



**TECHNICAL REVIEW AND EVALUATION  
OF APPLICATION FOR  
AIR QUALITY PERMIT No. 88010**

**I. INTRODUCTION**

This Class I Renewal permit is for the continued operation of NatureSweet USA, LLC's Willcox Facility. Permit No. 88010 renews and supersedes Permit No. 63639.

**A. Company Information**

Facility Name: NatureSweet USA, LLC – Willcox Facility  
Mailing Address: 26050 South NatureSweet Avenue, Willcox, AZ 85643  
Facility Location: 26050 South NatureSweet Avenue, Willcox, AZ 85643

**B. Attainment Classification**

The facility is located in an area that is in attainment for all criteria pollutants.

**II. PROCESS DESCRIPTION**

**A. Process Equipment**

The Willcox Facility is a greenhouse facility that produces tomatoes at six sites. The Standard Industrial Classification (SIC) for the Willcox Facility is food crops grown undercover, SIC Code 0182. Operations at the Willcox Facility require the use of the following emission units in conjunction with the greenhouse buildings:

**1. Boilers**

The Willcox Facility currently has three natural gas (NG)-fired boilers for each greenhouse site. Eight of the 18 boilers are dual-fuel boilers that are capable of using diesel fuel in the event of an interruption to the natural gas supply. The boilers serve two purposes:

- a. To produce hot water to regulate the temperature within the greenhouses to allow year-round crop production; and
- b. To provide additional CO<sub>2</sub> to the greenhouse crops to enhance the photosynthesis process and maximize crop production.

**2. Emergency Generators**

The Willcox Facility currently has two (2) emergency generators for each greenhouse site and one (1) mobile standby emergency generator as a replacement in the event that one of the emergency generators fails. The emergency generators provide power to the greenhouse sites during emergency situations when

commercial power is unavailable. Emissions from the emergency generators are controlled by good operating practices

3. Sulfur Burners

NatureSweet currently operates two sulfur burners at the Willcox Facility but is permitted to install and operate additional burners (one per greenhouse site). The sulfur burners are designed to burn elemental sulfur to generate sulfur dioxide ( $\text{SO}_2$ ) gas, which creates a mild sulfurous acid ( $\text{H}_2\text{SO}_3$ ) when introduced to water. The result is water with reduced pH and alkalinity that increases the availability of nutrients and the ability of the plants to absorb those nutrients. The use of sulfur burners, in lieu of purchased acid, is necessary for organic agriculture.

Each sulfur burner converts elemental sulfur into  $\text{SO}_2$  that subsequently reacts with water at an estimated 99.98%  $\text{SO}_2$  absorption ratio to produce  $\text{H}_2\text{SO}_3$ . The sulfur burning process is initiated with a quick-fire blow torch and burning is self-sustained once commenced.

4. Storage Tanks

NatureSweet utilizes diesel, propane, and gasoline storage tanks at the facility to fuel its vehicles and equipment. Additional storage tanks are used at the facility to supply the nutrients and water treatment additives necessary to support greenhouse operations. With the exception of the gasoline storage tank, each storage tank meets the definition of either an insignificant or a trivial activity.

## B. Process Flow Diagram

The process flow diagram for each the Willcox facilities greenhouse sites is represented in Figure 1 below.

