air pollution control district
SANTA BARBARA COUNTY

Agenda Date: June 20, 2019
Agenda Placement: Regular
Estimated Time: 20 Min.
Continued Item: No

# Board Agenda Item

TO: Air Pollution Control District Board

FROM: Aeron Arlin Genet, Air Pollution Control Officer

CONTACT: Timothy Mitro, Air Quality Engineer (961-8883)

SUBJECT: Proposed Amendments to Rule 361, Small Boilers, Steam Generators and Process Heaters, and Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers, Steam Generators and Process Heaters

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**RECOMMENDATION:**

That the Board:

1. Hold a public hearing to receive testimony on the proposed amendments to Rule 361, Small Boilers, Steam Generators and Process Heaters, and Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers, Steam Generators and Process Heaters;

2. Adopt the resolution included as Attachment 1 that contains the following action items:

   a. Adopt the California Environmental Quality Act (CEQA) Findings that include a determination that an Addendum has been prepared pursuant to CEQA and the Addendum together with the Final Environmental Impact Report (EIR) for the 2010 Clean Air Plan has been reviewed and considered by the Board prior to approval of this project;

   b. Adopt the General Rule Findings in support of the proposed rule amendments pursuant to Health and Safety Code section 40727 regarding necessity, authority, clarity, consistency, nonduplication, and reference; and

   c. Adopt the proposed amendments to Rules 361 and 342.

## BACKGROUND:

The District's Governing Board initially adopted Rule 342 in 1992 and Rule 361 in 2008. Rules 361 and 342 are prohibitory rules that regulate oxides of nitrogen (NOx) and carbon monoxide (CO) emissions from boilers, steam generators, and process heaters with a rated heat input capacity greater than 2 million British thermal units per hour (MMBtu/hr). There are approximately 200 of these units within Santa Barbara County, and they are typically found at larger commercial, institutional, and industrial facilities. The District's 2016 Ozone Plan and the revised nonattainment-transitional control measure implementation schedule included a commitment to achieve NOx emission reductions from boilers, steam generators, and process heaters in this size category.

In December 2018, as required by Assembly Bill (AB) 617, your Board also adopted a Best Available Retrofit Control Technology (BARCT) Rule Development Schedule, in order to meet the BARCT implementation requirements for industrial sources that were subject to California's Cap-and-Trade Regulation as of January 2017.

## DISCUSSION:

The proposed amendments to Rules 361 and 342 are designed to lower the NOx limits for newly installed and modified boilers, steam generators, and process heaters. The new NOx standards apply to new and modified units only (with the exception of the six "AB 617 industrial sources")[1], and would take effect on January 1, 2020. The amendments are based on similar requirements that have been implemented in other air districts throughout California for the last 5 years.

The amendments also include requirements to meet BARCT standards by a date-certain for units that are part of an AB 617 industrial source. There are six AB 617 industrial sources in Santa Barbara County. The proposed amendments to Rules 361 and 342 will fulfill the District's commitment to conduct rulemaking for this source category, to ensure that BARCT requirements are implemented at the AB 617 industrial sources by December 31, 2023.

A detailed description of the rule development process for these proposed rule amendments is provided in a staff report that is included as Attachment D to the Board Resolution.

## IMPACTS TO THE REGULATED COMMUNITY:

Since boilers, steam generators, and process heaters are found throughout the commercial and industrial sector, a wide range of businesses that use the equipment are affected. Boilers can be found at hotels, schools, government buildings, manufacturing facilities, and oil & gas processing facilities. The amendments to Rules 361 and 342 will have a fiscal impact on end-users when they purchase a new unit; new equipment meeting the ultra low-NOx standard cost approximately 15-25% more than equipment with higher emissions.

[1] AB 617 Industrial Sources are further described in the attached staff report.

As mentioned earlier, the rules do not require businesses to replace their equipment (with the exception of a few of the AB 617 industrial sources). Most units will be phased-out through their natural attrition, which can take between 10-15 years. When this occurs, the rule amendments will require the operator to replace the equipment with ultra low-NOx units.

The cost-effectiveness values for the proposed amendments to Rules 361 and 342 range from $12,000 to $20,800 per ton of NOx reduced, depending on the size of the unit being replaced. These cost-effectiveness values are within the range of previously-adopted boiler prohibitory rules, and so the proposed amendments to Rules 361 and 342 are considered to be cost-effective.

## IMPACTS TO THE DISTRICT BUDGET:

The District does not envision substantive changes to fee revenues or staffing requirements due to the proposed rule amendments. Current staffing levels will be sufficient for inspections and industry outreach programs to implement the new rule provisions.

