

## SMAQMD BACT CLEARINGHOUSE

**ACTIVE**

CATEGORY Type: **APC - OXIDIZER**

BACT Category: Small Emitter BACT (PTE <10lb/day)

BACT Determination Number:	371	BACT Determination Date:	10/22/2024
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### Equipment Information

**Permit Number:** 27824  
**Equipment Description:** Afterburner, Thermal Oxidizer  
**Unit Size/Rating/Capacity:** All  
**Equipment Location:** EXACT ALLOYS, LLC  
 1940 RAILROAD DR, SACRAMENTO, CA 95815

### BACT Determination Information

**District Contact:** Vy Doan      **Phone No.:** (279) 207-1177      **Email:** Vdoan@airquality.org

<b>ROCs</b>	<b>Standard:</b>	
	<b>Technology Description:</b>	
	<b>Basis:</b>	
<b>NOx</b>	<b>Standard:</b>	20 ppm at 3% O2
	<b>Technology Description:</b>	Low-NOx Burner
	<b>Basis:</b>	Achieved in Practice
<b>SOx</b>	<b>Standard:</b>	
	<b>Technology Description:</b>	
	<b>Basis:</b>	
<b>PM10</b>	<b>Standard:</b>	
	<b>Technology Description:</b>	
	<b>Basis:</b>	
<b>PM2.5</b>	<b>Standard:</b>	
	<b>Technology Description:</b>	
	<b>Basis:</b>	
<b>CO</b>	<b>Standard:</b>	1000 ppm at 3% O2
	<b>Technology Description:</b>	Natural gas fuel and good combustion practices

	<b>Basis:</b>	Achieved in Practice
<b>LEAD</b>	<b>Standard:</b>	
	<b>Technology Description:</b>	
	<b>Basis:</b>	
<b>Comments:</b>	(A) Emission limit applies to burners in units fueled by 100% natural gas and clean air that are used to incinerate air toxics, VOCs, or other vapors; or to heat a unit. The emission limit applies solely when burning 100% gaseous fuel and not when the burner is incinerating air toxics, VOCs, or other vapors. The unit shall be tested or certified to meet the emission limit while fueled with natural gas. The limit only applies to units with a heat input rating of 325,000 Btu/hr or greater.	

Printed:

12/30/2024



## BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

**DETERMINATION NO.:** 371  
**DATE:** 6/1/2024  
**ENGINEER:** Vy Doan

**Category/General Equip Description:** APC - Oxidizer  
**Equipment Specific Description:** Afterburner, Thermal Oxidizer  
**Equipment Size/Rating:** Small Emitter BACT (PTE < 10 lb/day)  
**Previous BACT Det. No.:** 298

This BACT is for an afterburner at Exact Alloys, LLC. located at 1940 Railroad Drive, Sacramento (A/C 27818 27824). An afterburner, also known as a direct fired thermal oxidizer or incinerator, reduces emission by combustion. The afterburner is the control device used in the facility's scrap pretreatment process. Aluminum wheel scraps are placed in an oven and heated to remove coatings and contaminants. Coatings include paints and powder coatings. The exhaust from the oven is passed to the afterburner to control for volatile organic compound (VOC) emissions. Coatings and contaminants on aluminum scrap are a source of VOC and when the aluminum scraps are heated to remove coatings and contaminants, VOC is emitted.

This BACT determination will be for Small Emitter source category based on the District's "Otherwise-Exempt Equipment" BACT Determinations policy (dated 5/16/2019). The policy states that units which are classified as small emitters (less than 10 lbs/day of VOC, NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, or PM<sub>2.5</sub> and less than 550 lbs/day of CO) and are located at nonmajor stationary sources are only required to meet BACT standards that have been achieved in practice. Therefore, this BACT determination will only be based on what is achieved in practice and will only be applied to small emitters at non-major sources. BACT will be evaluated on a case-by-case basis for units that do not fit these criteria.

## BACT/T-BACT ANALYSIS

### A: ACHIEVED IN PRACTICE (Rule 202, §205.1a)

The following control technologies are currently employed as BACT/T-BACT for Direct Fired Thermal Oxidizers by the following air pollution control districts:

<b>US EPA</b>
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#### **BACT**

[Source: EPA RACT/BACT/LAER Clearinghouse](#)

From 1/1/2014 to 6/3/2024 there were zero determinations entered that contain the search term “afterburner” and there were 59 determinations entered that contain the search term thermal oxidizer. Of the 59 determinations under thermal oxidizer, zero determinations were applicable to direct fired thermal oxidizers.