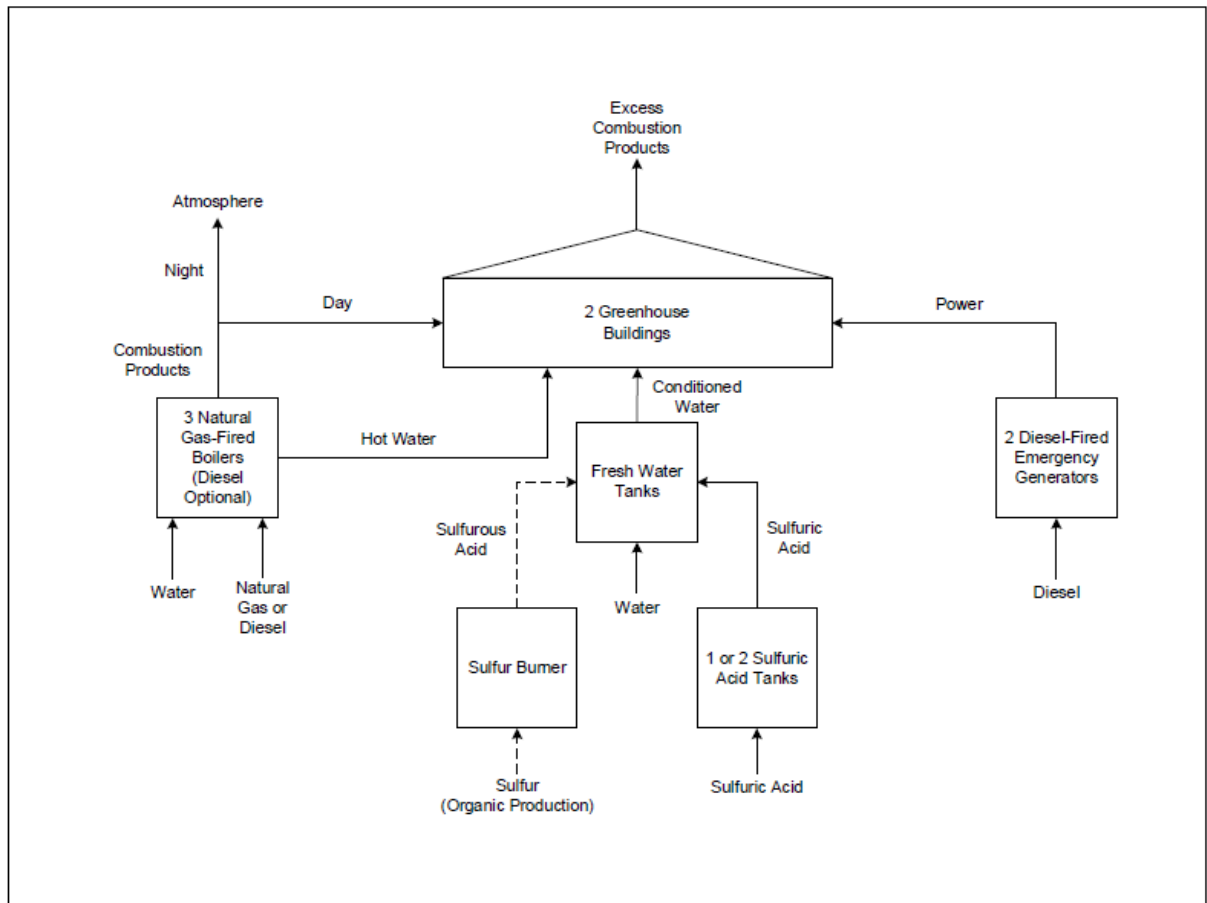


Figure 1: Process Flow Diagram

## III. LEARNING SITE EVALUATION

In accordance with ADEQ's Environmental Permits and Approvals near Learning Sites Policy, the Department is required to conduct an evaluation to determine if any nearby learning sites would be adversely impacted by the facility. Learning sites consist of all existing public schools, charter schools and private schools the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ.

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

#### IV. COMPLIANCE HISTORY

The department has conducted five (5) field inspections and reviewed nine (9) compliance certifications during the permit term for Permit No. 63639. The Permittee has submitted two (2) permit deviations during the permit term. These permit deviations are explained in further detail below.

##### A. Permit Deviations

1. A Permit deviation was submitted on December 23, 2020 for not have a certified Method 9 observer on site or on call. This was caused by classes being cancelled due to COVID-19. The Permittee had staff renew Method 9 certifications on June 2, 2020. No formal enforcement was taken for this permit deviation.
2. A permit deviation was submitted on January 27, 2021 for not having records documenting or performing required monthly visible emissions surveys of fugitive dust sources. The deviation occurred from April of 2020 through December of 2020. The deviation was discovered during the review of the Permittee's compliance certification. The Permittee implemented an internal process that checks for the surveys and had additional staff certified for Method 9 observations. No formal enforcement was taken for this permit deviation.