## PUBLIC REVIEW:

The District held a public workshop on the draft amendments on March 14, 2019 at the City Council Chambers in Solvang. The workshop was attended by many of the affected sources, and the public was invited to submit written comments by March 28, 2019.

The District brought the draft revisions to the Community Advisory Council (CAC) on May 1, 2019. The draft revisions received unanimous support from the attending CAC members, and the CAC recommended that the District Board adopt the proposed amendments to Rules 361 and 342. The rule package was publicly noticed on May 19, 2019, and the public was invited to this Board Hearing to provide input. Since the rule package was publicly noticed, minor changes were made to the proposed rule amendments. These changes were reformulations of words to say the equivalent of the same thing as had been circulated to the public.

## CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA):

The California Environmental Quality Act (CEQA) requires environmental review for the proposed amendments to Rules 361 and 342. The District is the CEQA lead agency for this project. Revisions to Rules 361 and 342 were examined in the EIR for the 2010 Clean Air Plan, which concluded that the implementation of the revised rule requirements would not result in any significant environmental impacts. The EIR may be read and reviewed online on the District's website at www.ourair.org/planning-clean-air. A hardcopy of the EIR is also available for review at the District office.

Pursuant to Section 15168(c) of the State CEQA Guidelines, the proposed amended rules were examined in the light of the program EIR for the 2010 Clean Air Plan. The District determined that preparation of an addendum to the existing environmental document is appropriate. The addendum to the 2010 Clean Air Plan EIR is provided in Attachment A to the Board Resolution.

**ATTACHMENTS:**

1) District Board Resolution for adopting the Proposed Amendments to Rule 361, Small Boilers, Steam Generators and Process Heaters, and Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers, Steam Generators and Process Heaters, which includes the following:
    A. Addendum to the 2010 Clean Air Plan EIR for the 2019 Amendments to Rules 361 and 342
    B. California Environmental Quality Act (CEQA) Findings
    C. General Rule Findings
    D. Staff Report
    E. Proposed Rule 361
    F. Proposed Rule 342

ATTACHMENT #1

Resolution in the Matter of Amending
Rule 361, Small Boilers, Steam Generators and Process Heaters,
and
Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers,
Steam Generators and Process Heaters

**RESOLUTION OF THE BOARD OF DIRECTORS OF**

**THE SANTA BARBARA COUNTY**

**AIR POLLUTION CONTROL DISTRICT**

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|---|---|
| IN THE MATTER OF AMENDING RULE 361, SMALL BOILERS, STEAM GENERATORS AND PROCESS HEATERS, AND RULE 342, CONTROL OF OXIDES OF NITROGEN (NOx) FROM BOILERS, STEAM GENERATORS AND PROCESS HEATERS | APCD RESOLUTION NO. _____ |

## RECITALS

**WHEREAS,** the Air Pollution Control District Board of the County of Santa Barbara ("Board") is authorized to adopt, amend, or repeal rules and regulations pursuant to Health and Safety Code section 40725 et seq; and

**WHEREAS,** pursuant to Health and Safety Code section 40001, the Board is required to adopt and enforce rules and regulations to achieve and maintain the state and federal ambient air quality standards; and

**WHEREAS,** the Board has determined that a need exists to amend Rule 361, Small Boilers, Steam Generators and Process Heaters, and Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers, Steam Generators and Process Heaters to implement Health and Safety Code sections 40914, 40918, 40924(b) & 40925.5 under the District's 2016 Ozone Plan. The proposed amendments to Rules 361 and 342 implement two 2016 Ozone Plan control measures that control emissions of oxides of nitrogen; and

**WHEREAS,** California Health and Safety Code Section 40920.6, as amended by California Assembly Bill 617 (2017), requires each California air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for the implementation of Best Available Retrofit Control Technology on or before January 1, 2019, and the schedule must provide for the implementation of Best Available Retrofit Control Technology by the earliest feasible date, but in any event, not later than December 31, 2023; and

**WHEREAS,** the Assembly Bill 617 Best Available Retrofit Control Technology Rule Development Schedule, as adopted by the Board on December 20, 2018, included a commitment to conduct rulemaking procedures for Rules 361 and 342 in order to implement Best Available Retrofit Control Technology at the six industrial sources in Santa Barbara County that were subject to the California Greenhouse Gas Cap-and-Trade Regulation as of January 1, 2017. The proposed amendments to Rules 361 and 342 will fulfill that commitment; and

**WHEREAS,** pursuant to the California Environmental Quality Act, the District has prepared an Addendum to the Environmental Impact Report for the 2010 Clean Air Plan (State Clearing House No. 2010071014), as set forth in Attachment A, to address some minor changes and additions to the EIR associated with the amendments to Rules 361 and 342.

