified in Condition II.C.2.b of Attachment "B".
	SO_2	Burn only pipeline quality natural gas. *Note: During periods of gas curtailment, gas supply emergencies, or periodic testing liquid fuel can be burned.*		Record and maintain records of the amount of each fuel combusted during each calendar month.	If the boilers were operating in the reporting period, submit semi-annual reports to the Director by May 15th for the reporting period October 1st to March 31st and by November 15th for the reporting period April 1st to September 30th.

Table 6: Permit No. 83009

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
		When firing diesel fuel, burn only diesel fuel containing equal to or less than 0.5 weight percent sulfur, (on a 30-day rolling average basis)		When firing diesel fuel, the initial performance test shall consist of the fuel certification from the fuel supplier, containing the information described in Conditions II.D.2.b of Attachment "B"	
				Maintain all records required under Section II of Attachment "B" for a period of two years following the date of such record	
	NO_X	0.0611 lbs/MMBtu	Conduct an annual performance test (use EPA Reference Method 7 or 7E) for NOx on the stack of one boiler to demonstrate compliance with the emission limit. Performance test will not be required if the facility is in care and maintenance mode at the time that the test is normally performed		

Table 6: Permit No. 83009

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
Engines (subject to state regulations) (S7G1, S7G2)	PM	40% opacity – for any period greater than 10 seconds	Conduct periodic opacity monitoring on a monthly basis.	Keep records of fuel supplier certifications.	
	SO_2	1.0 lb/MMBtu		Record the daily sulfur content of the fuel used in the engines.	Report to the Director any daily period which the sulfur content exceeds 0.8%.
Engines (subject to ZZZZ) (S7G1, S7G2)	HAPs			Keep the records to show continuous compliance with each emission or operating limitation.	Submit an annual report for the engines. The report must contain the information in Condition III.C.6.a(1) of Attachment "B".
				Keep records of the maintenance on the ICE in order to demonstrate compliance with the operation and maintenance requirements.	
				Keep records of the hours of operation of the engines recorded through the non-resettable hour meter - emergency operation.	
				Keep records of the parameters that are analyzed and the results of the oil analysis, if any, and the oil changes for the engine.	

Table 6: Permit No. 83009

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
Engines (subject to IIII) (S7G3, S7G4)	PM	Opacity: • 20% during the acceleration mode; • 15% during the lugging mode; and • 50% during peaks in either the acceleration or lugging mode.		Keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter.	
		0.20 g/kW-hr			
	CO	3.5 g/kW-hr		Maintain a copy of engine certifications or other documentation demonstrating that each engine complies with the applicable standards.	
	NOx + NMHC	6.4 g/kW-hr			
Sulfuric Acid Tanks	PM	20% Opacity	A Method 9 observer is required to conduct a monthly survey of visible emissions.		
Fugitive Dust	PM	40% Opacity	A Method 9 observer is required to conduct a monthly survey of visible emissions.	Record of the dates and types of dust control measures employed, and if applicable, the results of any Method 9 observations, and any corrective action taken to lower the opacity of any excess emissions.	

Table 6: Permit No. 83009

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
Abrasive Blasting	PM	20% Opacity		Record the date, duration and pollution control measures of any abrasive blasting project.	
Spray Painting	VOC	20% Opacity Control 96% of the overspray		Maintain records of the date, duration, quantity of paint used, any applicable MSDS, and pollution control measures of any spray painting project.	
Demolition/ Renovation	Asbestos			Maintain records of all asbestos related demolition or renovation projects including the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents	

XI. LIST OF ABBREVIATIONS

A.A.C. ..... Arizona Administrative Code
ADEQ ..... Arizona Department of Environmental Quality
Btu/scf ..... British Thermal Units per Standard Cubic Foot
CFR ..... Code of Federal Regulations
CH_4 ..... Methane
CO ..... Carbon Monoxide
CO_2 ..... Carbon Dioxide
CO_2e ..... CO_2 equivalent basis
EPA ..... Environmental Protection Agency
g ..... Gram
GHG ..... Greenhouse Gases
GWP ..... Global Warming Potential
HAP ..... Hazardous Air Pollutant
hp ..... Horsepower
hr ..... Hour
kW ..... Kilowatt
NESHAP ..... National Emission Standards for Hazardous Air Pollutants
NMHC ..... Non-Methane Hydrocarbons
NO_X ..... Nitrogen Oxides
N_2O ..... Nitrous Oxide
NOC ..... Notice of Opportunity to Correct
NOV ..... Notice of Violation
NSPS ..... New Source Performance Standards
PM ..... Particulate Matter
PM10 ..... Particulate Matter less than 10 µm nominal aerodynamic diameter
PM2.5 ..... Particulate Matter less than 2.5 µm nominal aerodynamic diameter
PTE ..... Potential to Emit
SO_2 ..... Sulfur Dioxide
TOC ..... Total Organic Compound
TPY ..... Tons per Year
VOC ..... Volatile Organic Compound
yr ..... Year