##### B. Performance Tests

The permittee is required to conduct performance tests on all boilers on site. All of the performance testing conducted during the permit term is shown in Table 1. No performance tests conducted exceeded their applicable emission limit. Eight (8) performance tests were not conducted due to the boiler not operating from the time the test was required.

Table 1: Performance Test Results

Site	Emission Unit	Pollutant	Date of Test	Results of Performance Test (lb/MMscf)	Emission Limit (lb/MMscf)
Site 2	Boiler 1	NO <sub>x</sub>	1/6/2021	50.5	62.32
Site 3	Boiler 3	NO <sub>x</sub>	1/6/2021	38.36	62.32
Site 4	Boiler 3	NO <sub>x</sub>	1/6/2021	56.12	62.32
Site 6	Boiler 3	NO <sub>x</sub>	1/6/2021	53.93	62.32
Site 2	Boiler 3	NO <sub>x</sub>	12/10/2019	34.81	62.32
Site 3	Boiler 2	NO <sub>x</sub>	12/10/2019	38.04	62.32
Site 4	Boiler 2	NO <sub>x</sub>	12/10/2019	43.84	62.32
Site 6	Boiler 2	NO <sub>x</sub>	12/10/2019	36.42	62.32
Site 4	Boiler 1	NO <sub>x</sub>	12/5/2018	32.22	62.32
Site 6	Boiler 1	NO <sub>x</sub>	12/5/2018	33.03	62.32
Site 2	Boiler 2	NO <sub>x</sub>	12/5/2018	49.42	62.32
Site 3	Boiler 1	NO <sub>x</sub>	12/5/2018	40.19	62.32
Site 5	Boiler 5	NO <sub>x</sub>	12/4/2017	43.76	62.32
Site 6	Boiler 6	NO <sub>x</sub>	12/4/2017	43.42	62.32

Site	Emission Unit	Pollutant	Date of Test	Results of Performance Test (lb/MMscf)	Emission Limit (lb/MMscf)
Site 4	Boiler 3	NO <sub>x</sub>	12/4/2017	51.84	62.32
Site 2	Boiler 1	NO <sub>x</sub>	12/4/2017	43.3	62.32
Site 3	Boiler 3	NO <sub>x</sub>	12/4/2017	44.57	62.32
Site 5	Boiler 1	NO <sub>x</sub>	12/5/2016	43.73	62.32
Site 2	Boiler 3	NO <sub>x</sub>	12/5/2016	39.41	62.32
Site 3	Boiler 2	NO <sub>x</sub>	12/5/2016	41.16	62.32
Site 4	Boiler 2	NO <sub>x</sub>	12/5/2016	45.54	62.32
Site 6	Boiler 2	NO <sub>x</sub>	12/5/2016	38.73	62.32

## V. EMISSIONS

### A. Facility-Wide

The PTE for the facility was calculated using AP-42 emission factors, performance testing results, and permitted emission limits.

The facility has a potential-to-emit (PTE) more than the major source thresholds of NO<sub>x</sub>. The facility's PTE is provided in Table 2 below:

**Table 2: Facility-Wide Potential to Emit (tpy)**

Pollutant	Previous Emissions	Change in Emissions	Emissions	Permitting Exemption Threshold	Minor NSR Triggered?
NO <sub>x</sub>	163.65	0.00	163.65	20	No
PM <sub>10</sub>	13.23	0.00	13.23	7.5	No
PM <sub>2.5</sub>	12.20	0.00	12.20	5	No
CO	25.52	0.00	25.52	50	No
SO <sub>2</sub>	1.06	0.00	1.06	20	No
VOC	8.04	0.00	8.04	20	No
Pb	0.002	0.00	0.002	0.3	No
Greatest Single HAP (Hexane)	1.85	0.00	1.85	N/A	N/A
HAPs (Total)	2.07	0.00	2.07	N/A	N/A
GHG (CO <sub>2</sub> e)	141,919	0.00	141,919	--	N/A

**B. Source within a Source**

Prevention of Significant Deterioration (PSD) defines a major source as a facility with the potential to emit 100 tpy for a categorical source and 250 tpy for a non-categorical source.

