

BACT Determination Number: 136	BACT Determination Date: 3/3/2017
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Equipment Information

Permit Number: N/A -- Generic BACT Determination
Equipment Description: BOILER
Unit Size/Rating/Capacity: >= 75,000 Btu/hr and < 2.0 MMBtu/hr fired on NG
Equipment Location:

BACT Determination Information

ROCs	Standard:	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Practice
NOx	Standard:	20ppm or pool/spa heaters < 400,000Btu/hr = 55ppm
	Technology Description:	Low NOx burner with good combustion practices
	Basis:	Achieved in Practice
SOx	Standard:	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Practice
PM10	Standard:	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Practice
PM2.5	Standard:	Good Combustion Practices
	Technology Description:	
	Basis:	Achieved in Practice
CO	Standard:	400 ppm
	Technology Description:	Low NOx burner with good combustion practices
	Basis:	Achieved in Practice
LEAD	Standard:	
	Technology Description:	
	Basis:	

Comments: All units listed ppm are ppmvd corrected to 3% O2

District Contact: Joe Carle Phone No.: (916) 874 - 4838 email: jcarle@airquality.org



BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NO.: 136
DATE: 1/25/2017
ENGINEER: Joe Carle

Category/General Equip Description: Boiler/Heater – Natural gas
Equipment Specific Description: Boiler/heater greater or equal to 75,000 BTU/hr and less than 2.0 MMBTU/hr, fired on natural gas
Equipment Size/Rating: Small Emitter BACT (PTE < 10 lb/day)
Previous BACT Det. No.: 112

This BACT determination will update Determination #112 for boilers/heaters greater or equal to 75,000 BTU/hr and less than 2.0 MMBtu/hr, fired on natural gas.

BACT ANALYSIS

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

The following control technologies are currently employed as BACT for boilers/heaters greater or equal to 75,000 BTU/hr and less than 2.0 MMBTU/hr fueled by natural gas by the following air pollution control districts:

District/Agency	Best Available Control Technology (BACT)/Requirements
US EPA	<u>BACT</u> Source: EPA RACT/BACT/LAER Clearinghouse
	For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr
	VOC N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range
	NOx N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range
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	CO N/A – No BACT determinations found in the ≥ 0.075 to <2 MMBtu/hr range
<u>RULE REQUIREMENTS:</u> None	