<b>For units with a rating of <math>\geq 325,000</math> MMBtu/hr to <math>&lt; 5.0</math> MMBtu/hr</b>	
<b>VOC</b>	N/A – No BACT determinations found
<b>NOx</b>	N/A – No BACT determinations found
<b>SOx</b>	N/A – No BACT determinations found
<b>PM10</b>	N/A – No BACT determinations found
<b>PM2.5</b>	N/A – No BACT determinations found
<b>CO</b>	N/A – No BACT determinations found

#### **RULE REQUIREMENTS:**

[40 CFR Part 60 – New Source Performance Standards \(NSPS\):](#)

There are currently no 40 CFR, Part 60 NSPS sections that apply to this source category.

[40 CFR Part 61 – National Emission Standards for Hazardous Air Pollutants \(NESHAPS\):](#)

There are currently no 40 CFR, Part 61 NESHAPs that apply to this source category.

[40 CFR Part 63 – NESHAPS for Source Categories \(MACT Standards\):](#)

There are currently no 40 CFR, Part 63 NESHAPs that apply to this source category.

**California Air Resources Board (CARB)**

**BACT**

[Source: ARB BACT Clearinghouse](#)

<b>ARB BACT Clearinghouse (A)</b>	
<b>VOC</b>	N/A – No BACT determinations found
<b>NOx</b>	N/A – No BACT determinations found
<b>SOx</b>	N/A – No BACT determinations found
<b>PM10</b>	N/A – No BACT determinations found
<b>PM2.5</b>	N/A – No BACT determinations found
<b>CO</b>	N/A – No BACT determinations found

(A) BACT for 3 thermal oxidizers were listed from SCAQMD, however those were for a Major Source BACT. Therefore, they will not be considered achieved in practice for this BACT determination.

**RULE REQUIREMENTS:**

[ARB Airborne Toxic Control Measures \(ATCM\):](#)

There are currently no ATCMs that apply to this source category.

**Sacramento Metropolitan AQMD**

**BACT**

[Source: SMAQMD BACT Clearinghouse](#)

<b>SMAQMD BACT Clearinghouse</b>	
<b>VOC</b>	N/A – No BACT determinations found
<b>NOx</b>	30 ppm at 3% O <sub>2</sub> <sup>(A)</sup>
<b>SOx</b>	N/A – No BACT determinations found
<b>PM10</b>	N/A – No BACT determinations found
<b>PM2.5</b>	N/A – No BACT determinations found
<b>CO</b>	N/A – No BACT determinations found

(A) Based on SMAQMD BACT Determination #298, which expired 12/02/2023.

**RULE REQUIREMENTS:**

[Rule 404 – Particulate Matter \(11/20/1984\)](#)

This rule limits particulate matter emissions to less than 0.23 grams per dry standard cubic meter (0.1 grains per dry standard cubic foot).

[Rule 406 – Specific Contaminants \(12/06/1978\)](#)

This rule limits sulfur emissions to less than 0.2% by volume, except as otherwise provided in Rule 420, calculated as sulfur dioxide (SO<sub>2</sub>). This rule also limits combustion contaminants to less than 0.23 grams per dry standard cubic meter (0.1 grains per dry standard cubic foot) of gas calculated to 12% of carbon dioxide (CO<sub>2</sub>).

[Rule 419 – NOx From Miscellaneous Combustion Units \(10/25/2018\)](#)

This rule applies to any miscellaneous combustion unit or cooking unit with a total rated heat input capacity of 2 million Btu per hour or greater that is located at a major stationary source of NOx and to any miscellaneous combustion unit or cooking unit with a total rated heat input capacity of 5 million Btu per hour or greater that is not located at a major stationary source of NOx. Since an afterburner is an air pollution control device, the requirements of this do not apply.

[Rule 420 – Sulfur Content of Fuels \(8/13/81\)](#)

No person shall burn any gaseous fuels containing sulfur compounds in excess of 50 grains per 100 cubic feet, calculated as hydrogen sulfide at standard conditions, or any liquid fuel or solid fuel having a sulfur content in excess of 0.5% by weight.

**South Coast AQMD**

**BACT**

Source: [SCAQMD BACT Guidelines for Non-Major Polluting Facilities, page 126.](#)

<b>Thermal Oxidizer (Afterburner), Catalytic Oxidizer – Natural Gas Fired <sup>(A)</sup></b>	
<b>VOC</b>	No standard
<b>NOx</b>	30 ppmvd corrected to 3% O <sub>2</sub> (Burner emissions only)
<b>SOx</b>	No standard
<b>PM10</b>	No standard
<b>PM2.5</b>	No standard
<b>CO</b>	No standard

(A) Does not include tank degassing, soil vapor extraction, and vapor incinerators where vapors are directed into the burner or into a combustion chamber.