Boilers, which are a support activity for growing greenhouse food crops, are a listed categorical source if there is more than 250 million Btus per hour (MMBtu/hr) heat input. The Willcox facility has a combined 724.24 MMBtu/hr. Therefore, the PSD limit for the boilers is 100 tpy. To stay below 100 tpy of NO<sub>x</sub>, the Permittee voluntarily accepted three permit conditions: an annual limit on the natural gas usage in the boilers; a NO<sub>x</sub> emission limit while burning natural gas; and an hourly limit that the boilers can operate while burning diesel fuel.

However, the primary activity at the Willcox facility is growing greenhouse food crops which is not a listed categorical source, thus is a non-categorical source. Therefore the PSD limit for growing greenhouse food crops is 250 tpy. To stay below the major source threshold of 250 tpy of NO<sub>x</sub>, in addition to the limits taken on the boilers mentioned above, the Permittee voluntarily accepted an annual limit on the number of hours the internal combustion engines cumulatively can operate. Consequently, the NatureSweet USA, LLC facility as a whole is not a PSD major source.

The facility's PTE from the categorical boilers is provided in Table 3 below:

**Table 3: Categorical Source Potential to Emit (tpy)**

<b>Pollutant</b>	<b>Boiler Emissions from (latest permitting action)</b>	<b>Change in Emissions</b>	<b>Emissions</b>
NO <sub>x</sub>	91.14	0.00	91.14
PM <sub>10</sub>	10.92	0.00	10.92
PM <sub>2.5</sub>	9.89	0.00	9.89
CO	8.91	0.00	8.91
SO <sub>2</sub>	0.91	0.00	0.91
VOC	5.91	0.00	5.91
Pb	0.002	0.00	0.002
Greatest Single HAP (Hexane)	1.85	0.00	1.85
HAPs (Total)	2.03	0.00	2.03
GHG (CO <sub>2</sub> e)	138,779	0.00	138,779

**VI. MINOR NEW SOURCE REVIEW (NSR)**

Minor new source review is required if the emissions of any physical change or change in the method of an operation of an emission unit or stationary source that increases the PTE of any regulated minor NSR pollutant by an amount greater than the permitting exemption threshold (PET) in Table 2 above. This renewal does not physically change or result in a change in the method of operation of the facility that would increase the PTE. Thus, the facility is not subject to minor NSR requirements.

**VII. VOLUNTARILY ACCEPTED EMISSION LIMITATIONS AND STANDARDS**

The permit contains the following voluntary emission limitations and standards:

**A. Fuel Usage Limitation**

1. The facility has accepted a voluntary emission standard to only burn natural gas and diesel fuel in the boilers.
2. The facility has accepted a voluntary emission standard to limit natural gas usage to 2,050 million standard cubic feet (SCF) in any 12-month rolling period.

**B. Operational Limitation**

1. The facility has accepted a voluntary emission standard to limit diesel usage to in the boilers to a cumulative 9,000 hours in any rolling 12-month period.
2. The facility has accepted a voluntary emission standard to limit the hours of operation of the emergency engines to a cumulative 6,042,750 hp-hrs hours in any rolling 12-month period.

**C. NO<sub>x</sub> Emission Limit**

1. The facility has accepted a voluntary emission limit from all boilers to 62.32 pounds per million SCF of natural gas.

These voluntarily accepted emission limitations and standards were taken to avoid classification as a PSD source.

**VIII. APPLICABLE REGULATIONS**

Table 4 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 4: Applicable Regulations**

