Proposed Updates to BACT Guidelines

BACT Scientific Review Committee Meeting #3

October 27, 2020

Join Zoom Meeting
https://scaqmd.zoom.us/j/94317405856
Meeting ID: 943 1740 5856
Call-in number: 1-669-900-6833

Agenda

- Comments/Review of LAER/BACT Determinations
- Proposed Amendments to Overview, Parts A, C, and E
- Proposed New/Updates to Part B
- Proposed New/Updates to Part D
- BACT Technical Assessment for Biogas Flares
- Discussion
- Next Steps

Comments/Review of LAER/BACT Determinations

Since Last Working Group Meeting

- 30-day comment period ended on August 21, 2020
- Response to written comment letters
- Stakeholder meetings and follow-ups
- Revised LAER/BACT forms based on the received comments

Proposed Amendments to BACT Guidelines

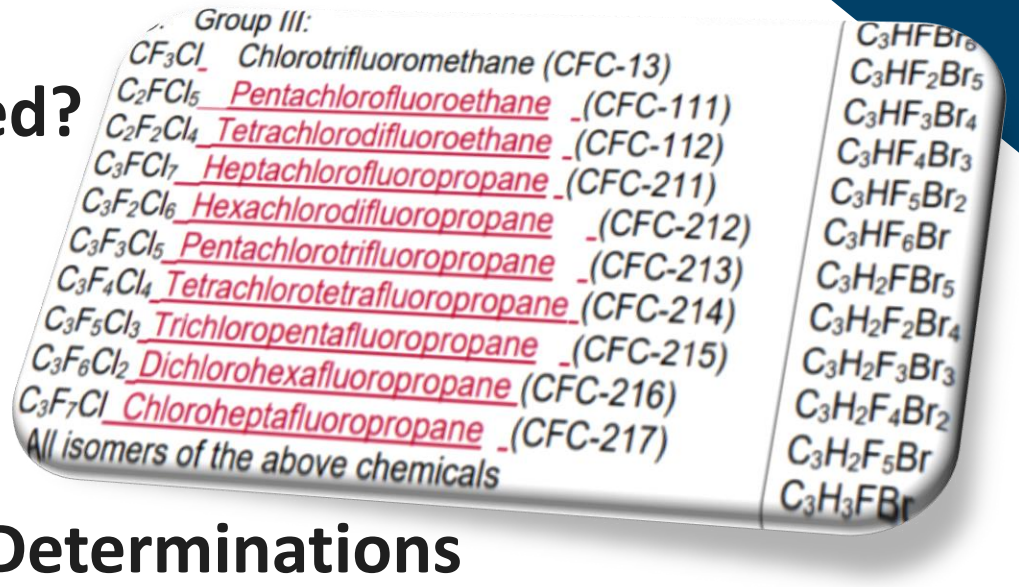
- Administrative changes to Table of Contents, Overview, Parts A, C, D, and E
  - Change all “District” and “SCAQMD” references to “South Coast AQMD
- Part C, Policy and Procedures Non-major Polluting Facilities
  - Update Maximum Cost Effectiveness Criteria in Table 5

2020 Quarter 2		
Pollutant	Average ($/ton)	Incremental ($/ton)
ROG	31,380	94,140
NOx	29,671	88,859
SOx	15,690	47,070
PM_{10}	6,991	20,817
CO	621	1,786

Overview – Proposed Amendments to BACT Guidelines

- **Chapter 3 - When is BACT Required?**

  Table 2 - Include complete names of Class I – Group III substances (ozone-depleting compound)



- **Chapter 5 - Review of Staff BACT Determinations**

  THE BACT REVIEW COMMITTEE - Update the name of two divisions

Engineering → **Engineering & Permitting** → **Public Affairs** → **Legislative, Public Affairs/Media Office**

Part A – Proposed Amendments to BACT Guidelines

- **Chapter 1 - How is LAER Determined for Major Polluting Facilities?**

  Federal PM2.5 New Source Review and SCAQMD Rule 1325 - List VOC, one of the principle precursor gases that contribute to secondary PM2.5.

Significant means in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates[3]:

Nitrogen oxides:	40 tons per year
Sulfur dioxide:	40 tons per year
Volatile organic compound (VOC):	40 tons per year[4]
$PM_{2.5}$:	10 tons per year
Ammonia:	40 tons per year[5]

- **Chapter 2 - How to Use Part B of the BACT Guidelines?**

  Updated information listed on the LAER determination form.

Part B- LAER/BACT Determination
Section I: New Proposed Listing

Regenerative Thermal Oxidizer (RTO), Natural Gas Fired (burner operation only)