**T-BACT**

There are no T-BACT standards published in the clearinghouse for this category.

**RULE REQUIREMENTS:**

[Rule 1147 – NOx Reductions From Miscellaneous Sources \(05/06/2022\)](#)

The purpose of this rule is to reduce nitrogen oxide (NOx) emissions while limiting carbon monoxide (CO) emissions from gaseous and liquid fuel fired combustion equipment as defined in this rule. Units with a heat input rating below 325,000 Btu/hr are exempt from the provisions of this rule. Additionally, flares, afterburners, degassing units, thermal or catalytic oxidizers or

vapor incinerators in which fuel is used only to maintain a pilot for vapor ignition or is used for five minutes or less to bring a unit up to minimum operating temperature are exempt from the provisions of this rule. New afterburners and thermal oxidizers are required to meet the emission limits listed in Rule 1147, Table 2.

Equipment Categories	Process Temperature	Emission Limits (ppmv corrected to 3% O <sub>2</sub> , dry unless otherwise specified)	
		NOx Limit	CO Limit
<b>Gaseous Fuel-Fired Equipment <sup>(A)</sup></b>			
Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator	All	20 ppmv or 0.024 lb/mmBtu	1,000 ppm

(A) Emission limit applies to burners in units fueled by 100% natural gas and clean air that are used to incinerate air toxics, VOCs, or other vapors; or to heat a unit. The emission limit applies solely when burning 100% gaseous fuel and not when the burner is incinerating air toxics, VOCs, or other vapors. The unit shall be tested or certified to meet the emission limit while fueled with natural gas.

[Rule 431.1 – Sulfur Content of Gaseous Fuels \(06/12/1998\)](#)

The purpose of this rule is to reduce sulfur oxides (SOx) emissions from the combustion of gaseous fuels in stationary equipment permitted by the SCAQMD. Table 1 of this rule shows the sulfur content requirements for Other Gases.

<b>Rule 431.1 Table 1 Concentration Limits as Measured Over the Averaging Periods for Various Gaseous Fuels Containing Sulfur Compounds Calculated as H<sub>2</sub>S</b>			
Fuel Type	Sulfur Limits (ppmv)	Averaging Period	Compliance Date on or After
Refinery Gas			
Small Refiners	40	4 hours	May 4, 1996
Other Refiners	40	4 hours	May 4, 1994
Landfill Gas	150	Daily	June 12, 1998
Sewage Digester Gas	40 or 40 and 500	Daily or Monthly and 15-minutes	November 17, 1995
Other Gases	40	4 hours	May 4, 1994

[Rule 474 – Fuel Burning Equipment - Oxides of Nitrogen \(12/04/1981\)](#)

The purpose of this rule is to limit emissions of oxides of nitrogen from fuel burning equipment. The rule is applicable to all non-mobile fuel burning equipment with a maximum gross input heat rating of 555 million Btu per hour or greater.

Maximum Gross Heat Input Rate in Millions Per Hour			
Fuel	British Thermal Units		
	555 ≤ rating <1,786	1,786 ≤ rating <2,143	2,143 ≤ rating
Gas	300 ppm NOx (A)	225 ppm NOx (A)	125 ppm NOx (A)
Liquid or Solid	400 ppm NOx (A)	325 ppm NOx (A)	225 ppm NOx (A)

(A) Expressed as nitrogen dioxide (NO<sub>2</sub>), calculated at 3% oxygen on a dry basis averaged over a minimum of 15 consecutive minutes.

**San Diego County APCD**

**BACT**

Source: [New Source Review Requirements For Best Available Control Technology \(Bact\) - Guidance Document \(November 2023\)](#) and <https://www.sdapcd.org/content/sdapcd/permits/BACT.html>

Afterburner	
<b>VOC</b>	N/A – No BACT determinations found
<b>NOx</b>	N/A – No BACT determinations found
<b>SOx</b>	N/A – No BACT determinations found
<b>PM10</b>	N/A – No BACT determinations found
<b>PM2.5</b>	N/A – No BACT determinations found
<b>CO</b>	N/A – No BACT determinations found

**T-BACT**

There are no T-BACT standards published in the clearinghouse for this category.

**RULE REQUIREMENTS:**

[Rule 53 - Specific Air Contaminants \(01/22/1997\)](#)

This rule limits PM emissions from the burning of carbon-containing material to 0.10 grains per dry standard cubic foot (0.23 grams per dry standard cubic centimeter) at 12% CO<sub>2</sub> by volume.