**NOW, THEREFORE, IT IS HEREBY RESOLVED,** as follows:

1. This Board has held a hearing and accepted public comments in accordance with the requirements of Health and Safety Code section 40725 et seq.
2. Prior to approving the proposed amendments to Rules 361 and 342, Board members have reviewed and considered the Addendum to the Final Environmental Impact Report for the 2010 Clean Air Plan, as set forth in Attachment A to this resolution, with the Final Environmental Impact Report for the 2010 Clean Air Plan.
3. The California Environmental Quality Act ("CEQA") findings, as set forth in Attachment B to this resolution, are hereby adopted as findings of this Board pursuant to CEQA, the State CEQA Guidelines, and the Environmental Review Guidelines for the Santa Barbara County Air Pollution Control District.
4. The General Rule findings, as set forth in Attachment C of this resolution, are hereby adopted as findings of this Board pursuant to Health and Safety Code section 40727.
5. The Staff Report, as set forth in Attachment D of this resolution, has been presented to this Board and reviewed and considered prior to approving this project.
6. The amendments to Rule 361, Small Boilers, Steam Generators and Process Heaters, as set forth in Attachment E of this resolution, are hereby adopted as amendments to the rules of the Santa Barbara County Air Pollution Control District pursuant to Health and Safety Code section 40725 et seq.

7. The amendments to Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers, Steam Generators and Process Heaters, as set forth in Attachment F of this resolution, are hereby adopted as amendments to the rules of the Santa Barbara County Air Pollution Control District pursuant to Health and Safety Code section 40725 et seq.
8. The Board authorizes the Control Officer to transmit the amended rules to the California Air Resources Board as a revision to the State Implementation Plan. Additionally, the Board authorizes the Control Officer to do any related acts required to obtain necessary approvals of the rule by the California Air Resources Board and the United States Environmental Protection Agency.

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**PASSED, APPROVED AND ADOPTED** by the Air Pollution Control District Board of the Santa Barbara County, State of California, this ___ day of _____, _____, by the following vote:

Ayes:

Noes:

Abstain:

Absent:

SANTA BARBARA COUNTY
AIR POLLUTION CONTROL DISTRICT

By _____
Chair

**ATTEST:**

AERON ARLIN GENET
Clerk of the Board

By _____
Deputy

**APPROVED AS TO FORM:**

MICHAEL C. GHIZZONI
Santa Barbara County Counsel

By Rachel Van Mullen
Deputy

Resolution in the Matter of
Rule 361, Small Boilers, Steam Generators and Process Heaters,
and
Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers,
Steam Generators and Process Heaters

ATTACHMENT #A

Addendum to the 2010 Clean Air Plan EIR for the
2019 Amendments to Rules 361 and 342

**Addendum to the 2010 Clean Air Plan EIR for the 2019 Amendments to Rules 361 and 342**

**Staff Contact:** Tim Mitro, Air Quality Engineer (961-8883)
**Date:** June 10, 2019

## 1.0 BACKGROUND

The Santa Barbara County Air Pollution Control District (District) proposes to amend District Rules 361 and 342, which affect boilers, water heaters, process heaters, and steam generators that are installed or modified within the District boundaries. Amendments to both Rules 361 and 342 were included as control measures in the District's 2016 Ozone Plan. When the District's attainment status officially shifted from nonattainment to nonattainment-transitional in 2017, the District Board revised the 2016 Ozone Plan's control measure implementation schedule, and the Rule 361 and 342 amendments were retained in that revised schedule.

The 2016 Ozone Plan (2016 Plan) is the eighth triennial update to the initial state Air Quality Attainment Plan adopted by the District Board of Directors in 1991 (other updates were done in 1994, 1998, 2001, 2004, 2007, 2010, and 2013). Each of the Santa Barbara County plan updates have implemented an "all feasible measures" strategy to ensure continued progress towards attainment of the state ozone standards. Many of the measures have already been implemented, and have substantially reduced ozone precursor pollutants (nitrogen oxides, or NOx, and reactive organic compounds, or ROCs).

The District prepared a program Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) to analyze the potential environmental impacts of implementing the 2010 Clean Air Plan (State Clearinghouse #2010071014), including implementation of all of the control measures proposed for adoption in the 2010 Plan. No significant impacts were identified, and no mitigation measures were required in the 2010 Clean Air Plan EIR.

This document serves as an ***Addendum to the 2010 Clean Air Plan EIR*** that addresses some minor changes and additions to the EIR related to the 2019 amendments to Rules 361 and 342.