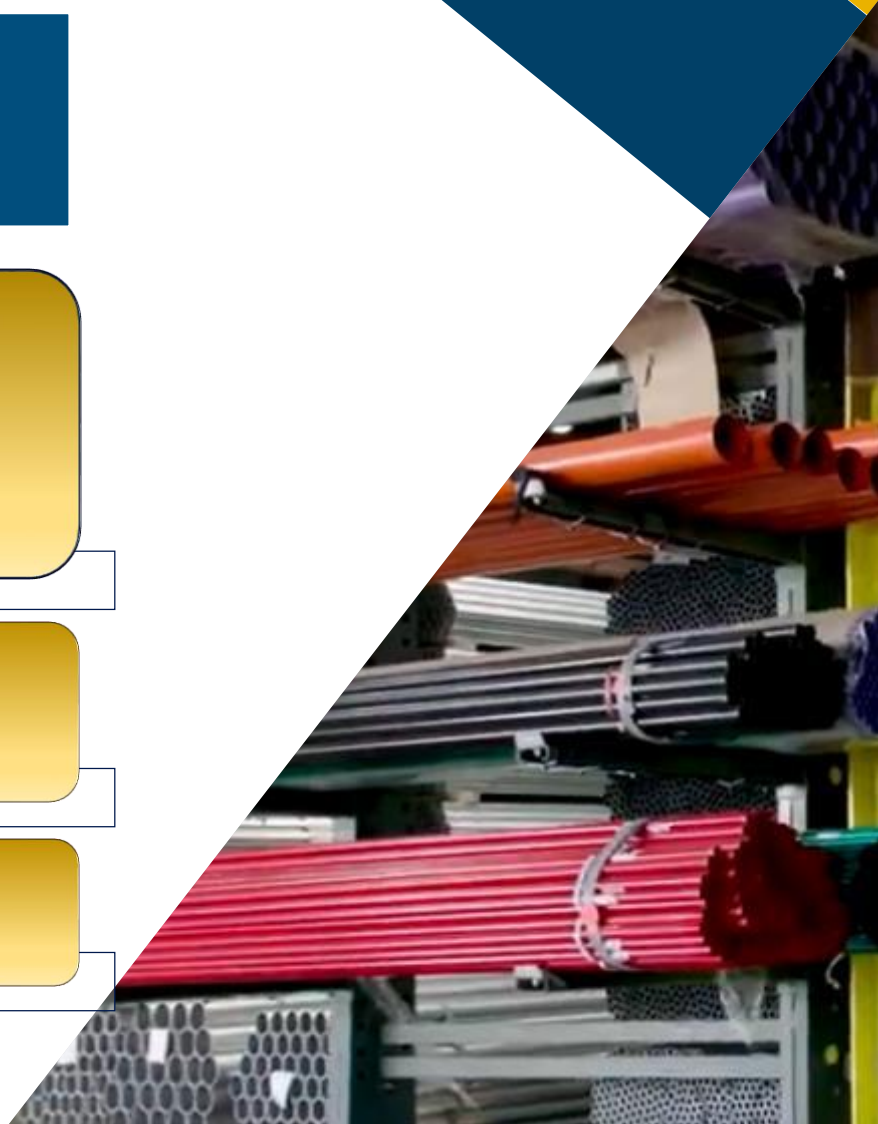
Achieved In Practice: 1 example

Prime and finish coating stations are totally enclosed and vented to the RTO

NOx limit: 30 ppmv on a dry basis @ 3% O_2

CO limit: 100 ppmv on a dry basis @ 3% O_2

Source Test showing emission limits compliance



Part B- LAER/BACT Determination
Section I: New Proposed Listing

Recuperative Thermal Oxidizer,

Natural Gas Fired (non-process emissions)

Achieved In Practice: 1 example

Venting adhesive coater ovens

NOx limit: 30 ppmv on a dry basis @ 3% O_2

CO limit: 250 ppmv on a dry basis @ 3% O_2

Source Test showing emission limits compliance

Part B- LAER/BACT Determination
Section I: New Proposed Listing

Flare (Thermal Oxidizer) - Liquid Transfer and Handling Marine Loading (non-process emissions)

Achieved In Practice: 1 example

Venting terminal tank farm

NOx limit: 30 ppmv on a dry basis @ 3% O_2

CO limit: 10 ppmv on a dry basis @ 3% O_2

Source Test showing emission limits compliance

SRC Comments and Staff Response

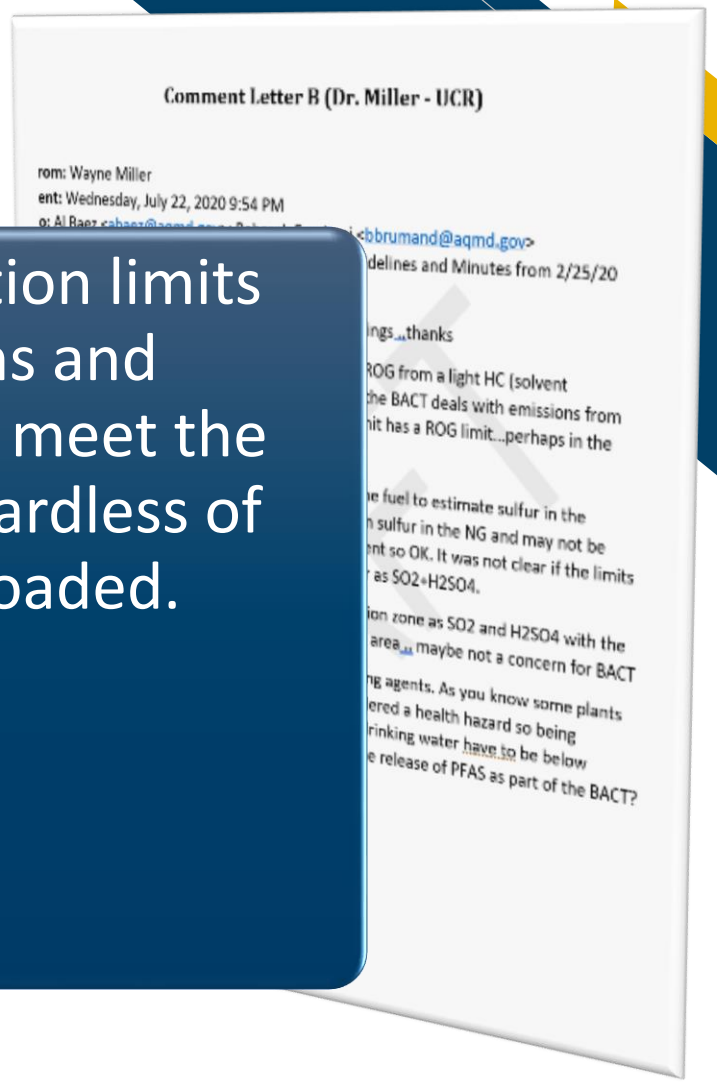
Flare (Thermal Oxidizer) - Liquid Transfer and Handling Marine Loading

Comments

Concerned about the terminal emissions as to VOC from a light HC (solvent terminal) vs a heavy HC (crude oil terminal) and if the working unit has a VOC limit.