[Rule 62 - Sulfur Content Of Fuels \(10/21/1981\)](#)

This rule applies to all stationary fuel burning equipment except as provided for by Rule 53, and except for the combustion of sewage treatment plant digester gases and the incineration of gases emitted from solid waste disposal landfill sites. This rule limits the sulfur content in fuels to 10 grains of sulfur compounds, calculated as H<sub>2</sub>S, per 100 cubic feet (0.23 grams sulfur, calculated as H<sub>2</sub>S, per cubic meter) of dry gaseous fuel at standard conditions.

[Rule 68 - Fuel-Burning Equipment - Oxides Of Nitrogen \(09/20/1994\)](#)

This rule limits NOx emissions to 125 ppmvd at 3% O<sub>2</sub> and 240 mg/m<sup>3</sup> at 20°C for gaseous



fuels. This rule applies to any non-vehicular, fuel-burning equipment that has a maximum heat input rating greater than or equal to 50 MMBtu/hr.

<b>Bay Area AQMD</b>
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**BACT**

Source: [BAAQMD BACT Guideline](#)

<b>BAAQMD BACT Guideline</b>	
<b>VOC</b>	N/A – No BACT determinations found
<b>NOx</b>	N/A – No BACT determinations found
<b>SOx</b>	N/A – No BACT determinations found
<b>PM10</b>	N/A – No BACT determinations found
<b>PM2.5</b>	N/A – No BACT determinations found
<b>CO</b>	N/A – No BACT determinations found

**T-BACT**

There are no T-BACT standards published in the clearinghouse for this category.

**RULE REQUIREMENTS:**

[Reg 6 Particulate Matter, Rule 1 – General Requirements 2018 Amendment \(08/01/2018\)](#)

This rule limits Total Suspended Particulate (TSP) concentration from any source to less than or equal to 343 mg/dscm (0.15 grains/dscf) of exhaust gas volume.

[Reg 8 Organic Compound, Rule 2 – Miscellaneous Operations \(05/04/2022\)](#)

This rule limits precursor organic compounds (POC) emissions from miscellaneous operations to 6.8 kg/day (15 lb/day) and 300 ppm total carbon on a dry basis.

[Reg 9 Inorganic Gaseous Pollutants, Rule 1 – Sulfur Dioxide \(11/03/2021\)](#)

This rule limits sulfur dioxide (SO<sub>2</sub>) emissions from any source, other than a ship, to 300 ppm (dry). This rule also limits ground-level concentrations of SO<sub>2</sub> from any emission source, other than ships, to 0.5 ppm continuously for 3 consecutive minutes, or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours.

[Reg 9 Inorganic Gaseous Pollutants, Rule 2 – Hydrogen Sulfide \(revised 4/24/2018\)](#)

This rule limits, during any 24-hour period, ground-level concentrations of hydrogen sulfide (H<sub>2</sub>S) from any emission source to 0.06 ppm averaged over three consecutive minutes or 0.03 ppm averaged over any 60 consecutive minutes. The limitations of this Rule shall not apply to concentrations of H<sub>2</sub>S occurring on the property where the emissions occur providing that such property, from the emission point to the point of any such concentrations, is controlled by the person responsible for the emission.

**San Joaquín Valley Unified APCD**

**BACT**

Source: [SJVUAPCD BACT Clearinghouse](#)

<b>SJVUAPCD BACT Clearinghouse</b>	
<b>VOC</b>	N/A – No BACT determinations found
<b>NOx</b>	N/A – No BACT determinations found
<b>SOx</b>	N/A – No BACT determinations found
<b>PM10</b>	N/A – No BACT determinations found
<b>PM2.5</b>	N/A – No BACT determinations found
<b>CO</b>	N/A – No BACT determinations found

**T-BACT**

There are no T-BACT standards published in the clearinghouse for this category.

**RULE REQUIREMENTS:**

**[Rule 4201 – Particulate Matter Concentration \(12/17/1992\)](#)**

This rule limits PM emissions from any single source operation, dust, fumes, or total suspended PM to 0.1 grains per dry standard cubic foot of gas.

**[Rule 4301 – Fuel Burning Equipment \(12/17/1992\)](#)**

This rule limits the emissions of SO<sub>2</sub>, NO<sub>x</sub>, and combustion contaminants from fuel burning equipment. The rule defines fuel burning equipment as any furnace, boiler, apparatus, and stack used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. Fuel burning equipment serving primarily as air pollution control equipment are exempt.