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ARB	<p>BACT Source: ARB BACT Clearinghouse</p> <table border="1"> <thead> <tr> <th colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</th> </tr> </thead> <tbody> <tr> <td>VOC</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>NOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>SOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM10</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM2.5</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>CO</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> </tbody> </table> <p>RULE REQUIREMENTS: None</p>	For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr		VOC	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	NOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	SOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM10	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM2.5	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	CO	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range
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SMAQMD	<p>BACT Source: SMAQMD BACT #112</p> <table border="1"> <thead> <tr> <th colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</th> </tr> </thead> <tbody> <tr> <td>VOC</td> <td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td> </tr> <tr> <td>NOx</td> <td>Pool/spa heaters: 55 ppmvd at 3% O₂ All other boilers/heaters: 20 ppmvd at 3% O₂</td> </tr> <tr> <td>SOx</td> <td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td> </tr> <tr> <td>PM10</td> <td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td> </tr> <tr> <td>PM2.5</td> <td>Good combustion practice; Use of natural gas or LPG if natural gas is not available.</td> </tr> <tr> <td>CO</td> <td>400 ppmvd at 3% O₂, Burner technology controlling NOx as a priority</td> </tr> </tbody> </table> <p>RULE REQUIREMENTS: Rule 414 - Water Heaters, Boilers And Process Heaters Rated Less Than 1,000,000 BTU Per Hour For units with a rating of $\geq 75,000$ Btu/hr to $< 400,000$ Btu/hr Pool/Spa Heater – 55 ppmvd of NOx corrected to 3% O₂ All others – 20 ppmvd of NOx corrected to 3% O₂</p> <p>For units with a rating of $\geq 400,000$ Btu/hr to < 1 MMBtu/hr 20 ppmvd of NOx corrected to 3% O₂ 400 ppmvd of CO corrected to 3% O₂</p> <p>Rule 411 - NOx from Boilers, Process Heaters and Steam Generators For units with a rating of ≥ 1 MMBtu/hr to < 2 MMBtu/hr 30 ppmvd of NOx corrected to 3% O₂ 400 ppmvd of CO corrected to 3% O₂</p>	For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr		VOC	Good combustion practice; Use of natural gas or LPG if natural gas is not available.	NOx	Pool/spa heaters: 55 ppmvd at 3% O ₂ All other boilers/heaters: 20 ppmvd at 3% O ₂	SOx	Good combustion practice; Use of natural gas or LPG if natural gas is not available.	PM10	Good combustion practice; Use of natural gas or LPG if natural gas is not available.	PM2.5	Good combustion practice; Use of natural gas or LPG if natural gas is not available.	CO	400 ppmvd at 3% O ₂ , Burner technology controlling NOx as a priority
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South Coast AQMD	<p><u>BACT</u> Source: SCAQMD BACT Guidelines for Non-Major Polluting Facilities Note: SCAQMD BACT Guidelines do not contain a determination for boilers/heaters 2 MMBtu/hr or less, since these units are not required to obtain a written permit, pursuant to SCAQMD Rule 219.</p> <p><u>SCAQMD Rule 219(b)(2)</u> Written permits are not required for boilers, process heaters, or any combustion equipment that has a rated maximum heat input capacity of 2,000,000 Btu per hour (gross) or less and are equipped to be heated exclusively with natural gas, methanol, liquefied petroleum gas, or any combination thereof.</p> <table border="1"> <thead> <tr> <th colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</th> </tr> </thead> <tbody> <tr> <td>VOC</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>NOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>SOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM10</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM2.5</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>CO</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> </tbody> </table> <p><u>RULE REQUIREMENTS:</u></p> <p>Reg XI, Rule 1146.2 – Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters</p> <table border="1"> <thead> <tr> <th>Category</th> <th>NOx Limit</th> <th>CO Limit</th> <th>Units manufactured for use or offered for sale after</th> </tr> </thead> <tbody> <tr> <td>Type 1 Unit (except pool heaters)</td> <td>14 nanograms per joule of heat output (20 ppmvd @ 3% O₂)</td> <td>No standard</td> <td>January 1, 2012</td> </tr> <tr> <td>Type 1 Unit (pool heater)</td> <td>40 nanograms per joule of heat output (55 ppmvd NOx @3% O₂)</td> <td>No standard</td> <td>January 1, 2001</td> </tr> <tr> <td>Type 2 Unit</td> <td>14 nanograms per joule of heat output (20 ppmvd @ 3% O₂)</td> <td>400 ppmvd @ 3% O₂</td> <td>January 1, 2010</td> </tr> </tbody> </table> <p>(A) TYPE 1 UNIT means any water heater, boiler or process heater with a RATED HEAT INPUT CAPACITY less than or equal to 400,000 BTU per hour excluding TANK TYPE WATER HEATERS subject to the limits of District Rule 1121. (B) TYPE 2 UNIT means any water heater, boiler or process heater with a RATED HEAT INPUT CAPACITY greater than 400,000 BTU per hour up to and including 2,000,000 BTU per hour.</p>	For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr		VOC	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	NOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	SOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM10	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM2.5	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	CO	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	Category	NOx Limit	CO Limit	Units manufactured for use or offered for sale after	Type 1 Unit (except pool heaters)	14 nanograms per joule of heat output (20 ppmvd @ 3% O ₂)	No standard	January 1, 2012	Type 1 Unit (pool heater)	40 nanograms per joule of heat output (55 ppmvd NOx @3% O ₂)	No standard	January 1, 2001	Type 2 Unit	14 nanograms per joule of heat output (20 ppmvd @ 3% O ₂)	400 ppmvd @ 3% O ₂	January 1, 2010
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District/Agency	Best Available Control Technology (BACT)/Requirements																
San Diego County APCD	<p><u>BACT</u> Source: NSR Requirements for BACT Note: SDCAPCD BACT Guidelines do not contain a determination for boilers/heaters 5 MMBtu/hr or less, since these units are not required to obtain a written permit, pursuant to SDAPCD Rule 11.</p> <p><u>SDAPCD Rule 11(d)</u> Any equipment, operation, or process that is listed below in Subsections (d)(1) through (d)(20), and that meets the stated exemption provision, parameter, requirement, or limitation, is exempt from the requirements of Rule 10. (d)(2)(v) Any boiler, process heater, or steam generator with a manufacturer's maximum gross heat input rating of less than 5 million BTU per hour fired exclusively with natural gas and/or liquefied petroleum gas.</p> <table border="1"> <thead> <tr> <th colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</th> </tr> </thead> <tbody> <tr> <td>VOC</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>NOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>SOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM10</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM2.5</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>CO</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> </tbody> </table>	For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr		VOC	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	NOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	SOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM10	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM2.5	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	CO	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range		
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	<p><u>RULE REQUIREMENTS:</u> Regulation 4, Rule 69.2.1 – Small Boilers, Process Heaters, and Steam Generators</p>																
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<p>(A) This rule does not apply to waste heat recovery boilers (B) This rule does not apply to Furnaces, kilns, and any combustion equipment where the material being heated is in direct contact with the products of combustion. (C) This rule does not apply to thermal oxidizers and associated waste heat recovery equipment.</p>																	