Responses

Permit condition limits VOC emissions and facility has to meet the VOC limit regardless of the product loaded.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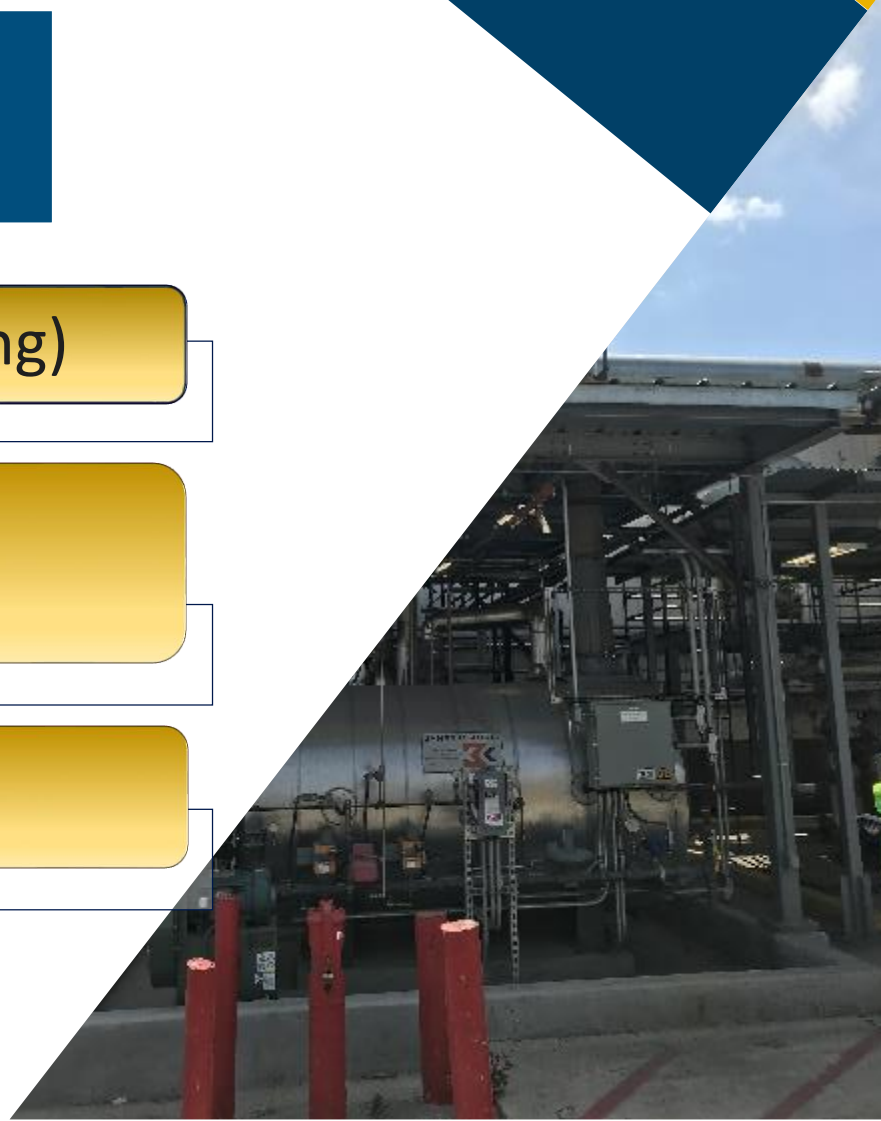
Part B- LAER/BACT Determination
Section I: New Proposed Listing

Process Heater – Non-Refinery,
Thermal Fluid Heater, Natural Gas Fired

- Achieved In Practice: 2 examples (asphalt/roofing)
- NOx limit: 9 ppmv on a dry basis @ 3% O_2
  CO limit: 100 ppmv on a dry basis @ 3% O_2
- Source Test showing emission limits compliance



Part B- LAER/BACT Determination
Section I: New Proposed Listing

I.C. Engine, Stationary, 147 & 385 BHP, Non-Emergency, Electrical Generation with NSCR