**[Rule 4801 – Sulfur Compounds \(12/17/1992\)](#)**

This rule limits the emissions of sulfur compounds to two-tenths (0.2) percent by volume calculated as SO<sub>2</sub>, on a dry basis averaged over 15 consecutive minutes. EPA Method 8 and CARB Method 1-100 (Continuous Emission Stack Sampling) must be used to determine compliance with the rule limit.

**Summary of Achieved in Practice Control Technologies**

The following control technologies have been identified and are ranked based on stringency:

<b>SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES</b>	
<b>Pollutant</b>	<b>Standard</b>
<b>VOC</b>	1. No standard – [SMAQMD, SCAQMD, BAAQMD, SJVAPCD, SDCAPCD]
<b>NOx</b>	1. 20 ppmvd corrected to 3% O <sub>2</sub> <sup>(A)</sup> – [SCAQMD] 2. 30 ppmvd corrected to 3% O <sub>2</sub> <sup>(B)</sup> – [SMAQMD]
<b>SOx</b>	1. No standard – [SMAQMD, SCAQMD, BAAQMD, SJVAPCD, SDCAPCD]
<b>PM10</b>	1. No standard – [SMAQMD, SCAQMD, BAAQMD, SJVAPCD, SDCAPCD]
<b>PM2.5</b>	1. No standard – [SMAQMD, SCAQMD, BAAQMD, SJVAPCD, SDCAPCD]
<b>CO</b>	1. 1,000 ppm at 3% O <sub>2</sub> <sup>(B)</sup> – [SCAQMD]

(A) Emission limit applies to burners in units fueled by 100% natural gas and clean air that are used to incinerate air toxics, VOCs, or other vapors; or to heat a unit. The emission limit applies solely when burning 100% gaseous fuel and not when the burner is incinerating air toxics, VOCs, or other vapors. The unit shall be tested or certified to meet the emission limit while fueled with natural gas. The limit only applies to units with a heat input rating of 325,000 Btu/hr or greater.

(B) Based on SMAQMD BACT Determination #298, which expired 12/02/2023.

The following control technologies have been identified as the most stringent, achieved in practice control technologies:

<b>BEST CONTROL TECHNOLOGIES ACHIEVED</b>		
<b>Pollutant</b>	<b>Standard</b>	<b>Source</b>
VOC	No standard	
NOx	20 ppm at 3% O <sub>2</sub> <sup>(A)</sup>	SCAQMD
SOx	No standard	
PM10	No standard	
PM2.5	No standard	
CO	1,000 ppm at 3% O <sub>2</sub> <sup>(A)</sup>	SCAQMD

(A) Emission limit applies to burners in units fueled by 100% natural gas and clean air that are used to incinerate air toxics, VOCs, or other vapors; or to heat a unit. The emission limit applies solely when burning 100% gaseous fuel and not when the burner is incinerating air toxics, VOCs, or other vapors. The unit shall be tested or certified to meet the emission limit while fueled with natural gas. The limit only applies to units with a heat input rating of 325,000 Btu/hr or greater.

**B. TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (Rule 202, §205.1.b.)**

The District’s Small Emitter and “Otherwise-Exempt Equipment” BACT Determinations policy (dated 5/16/2019) states that units which are classified as small emitters (less than 10 lbs/day of VOC, NOx, SOx, PM10, or PM2.5 and less than 550 lbs/day of CO) and are located at non-major stationary sources are only required to meet BACT standards that have been achieved in practice. Therefore, this BACT determination will only be based on what is achieved in practice and will only be applied to small emitters at non-major sources. BACT will be evaluated on a case-by-case basis for units that do not fit these criteria.

**C. SELECTION OF BACT**

Based on the above analysis, BACT for VOC, NOx, SOx, PM10, PM2.5 and CO will be the most stringent standards of what is currently achieved in practice.

<b>BACT #371 FOR DIRECT FIRED THERMAL OXIDIZER UNITS WITH HEAT INPUT RATING ≥ 325,000 BTU/HR.</b>		
<b>Pollutant</b>	<b>Standard</b>	<b>Source</b>
VOC	No standard	
NOx	20 ppm at 3% O <sub>2</sub> <sup>(A)</sup>	SCAQMD
SOx	No standard	
PM10	No standard	
PM2.5	No standard	
CO	1,000 ppm at 3% O <sub>2</sub> <sup>(A)</sup>	SCAQMD

(A) Emission limit applies to burners in units fueled by 100% natural gas and clean air that are used to incinerate air toxics, VOCs, or other vapors; or to heat a unit. The emission limit applies solely when burning 100% gaseous fuel and not when the burner is incinerating air toxics, VOCs, or other vapors. The unit shall be tested or certified to meet the emission limit while fueled with natural gas.

APPROVED BY: Brian F Krebs DATE: 10-22-2024