## 2.0 REASON FOR THIS *ADDENDUM TO THE 2010 CLEAN AIR PLAN EIR*

The District's 2010 Clean Air Plan (2010 Plan) included control measure options for numerous District rules. These control measures generally focused on two types of control strategies:

1) Reducing the allowable ROC content of cleaning solvents and other products, and
2) Lowering the NOx emission limits for combustion units.

The project description in the 2010 Plan EIR, Section 2, includes a summary of the proposed control measures and how they might be implemented. The EIR analyzed the potential for environmental impacts in several different issue areas, including air quality, biological resources, hazards-risk of upset, hazardous materials, water resources, land use/planning, noise & nuisance, public service, transportation/circulation, utilities/energy, and global climate change/greenhouse gas emissions. As documented in the 2010 Plan EIR, no significant environmental impacts were anticipated to occur as a result of implementing the control measures. The 2010 Plan EIR was finalized and certified by the District Board in January 2011.

The 2010 Plan EIR was designed to act as a program EIR which, pursuant to CEQA Guidelines, may be prepared on a series of actions that can be characterized as one large project and are related "…in connection with issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program."[1] The use of the program EIR with later activities must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.[2] Both the 2013 Clean Air Plan and the 2016 Ozone Plan relied on the 2010 Clean Air Plan EIR to satisfy CEQA requirements; CEQA addendums to the 2010 Clean Air Plan EIR were prepared for both of these projects at the time of their adoption.

In June 2019, the District Board will consider whether to adopt the amendments to District Rules 361 and 342. Staff evaluated the difference between the control measure descriptions that were evaluated in the 2010 Plan EIR and the revised control measures that will be considered by the District Board in June 2019, to assess whether the difference would result in new significant environmental impacts. The District found that there were minor technical changes in the 2019 amendments to Rules 361 and 342 that were not examined in the 2010 Plan EIR, but none of the conditions described in State CEQA Guidelines Section 15162 or Section 15163 calling for the preparation of a subsequent EIR or supplement to an EIR are anticipated to result from these differences. Therefore, pursuant to Section 15164 of the State CEQA Guidelines, the District prepared this Addendum to the 2010 Plan EIR.

## 3.0 DIFFERENCES BETWEEN THE 2010 CLEAN AIR PLAN CONTROL MEASURES AND THE PROPOSED RULE AMENDMENTS

The 2010 Plan EIR adequately describes the majority of the revisions to District Rules 361 and 342 and the associated environmental impacts. The following discussion presents the differences between control measures that were included in the 2010 Plan and the proposed rule amendments.

1) LOWER NOX EMISSION LIMIT

   The 2010 Plan evaluated the potential emission limits for Rules 361 and 342 to be 15 parts per million (ppm) NOx. These limits could be achieved using a combination of ultra-low NOx burners and flue gas recirculation. Since 2010, there have been further advancements in ultra-low NOx burners, and the technology has been available and successfully deployed in many regions in the state. These burners can now consistently reach NOx levels between 7-12 ppm, instead of 15 ppm. The proposed amendments to Rules 361 and 342 reflect these lower NOx limits because the limits are feasible and have been achieved in practice in other California Air Districts. The fact that the proposed rule amendments include lower NOx emission limits compared to the 2010 Plan does not create any new significant impacts; the same equipment modifications are used to meet the lower limits.

[1] CEQA Guidelines Section 15168(a)(3)

[2] CEQA Guidelines Section 15168(c)

2) "MODIFICATION" OR "MODIFY" DEFINITION

The definition for "modification" or "modify" is included in the proposed amendments to Rule 342 so that operators don't circumvent the rule requirements by changing out a burner with another high-emitting burner, or by bringing older equipment into the District.[3] Adding new definitions to refine the compliance obligations of owners and operators is common in rule development proceedings, and these more specific and detailed changes are not evaluated in a program level EIR. A program-level EIR focuses on the general concept of the emission reduction technology and analyzes the impact of control measures at a programmatic level. However, the EIR addressed the impacts from replacing the existing equipment with new equipment that uses the lower NOx technologies, and the new definition of "modification" describes one of the situations in which the replacement needs to occur. Adding the definition is consistent with other District boiler rules (Rules 360 and 361), and clarifying the compliance obligation does not create any new significant impacts.

3) AB 617 BARCT RULE AMENDMENTS

In accordance with Assembly Bill (AB) 617, the District is required to implement Best Available Retrofit Control Technology (BARCT) at the AB 617 industrial sources no later than December 31, 2023. The District added compliance timelines to the rules for the handful of units that are subject to this new state requirement. These timelines were not included or evaluated in the 2010 Plan EIR.