District/Agency	Best Available Control Technology (BACT)/Requirements														
Bay Area AQMD	<p>BACT Source: BAAQMD BACT Guideline Note: BAAQMD BACT Guidelines do not contain a determination for boilers/heaters 10 MMBtu/hr or less fired exclusively on natural gas or LPG, since these units are not required to obtain a written permit, pursuant to BAAQMD Regulation 2, Rule 1.</p> <p>BAAQMD Rule 2-1-114 The following equipment is exempt from the, requirements of Sections 2-1-301 and 302 (requirement to obtain an ATC or PTO): (114.1) Boilers, Heaters, Steam Generators, Duct Burners, and Similar Combustion Equipment: 1.2 Any of the above equipment with less than 10 million BTU per hour rated heat input if fired exclusively with natural gas (including compressed natural gas), liquefied petroleum gas (e.g. propane, butane, isobutane, propylene, butylenes, and their mixtures), or any combination thereof.</p>														
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District/Agency	Best Available Control Technology (BACT)/Requirements																											
San Joaquin Valley APCD	<p>BACT Source: SJVUAPCD BACT Guideline Note: SJVUAPCD BACT Guidelines do not contain a determination for boilers 5 MMBtu/hr or less, since these units are not required to obtain a written permit, pursuant to SJVUAPCD Rule 2020.</p> <p><u>SJVUAPCD Rule 2020 §6.0</u> No Authority to Construct or Permit to Operate shall be required for (§6.1) steam generators, steam superheaters, water boilers, water heaters, steam cleaners, and closed indirect heat transfer systems that have a maximum input heat rating of 5,000,000 Btu per hour (gross) or less and is equipped to be fired exclusively with (§6.1.1.1) natural gas, (§6.1.1.2) liquefied petroleum gas, or (§6.1.1.3) any combination of the two.</p> <table border="1"> <thead> <tr> <th colspan="2">For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr</th> </tr> </thead> <tbody> <tr> <td>VOC</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>NOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>SOx</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM10</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>PM2.5</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> <tr> <td>CO</td> <td>N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range</td> </tr> </tbody> </table>	For units with a rating of 75,000 Btu/hr to < 2 MMBtu/hr		VOC	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	NOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	SOx	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM10	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	PM2.5	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range	CO	N/A – No BACT determinations found in the ≥ 0.075 to < 2 MMBtu/hr range													
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<p>For units with a rating of ≥ 0.4 MMBtu/hr and < 2.0 MMBtu/hr: 400 ppmvd of CO corrected to 3% O₂</p>																												

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

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
VOC	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
NOx	1. Pool/spa heaters $< 400,000$ Btu/hr: 55 ppmvd at 3% O ₂ All other boilers/heaters: 20 ppmvd at 3% O ₂ - [SMAQMD, SCAQMD, SJVUAPCD] 2. Pool/spa heaters $< 400,000$ Btu/hr: no standard All other boilers/heaters: 20 ppmvd at 3% O ₂ - [BAAQMD] 3. Boilers/heaters $< 600,000$ Btu/hr: no standard All other boilers/heaters: 20 ppmvd at 3% O ₂ - [SDCAPCD]
SOx	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
PM10	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
PM2.5	1. Good combustion practices [SMAQMD (BACT)] 2. No standard [SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD]
CO	1. 400 ppmvd at 3% - [SMAQMD (BACT)] 2. Boilers/heaters $< 400,000$ Btu/hr: no standard All other boilers/heaters: 400 ppmvd at 3% O ₂ - [SCAQMD, SJVUAPCD] 3. Boilers/heaters $< 600,000$ Btu/hr: no standard All other boilers/heaters: 400 ppmvd at 3% O ₂ - [SDCAPCD] 4. No standard - [BAAQMD]

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

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	Standard	Source
VOC	Good combustion practices	SMAQMD (current BACT)
NOx	Pool/spa heaters $< 400,000$ Btu/hr: 55 ppmvd at 3% O ₂ All other boilers/heaters: 20 ppmvd at 3% O ₂	SMAQMD (Rule 414), SDCAPCD (Rule 4308), SCAQMD (Rule 1146.2)
SOx	Good combustion practices	SMAQMD (current BACT)
PM10	Good combustion practices	SMAQMD (current BACT)
PM2.5	Good combustion practices	SMAQMD (current BACT)
CO	400 ppmvd at 3% O ₂	SMAQMD (current BACT)

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

Technologically Feasible Alternatives:

Any alternative basic equipment, fuel, process, emission control device or technique, singly or in combination, determined to be technologically feasible by the Air Pollution Control Officer.