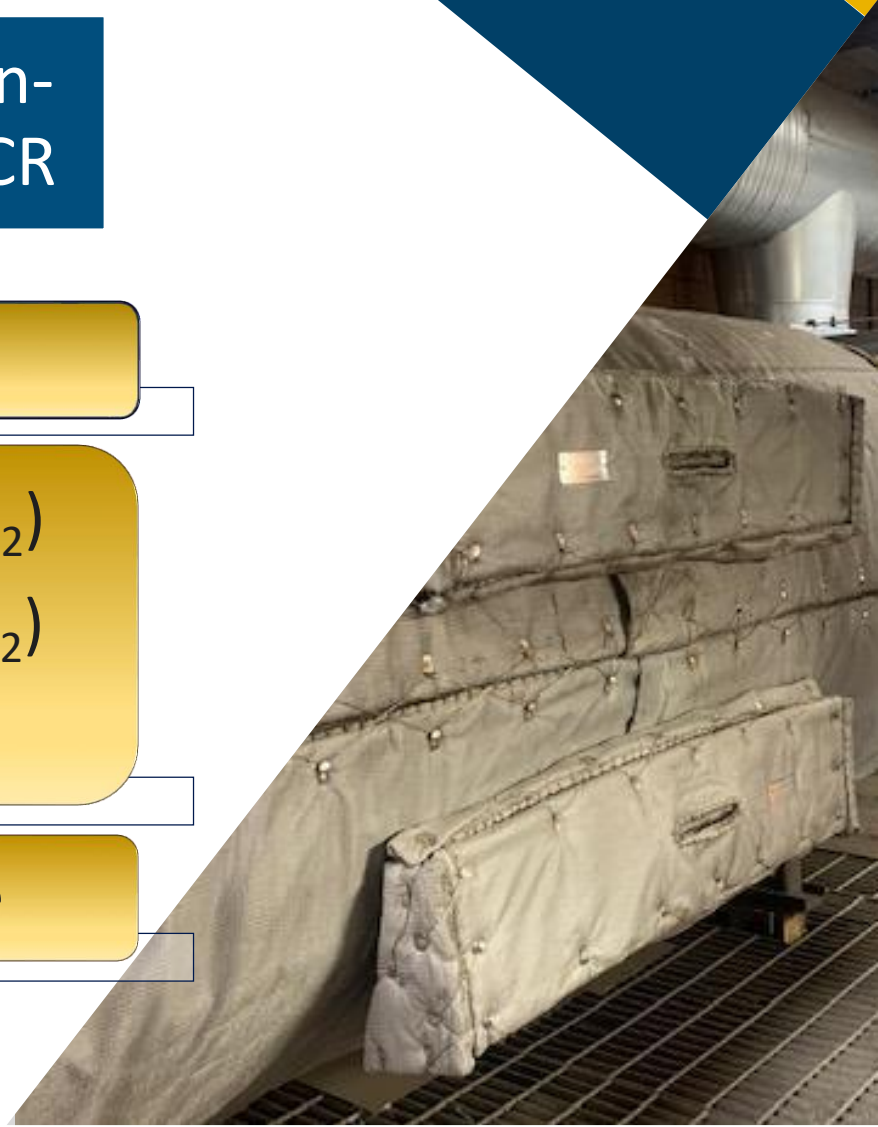
Achieved In Practice: 2 examples

NOx limit: 0.07 lb/MW-hr (2.5 ppmvd @ 15% O_2)

VOC limit: 0.10 lb/MW-hr (10 ppmvd @ 15% O_2)

CO limit: 0.20 lb/MW-hr (12 ppmvd @ 15% O_2)

Source Test showing emission limits compliance



Comments and Staff Response

I.C. Engine, Stationary, Non-Emergency, Electrical Generation with NSCR

Comments

LAER/BACT Determination Form

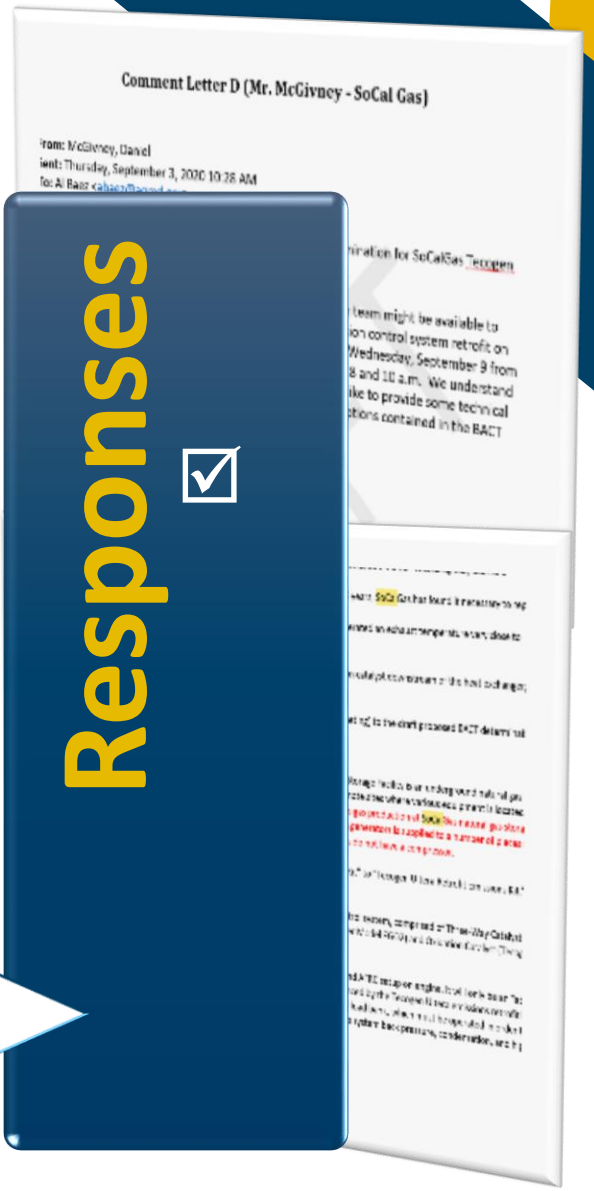
Section 1. Equipment Information

- Revise the function description:

  There is no gas production at SoCalGas natural gas storage facilities.

  Electricity generated by these engine-driven generators is supplied to a number of pieces of equipment, but not exclusively to compressors.

Responses ☑



Comments and Staff Response

I.C. Engine, Stationary, Non-Emergency, Electrical Generation with NSCR

Comments

Section 1. Equipment Information

- Modify the name for Tecogen system:

  From “Tecogen Ultra Emissions Kit” to “Tecogen Ultera Retrofit Emissions Kit.”

Responses

☑

Comments and Staff Response

I.C. Engine, Stationary, Non-Emergency, Electrical Generation with NSCR

Comments

Section 5. Control Technology

- Modify the description to clarify:

  Tecogen Ultera Emissions Retrofit Kit control system, comprised of Three-Way Catalyst (DCL) with Air/Fuel Ratio Controller (Continental Controls Air/Fuel Ratio Controller Model EGO2) and Oxidation Catalyst (Tecogen proprietary).

Responses

☑

Comments and Staff Response

I.C. Engine, Stationary, Non-Emergency, Electrical Generation with NSCR

Comments

Section 5. Control Technology

- Modify the comments:

  The old system was replaced by the Tecogen Ultera emissions retrofit kit.

  This system is retrofitted with an electrical load bank.

  Catalyst life has been short due to system back pressure, condensation, and high exhaust temperatures.