Unit & year	Control Device	Rule	Discussion
Boilers	Low-NO <sub>x</sub> Burners	<p>NSPS 40 CFR 60 Subpart Dc</p> <p>NESHAP 40 CFR 63 Subpart JJJJJ</p>	<p>NSPS Subpart Dc applies to each boiler with a capacity between 10 and 100 MMBtu/hr, that was manufactured after June 1989. The rated capacity of the boilers range from 35.87 to 41.74 MMbtu/hr. The boilers were manufactured in 1992, 1996, 1997, 1999, 2003, 2005, and 2006. Therefore NSPS Subpart Dc applies to these boilers.</p> <p>NESHAP Subpart JJJJJ applies to each boiler after it burns diesel for reasons other gas curtailment, gas supply emergencies, or periodic testing on liquid fuel.</p>
Gasoline Storage Tanks and Gasoline Dispensing Facility	None	<p>40 CFR 60 Subparts K, Ka, and Kb</p> <p>A.A.C. R18-2-710</p> <p>40 CFR 63 Subpart CCCCC</p>	<p>NSPS Subparts K applies to storage tanks with a capacity greater than 40,000 gallons that were built between June 11, 1973, and May 19, 1978. Subpart Ka applies to storage tanks with a capacity greater than 40,000 gallons that were built between May 18, 1978, and July 23, 1984. NSPS Subpart Kb applies to storage tanks with a capacity greater than 19,875 gallons that were built after July 23, 1984. All storage tanks at this facility are less than 19,875 gallons, and are therefore not subject to NSPS Subparts K, Ka, or Kb.</p> <p>A.A.C. R18-2-710 applies to storage tanks handling petroleum liquids, and hence, applies to the gasoline storage tank.</p> <p>NESHAP Subpart CCCCC applies to the gasoline dispensing facility.</p>



Unit & year	Control Device	Rule	Discussion
Internal Combustion Engines	None	40 CFR 63 Subpart III  40 CFR 63 Subpart ZZZZ  A.A.C. R18-2-719	The applicability date for NSPS Subpart III is April 1, 2006 for compression ignition engines. All the internal combustion engines were manufactured prior to April 1, 2006. Therefore NSPS Subpart III does not apply.  Because all internal combustion engines were manufactured prior to April 1, 2006, they are subject to the requirements of 40 CFR 63, Subpart ZZZZ.  A.A.C. R18-2-719 applies to all internal combustion engines not subject to NSPS Subpart III.
Mobile Sources	Dust Suppressants	A.A.C. R18-2 Article 8	Emissions from Mobile Sources (New and Existing) – This Article is applicable to mobile sources which either move while emitting air pollutant or are frequently moved in their utilization.
Fugitive dust sources	Water Trucks, Dust Suppressants	A.A.C. R18-2 Article 6 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 R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 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

Table 5 addresses the changes made to the sections and conditions from Permit No. 63639:

**Table 5: Previous Permit Conditions**

Section No.	Determination			Comments
	Added	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: Revised testing schedule for the years of 2021-2025.
Att. "B" Section VI			X	Sulfuric Acid Tanks: These tanks were determined to be a trivial activity after review of the source.
Att. "B" Section VII		X		Fugitive Dust Requirements: Renumbered to Section VI. Revised to represent the most recent template language.
Att. "B" Section IX		X		Other Periodic Activities: Renumbered to Section VIII. Revised to represent the most recent template language.
Att. "C"		X		Equipment List: Revised to reflect the most recent equipment operating at the facility and to include equipment information provided.

**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. 88010**

<b>Emission Unit</b>	<b>Pollutant / Source</b>	<b>Emission Limit / Standard</b>	<b>Monitoring Requirements</b>	<b>Recordkeeping Requirements</b>	<b>Reporting Requirements</b>
Boiler	Fuel Usage (Natural Gas)	2,050 MMSCF cumulatively in any 12-month rolling period.	<p>Calibrate, maintain, and operate gas flow meter(s), one for each boiler, that continuously monitor and record the amount of natural gas combusted each day.</p> <p>Calculate and record the rolling 12-month total of natural gas fired in all boilers at the facility monthly.</p>	Record the amount of natural gas fired in each boiler at the facility daily.	
	Hours of Operation (Diesel Fuel)	9,000 hours cumulatively in any 12-month rolling period.	Calculate and record the rolling 12-month total of hours operated on diesel fuel in all boilers at the facility each month.	Record the number of hours each boiler operated on diesel fuel at the facility daily.	