The table below shows the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be "Achieved in Practice" as per Rule 202, §205.1.a.

VOC	No other technologically feasible option identified
NOx	1. Selective Catalytic Reduction (SCR) 2. Flue Gas Recirculation (FGR) with a Low-NOx burner
SOx	No other technologically feasible option identified
PM10	No other technologically feasible option identified
PM2.5	No other technologically feasible option identified
CO	No other technologically feasible option identified

Cost Effective Determination

After identifying the technologically feasible control options, a cost analysis is performed to take into consideration economic impacts for all technologically feasible controls identified.

Maximum Cost per Ton of Air Pollutants Controlled

A control technology is considered to be cost-effective if the cost of controlling one ton of that air pollutant is less than the limits specified below (except coating operations):

<u>Pollutant</u>	<u>Maximum Cost (\$/ton)</u>
ROG	17,500
NO _x	24,500
PM ₁₀	11,400
SO _x	18,300
CO	TBD if BACT triggered

SCR:

Typically selective catalytic reduction (SCR) can be used to reduce emissions from larger boilers. SCR requires ammonia or urea for NOx reduction and units of this size range are typically used in residences and service/commercial applications where storage of these materials is impractical and could pose a health risk. Additionally, SCR is designed for industrial units that run full time and can maintain a temperature that the catalyst requires for NOx reduction, whereas smaller units are turned on and off throughout the day and cannot maintain the required temperatures. Finally, SCR systems require frequent maintenance for operation which may not be practical in a residential or small service/commercial setting.

District Staff has done an analysis¹ for using SCR on a boiler rated at 20 MMBTU/hr and the cost effectiveness was \$53,084 per ton of NOx reduced. As the rating of the unit goes down the total emission reduction will decrease while cost will stay relatively equivalent and therefore the cost effectiveness will increase. Therefore, SCR is not only technologically infeasible for this size range of boilers/heaters but it is also not cost effective and is eliminated as a control option.

FGR with a Low-NOx Burner:

Adding FGR to a smaller unit would result in minimal additional reductions when paired with a low-NOx burner, and would cost more than a low-NOx burner alone. Like SCR, the system requires frequent maintenance for operation which may not be practical in a residential or small service/commercial setting. The BAAQMD did an analysis of adding FGR to a boiler in the 400,000 to 2,000,000 Btu/hr range in their 2007 Staff Report for Regulation 9, Rule 6 and found that the

¹ SMAQMD, "BACT Determination: Boilers/Heaters ≥ 5 and < 20 MMBTU/hr fired on natural gas or LPG," June 3, 2015

incremental cost effectiveness of adding FGR over a low-NOx burner is estimated at \$60,000 per ton of NOx reduced. Therefore, FGR added to a boiler/heater with a low-NOx burner is not cost effective and is eliminated as a control option.

C. SELECTION OF BACT:

Because no other technically feasible alternatives are available for the size range of these boilers/heaters BACT for VOC, SOx, PM10, PM2.5 and CO will remain at what is currently achieved in practice. Currently what is in SMAQMD Rule 412 and other district rules are more stringent than the current BACT standard by limiting the size range of pool/spa heaters that can fall under the 55 ppmvd emission limit.

BACT for Boilers/Heaters $\geq 75,000$ Btu/hr and < 2.0 MMBtu/hr Fired on Natural Gas		
Pollutant	Standard	Source
VOC	Good combustion practices	SMAQMD (current BACT)
NOx	Pool/spa heaters $< 400,000$ Btu/hr: 55 ppmvd at 3% O ₂ All other boilers/heaters: 20 ppmvd at 3% O ₂	SMAQMD (Rule 414), SDCAPCD (Rule 4308), SCAQMD (Rule 1146.2)
SOx	Good combustion practices	SMAQMD (current BACT)
PM10	Good combustion practices	SMAQMD (current BACT)
PM2.5	Good combustion practices	SMAQMD (current BACT)
CO	400 ppmvd at 3% O ₂	SMAQMD (current BACT)

D. SELECTION OF T-BACT:

Toxics are in the form of VOCs and particulate matter. Since toxic emission from natural gas fired boilers in the 2 MMBtu/hr or less size range are so small and the cancer risk is not expected to be anywhere close to 1 in a million cases, T-BACT was not evaluated for this determination.

REVIEWED BY: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____