Responses ☑

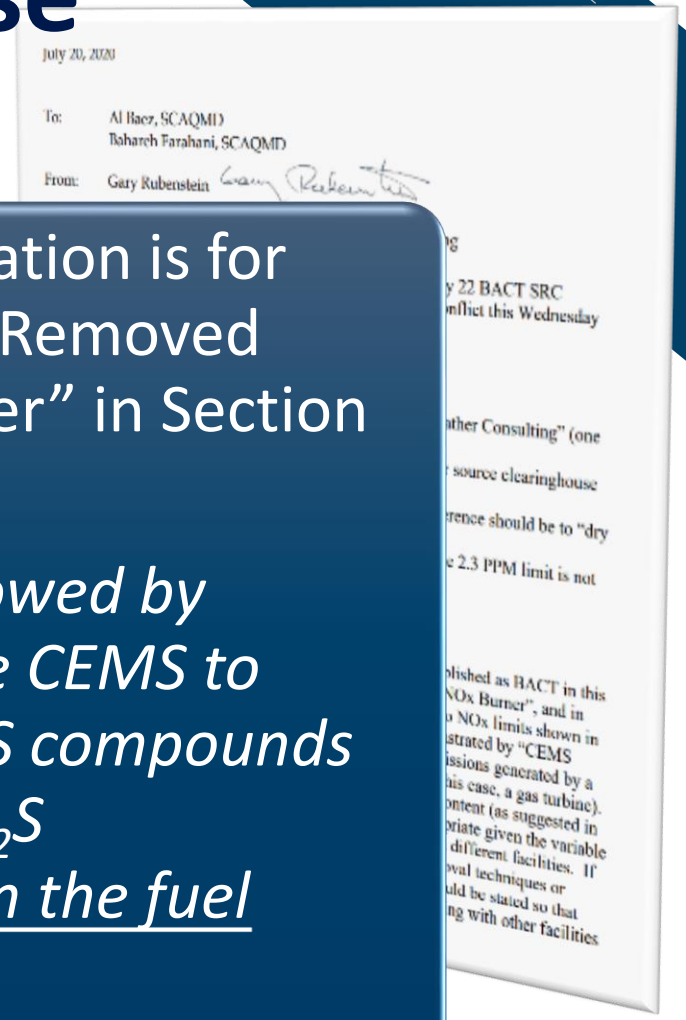
Part B- LAER/BACT Determination
Section I: New Proposed Listing

Duct Burner – Refinery Fuel Gas

- Achieved In Practice: 1 example
- Total Reduced Sulfur limit:
  40 ppm, rolling 1-hr avg. period &
  30 ppm, rolling 24-hr avg. period
- CEMS data showing emission limits compliance

SRC Comments and Staff Response

Duct Burner – Refinery Fuel Gas


July 20, 2020

To: Al Baez, SCAQMD
Bahareh Farahani, SCAQMD

From: Gary Rubenstein

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Comments

Clarify what is being established as BACT.

How compliance is demonstrated by CEMS data from the upstream source.

Responses

BACT determination is for SOx emissions. Removed "low-NOx burner" in Section 5.C.

Compliance showed by maintaining the CEMS to monitor the TRS compounds calculated as H_2S concentration in the fuel gases.

SRC Comments and Staff Response

Duct Burner – Refinery Fuel Gas

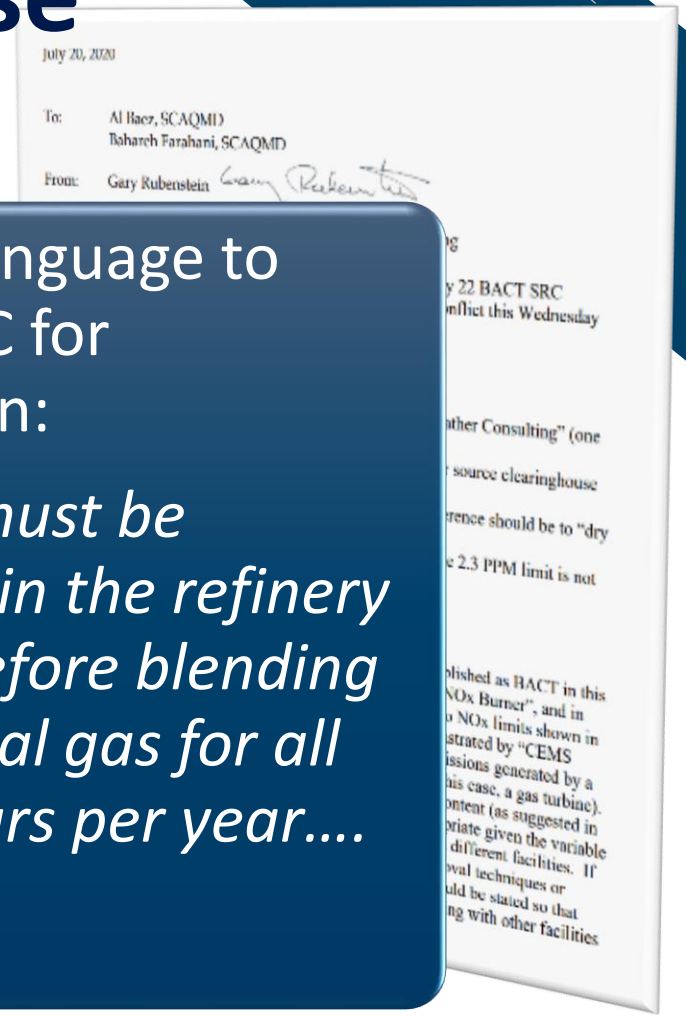
Comments

If the BACT determination is based on the use of sulfur-removal techniques or blending with pipeline-quality natural gas, those bases should be stated.