Emission Unit	Pollutant / Source	Emission Limit / Standard	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
	NOx	62.32 lbs/MMSCF	Performance Testing once every 3 years for each boiler The Permittee shall use EPA Reference Method 7 or 7E to determine NOx emissions.	Keep records of the date and details of any low NOx burner tuning that is conducted.	
	Opacity	20% opacity except for one 6-minute period per hour of not more than 27 percent opacity	Monitor visible emissions from the stack of each boiler while burning diesel fuel each month.	Maintain records of each occurrence and duration of startups, shutdowns, and malfunctions.	
Sulfur Burners	PM	20% Opacity	Monitor visible emissions from the stack of the sulfur burner when burning sulfur each month.		
Gasoline Dispensing Facilities	Gasoline Throughput			Record of the gasoline throughput of the gasoline dispensing facility.  Maintain a file of the typical Reid vapor pressure of gasoline stored and dates of storage.	

Emission Unit	Pollutant / Source	Emission Limit / Standard	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
Internal Combustion Engines	HP-Hours	6,042,750	Calculate a rolling 12-month hp-hr total for all generators combined.	Record the monthly operating hp-hr and calculate a rolling 12-month hp-hr total for each generator.	
Engines (subject to state regulations)	PM	40% opacity – for any period greater than 10 seconds	Conduct periodic opacity monitoring on a monthly basis.	Maintain records of the lower heating value of the fuel.	Report all 6-minute periods which the opacity exceeded 15%.
	SO <sub>2</sub>	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%.
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.	
Abrasive Blasting	PM	20% Opacity		Record the date, duration and pollution control measures of any abrasive blasting project.	
Spray Painting	VOC	20% Opacity		Maintain records of the date, duration, quantity of paint used, any applicable	

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<b>Emission Unit</b>	<b>Pollutant / Source</b>	<b>Emission Limit / Standard</b>	<b>Monitoring Requirements</b>	<b>Recordkeeping Requirements</b>	<b>Reporting Requirements</b>
		Control 96% of the overspray		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. AMBIENT AIR IMPACT ANALYSIS**

NatureSweet USA, LLC performed air dispersion modeling as part of the renewal process for Permit No. 63639. The modeling results below in Table 7 illustrate that the facility will not interfere with the NAAQS.

**Table 7: Air Dispersion Modeling Results**

Pollutant	Averaging Period	Concentrations ( $\mu\text{g}/\text{m}^3$ )			NAAQS ( $\mu\text{g}/\text{m}^3$ )
		Modeled Concentration	Background	Total	
PM <sub>10</sub>	24-hour	18.78	54.00	72.8	150
PM <sub>2.5</sub>	24-hour	18.41	9.42	27.8	35
	Annual	0.65	3.40	4.1	12
SO <sub>2</sub>	1-hour	5.22	5.21	10.4	196
	3-hour	3.43	43.00	46.4	1,300
NO <sub>2</sub>	1-hour	145.10	28.40	173.5	188
	Annual	4.37	4.66	9.03	100
CO	1-hour	813.96	582.00	1,396.0	40,000
	8-hour	380.41	582.00	962.4	10,000

**XII. LIST OF ABBREVIATIONS**

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
AERMOD	AMS/EPA Regulatory Model
AQD	Air Quality Division
A.R.S.	Arizona Revised Statutes
Btu/ft <sup>3</sup>	British Thermal Units per Cubic Foot
CFR	Code of Federal Regulations
CH <sub>4</sub>	Methane
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent basis
EPA	Environmental Protection Agency
ft	Feet
g	Gram
GHG	Greenhouse Gases
HAP	Hazardous Air Pollutant
hp	Horsepower
hr	Hour
NAAQS	National Ambient Air Quality Standard
NO <sub>x</sub>	Nitrogen Oxides
NO <sub>2</sub>	Nitrogen Dioxide
N <sub>2</sub> O	Nitrous Oxide
NSPS	New Source Performance Standards
Pb	Lead
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter less than 10 µm nominal aerodynamic diameter
PM <sub>2.5</sub>	Particulate Matter less than 2.5 µm nominal aerodynamic diameter
PSD	Prevention of Significant Deterioration
psia	Pounds per square Inch (absolute)
PTE	Potential to Emit
sec	Seconds
SO <sub>2</sub>	Sulfur Dioxide
TPY	Tons per Year
VOC	Volatile Organic Compound
yr	Year