Responses

Added a language to Section 5.C for clarification:

TRS limit must be measured in the refinery fuel gas before blending with natural gas for all but 72 hours per year....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SRC Comments and Staff Response

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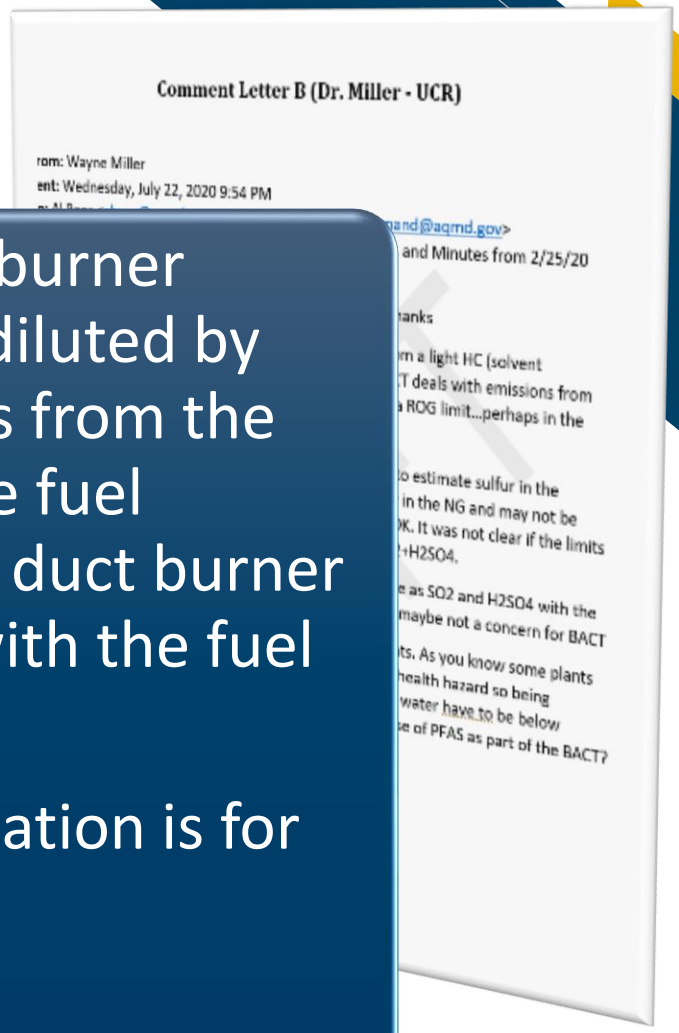
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Comments

It was not clear if the limits were for sulfur as sulfur or sulfur as H_2S or sulfur as $SO_2+H_2SO_4$.

H_2SO_4 from the exhaust contributes to PM release.

Responses

Since the duct burner exhaust gas is diluted by the exhaust gas from the gas turbine, the fuel directed to the duct burner must comply with the fuel gas H_2S limits.

BACT determination is for SOx emissions.

Part B- LAER/BACT Determination
Section I: New Proposed Listing

Aluminum Heat Treating Oven
5.47 MM Btu/hr, Billet Temp. < 970°F

- Achieved In Practice: 1 example
- NOx limit: 25 ppmv on a dry basis @ 3% O_2
- Source Test showing emission limits compliance

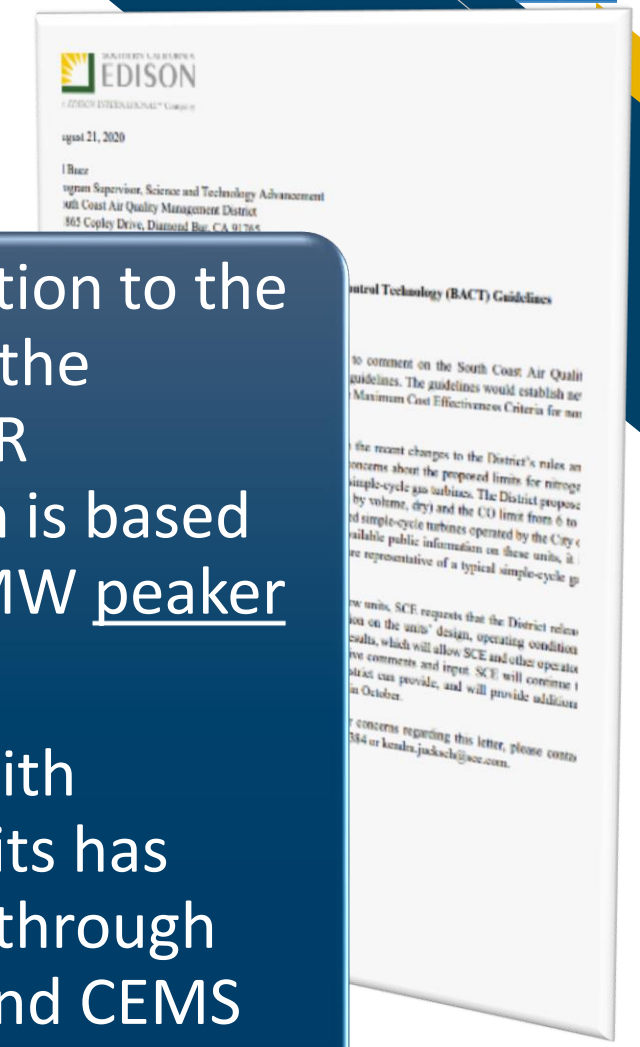
Part B- LAER/BACT Determination
Section I: Proposed Listing Update

Gas Turbine – Simple Cycle, Natural Gas

- Achieved In Practice: 1 example
- Update NOx limit from 2.5 ppmv to 2.3 ppmv
  CO limit: 4 ppmv and NH_3 slip limit: 5 ppmv on a dry basis @ 15% O_2
- Source Test results and CEMS data showing emission limits compliance

SRC Comments and Staff Response

Gas Turbine – Simple Cycle, Natural Gas


EDISON

Comments

Concerned about the available public information on the units and gas turbines' operating conditions as well as

the proposed limits for NOx and CO.

Responses

More clarification to the form to show the proposed LAER determination is based on two 49.8 MW peaker units.

Compliance with permitted limits has been verified through source tests and CEMS data.

SRC Comments and Staff Response

Gas Turbine – Simple Cycle, Natural Gas

Comments	Responses
Provide additional information on the units and Source test results.	Section 5 includes detailed information on the Gas Turbines and SCR control system. The three most recent RATA test results were added to Section 6.

Part D- BACT Determination
New Proposed Listing

Fermentation, Wine

Tanks Closed-Top ≤ 30,000 gallons

- Achieved In Practice: 1 example
  Santa Barbara APCD
- For VOC: Water Scrubber or Chiller Condenser with 67% overall control eff. averaged over length of fermentation season
- Cost-effectiveness Evaluation
- Source Test showing emission limits compliance

UV/EB Technology as Alternate BACT Option

- On 1/18/19 Stationary Source Committee (SSC) meeting, staff presented proposed updates to BACT Guidelines.
- SSC directed staff to look into the availability of UV/EB technology for categories listed in RadTech's comment letter in addition to cost data for potential BACT.
- In summer 2019, staff conducted site visits to facilities listed in RadTech's comment letter and other printing facilities using UV inks/coatings.

UV/EB Technology as Alternate BACT Option (cont'd)

- UV applications:
  - Flat Glass (mirrors)
  - Wood (cabinets)
  - Paper (Labels, packaging, signs, stationary and vinyl album covers)
- Specific to type of printing/customer driven demand
- Durability and increased production due to quick dry time
- Low VOC/higher cost
- Use of Rule Compliant UV/EB or water-based inks and coatings as alternate BACT compliance

Part D- BACT Determination
New Proposed Listing

Glass Screen Printing – Flat Glass

Achieved In Practice: 1 example

For VOC: Compliance with Rule 1145; or

Use of Rule 1145 compliant UV/EB; or

Water-based coatings

Source Test/SDS showing emission limits compliance

Part D- BACT Determination
New Proposed Listing

Spray Booth – Wood Cabinets

Encl. with automated spray nozzles

For wood cabinets < 1170 lbs VOC/month

Achieved In Practice: 1 example

For VOC: Compliance with Rule 1136; or

Use of Rule 1136 compliant UV/EB; or

Water-based coatings

Source Test/SDS showing emission limits compliance

Part D- BACT Determination
New Proposed Listing

Regenerative Thermal Oxidizer

Natural Gas Fired (burner operation only)

Achieved In Practice: 1 example

Venting guitar spray rooms

NOx limit: 30 ppmv on a dry basis @ 3% O_2

CO limit: 400 ppmv on a dry basis @ 3% O_2

Source Test showing emission limits compliance

Cost-effectiveness Evaluation

Part D- BACT Determination

Updates for Consistency with Rules and Regulations

Flare – Produced Gas, Landfill Gas, Organic Liq. Handling & Other Flare Gas

Compliance with Rule 1118.1 for NOx, CO and VOC

Fish Reduction – Cooker, Dryer, Digestor, Evaporator and Acidulation Tank

Rule 1147 does not apply

Remove NOx requirement

Coffee Roasting – Food Oven/Roaster

Rule 1147 does not apply

Remove NOx requirement

Part D- Clarifications

- **Coffee Roasting**
  - Removed NOx compliance with Rule 1147 since Rule 1147 does not apply.
  - Added Footnote 1, clarification regarding process emissions vented to Thermal Oxidizer per BACT requirement.
- **Flare**
  - Added four subcategories: Produced Gas, Organic Liquid Storage, Organic Liquid Loading and Other Flare Gas.
  - Tagged the existing and new categories to Rule 1118.1 to comply with NOx emissions requirements.
- **Gas Turbine**
  - Added "With Add-On Controls" for ammonia slip limit for consistency

Part D- Clarifications (cont'd)

- **I.C. Engines**
  - Added "6-6-2003 Rev. 1" to I.C. Engine, Portable Category (Rule 431.2).
- **Open Process Tanks: Chemical Milling (Etching) and Plating**
  - Listed "Chemical Milling Tanks" and "Chrome plating" under a new category.
  - Replaced "packed scrubber and mist suppressant" with "Compliance with Rule 1469" PM10 requirements for "Chrome plating" categories.

PM10
~~Packed Scrubber and Mist Suppressant (1988)~~ (10-20-2000) Compliance with Rule 1469 (XX-XX-2020)

- **Polyester Resin Operations**
  - Merged "Polyester Resin Operations - Molding and Casting" with "Fiberglass Operations" and renamed "Fiberglass Operations" to "Polyester Resin Operations".

SRC Comments and Staff Response

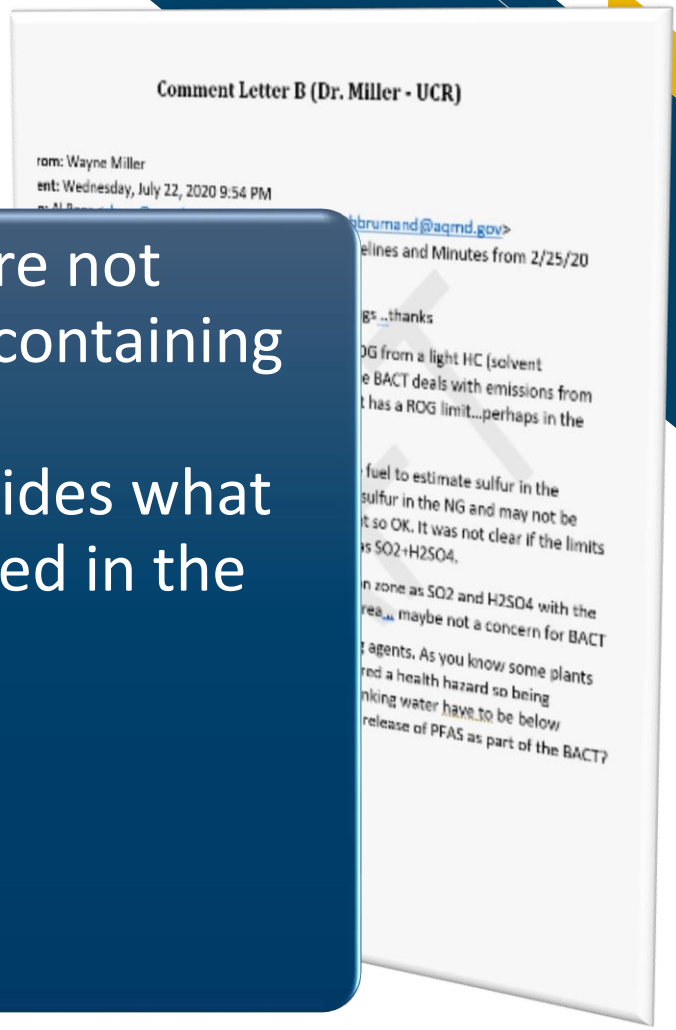
Chrome Plating

Comments

Are we looking at the release of PFAS as part of the BACT?

Responses

At this time we are not addressing PFAS containing chemical fume suppressants besides what is currently allowed in the applicable rules.



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release of PFAS as part of the BACT?

Part D- Clarifications (cont'd)

Powder Coating Booth

- Corrected throughput limit from >=37 lbs/day to >37 lbs/day to be consistent with internal policy.
- Clarified PM control options to:

  Baghouse (≥99%); or Cartridge filters (≥99%); or HEPA filters (≥99.97%)

Current wording:

	Criteria Pollutants				
Rating/Size	VOC	NOx	SOx	CO	PM_{10}
< 37 Lbs/Day Throughput					Pocket or Bag-Type Filters (10-20-2000)
≥ 37 Lbs/Day Throughput					Powder Recovery System with a Cyclone Followed by a Baghouse or Cartridge Dust Collector or HEPA Filters (≥ 99% efficiency) (1988/10-20-2000)

~~Powder Recovery System with a Cyclone Followed by a Baghouse or Cartridge /Dust Collector or HEPA Filters (≥ 99% efficiency)~~

1. Baghouse (≥99%); or
2. Cartridge Filters (≥99%); or
3. HEPA Filters (≥99.97%)

Part D- Clarifications (cont'd)

Printing (Graphic Arts)

- Changed afterburner to thermal oxidizer to be consistent with other listings in Part D.
- Replaced "Compliance with SCAQMD Rule 1147" with "thermal oxidizer BACT requirements" for NOx.
- Added "Compliance with thermal oxidizer BACT requirements" to CO requirements.
- Replaced "control" with "alternatively" for Flexographic.

~~Control~~Alternatively	For add-on control required by ~~SCAQMD~~Rule 1130(c)(5) or other South Coast AQMD~~District~~ requirement: EPA M. 204 Permanent Total Enclosure (100% collection) vented to ~~afterburner~~ thermal oxidizer

Part D- Clarifications (cont'd)

- **Printing (Graphic Arts)**
  - Lithographic or Offset, Heatset:
    - Removed "Control" listing and include existing requirement for Oven vented to thermal oxidizer under VOC.

Lithographic or Offset, Heatset	Low VOC Fountain Solution (≤ 8% by Vol. VOC); Low VOC (≤ 100 g/l) Blanket and Roller Washes; Oil-Based or UV-Curable Inks; and Compliance with ~~SCAQMD~~Rules 1130 and 1171 (2-2-18) Oven Vented to a thermal oxidizer (≥ 0.3 Sec. Retention Time at ≥ 1400 ^{0}F; 95% Overall Efficiency) (10-20-2000)	Compliance with Thermal Oxidizer BACT requirements		Compliance with Thermal Oxidizer BACT	Venting to ~~an afterburner~~a thermal oxidizer (≥ 0.3 sec. Retention Time at ≥ 1400 ^{0}F)

Part D- Clarifications (cont'd)

Spray Booth

- The term "Automotive Type" was replaced by "Fully-enclosed".
- Included Rule 1147 requirement for NOx if Make-up air or heater is used (all sub-categories)
- Super Compliant Material: Replaced "<5% VOC by weight" with" 50 grams or less of VOC per liter of material" as defined in Rule 109 (b)(6).

Subcategory/ Rating/Size	VOC	NOx
Fully-enclosed~~Automotive~~, Down-Draft Type, < 667 Lbs/Month of VOC Emissions (XX-XX-2020)	Compliance with Applicable ~~SCAQMD~~Regulation XI Rules (10-20-2000)	If booth has a Make-up Air Unit or a Heater; Compliance with Rule 1147 (XX-XX-2020)

Part D- Clarifications (cont'd)

- **Thermal Oxidizer**
  - Modified the title
  - Added "Regenerative Thermal Oxidizer" subcategory with NOx and CO emissions limits.

Equipment or Process: Thermal Oxidizer (Afterburner, Regenerative Thermal Oxidizer, and Thermal Recuperative Oxidizer~~),~~) and Catalytic Oxidizer – Natural Gas Fired**

	Criteria Pollutants				
Rating/Size	**VOC**	**NOx**	**SOx**	**CO**	**PM_{10}**
Regenerative Thermal Oxidizer (xx-xx-2020)		30 ppmvd @ 3% O_2 (Burner emissions only		400 ppmvd @ 3% O_2 (Burner emissions only)	
Other Types		30 ppmvd @ 3% O_2 (Burner emissions only)			

BACT Technical Assessment

Non-Refinery Biogas Flares

- Continue to monitor new/existing organic and food waste digestion projects for NOx flare impacts due to ammonia in biogas
- CalRecycle hosting a SB 1383 Model Tools Webinar Series
- Education and outreach to adequately resource and implement the programs that will be required in the SB 1383 regulations.
- Meet periodically with E&P staff on new projects

CARB Technology Clearinghouse Update

LAER Determinations

Technology Clearinghouse Update

- To assist air districts, industry, and the public with determining BACT and T-BACT limits, Assembly Bill 617 requires CARB to establish and maintain a statewide Technology Clearinghouse. Air districts are required to use this clearinghouse when updating their BACT determinations for stationary sources.
- CARB has also created a BACT guideline tool which allows users to view guideline documents, which contain an overview of emissions limits and associated controls that may be required for a source type.
- South Coast AQMD staff has been providing input and LAER determinations to CARB.
- Additional information can be found at: https://ww2.arb.ca.gov/technology-clearinghouse/project-components-and-release-dates

South Coast AQMD

Next Steps

January 2021
Stationary Source Committee Meeting

February 2021
Governing Board Meeting

Thank You.

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