The program EIR focuses on the general concept of the emission reduction technology, and analyzes the impact of control measures at a programmatic level. As noted above, setting the compliance timelines for owners and operators of equipment is common in rule development proceedings. Furthermore, since the BARCT emission limits are the same as the proposed emission limits for newly installed and modified units, the BARCT requirements do not affect the overall effectiveness of the control measure. The AB 617 BARCT amendments do not create any new significant impacts.

## 4.0 CONCLUSION

Pursuant to Section 15164 of the State CEQA Guidelines, and the explanation set forth above, the District has prepared this Addendum to the 2010 Clean Air Plan EIR. Section 15164(a) states that, *"The lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred."* As documented in this addendum, the 2019 amendments to Rules 361 and 342 will not result in significant new environmental impacts, as compared to the project that was analyzed in the 2010 Clean Air Plan EIR. No new mitigation measures are required.

[3] Rule 361, as adopted in 2008, already contained the definition for "modify." This section is only relevant to Rule 342.

Resolution in the Matter of
Rule 361, Small Boilers, Steam Generators and Process Heaters,
and
Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers,
Steam Generators and Process Heaters

ATTACHMENT #B

CEQA Findings

# CEQA FINDINGS

FINDINGS PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES SECTIONS 15162 AND 15164

The Board finds and certifies that:

- The potential environmental impacts of these rule amendments were found to be adequately described and analyzed in the 2010 Clean Air Plan Environmental Impact Report (State Clearinghouse No. 2010071014, dated January 2011). An Addendum was prepared for this project and is appropriate because changes and additions to the EIR are necessary but none of the conditions in CEQA Guidelines Section 15162 have occurred.

- The adoption and implementation of amended Rules 361 and 342 will not have significant adverse impacts on the environment.

- The Board has considered the Addendum together with the final EIR and finds that a subsequent EIR shall not be prepared because the project changes described in the Addendum will not create any new significant effects or a substantial increase in the severity of previously identified significant effects on the environment nor present new information of substantial importance pursuant to the State CEQA Guidelines Section 15162.

- No relaxation in meeting ambient air quality standards for ozone will result. No cross-media impacts were identified.

- Pursuant to §15164 of the State California Environmental Quality Act Guidelines, no new effects will occur and no new mitigation measures are required beyond those considered in the 2010 Clean Air Plan Environmental Impact Report.

- The documents and other materials that constitute the record of proceedings upon which this decision is based are located at the Air Pollution Control District, 260 North San Antonio Road, Suite A, Santa Barbara, CA 93110.

Resolution in the Matter of
Rule 361, Small Boilers, Steam Generators and Process Heaters,
and
Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers,
Steam Generators and Process Heaters

ATTACHMENT #C

General Rule Findings

# GENERAL RULE FINDINGS

Pursuant to California Health and Safety Code section 40727, the Board makes the following findings for the amendments to District Rules 361 and 342.

## Necessity

The Board determines that it is necessary to amend Rules 361 and 342 in order to comply with the legal mandate in Health and Safety Code section 40910 to reduce air pollution to such an extent as to expeditiously achieve and maintain the air quality health standards.

## Authority

The Board is authorized under state law to adopt, amend, or repeal rules and regulations pursuant to Health and Safety Code sections 40000, 40001, and 40725 through 40728, which assigns to local and regional authorities the primary responsibility for the control of air pollution from all sources other than exhaust emissions from motor vehicles. Additionally, pursuant to Health and Safety Code section 40702, the District Board is required to adopt rules and regulations and to do such acts as are necessary and proper to execute the powers and duties granted to it and imposed upon it by State law.

## Clarity

The Board finds that proposed Rules 361 and 342 are sufficiently clear. The rules were publicly noticed and reviewed by the Community Advisory Council. The rules are written or displayed so that its meaning can be easily understood by persons directly affected by it.

## Consistency

The Board determines that proposed Rules 361 and 342 are consistent with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or regulations.

## Nonduplication

The Board finds that the proposed Rules 361 and 342 do not impose the same restrictions as any existing state or federal regulation, and the proposed rules are necessary and proper to execute the powers and duties granted to, and imposed upon, the District.

## Reference

The Board finds that it has the authority under state law to amend proposed Rules 361 and 342 pursuant to Health and Safety Code section 39002. Health and Safety Code section 39002 assigns to local and regional authorities the primary responsibility for the control of air pollution from all sources other than exhaust emissions from motor vehicles. Additionally, pursuant to Health and Safety Code section 40702, the Board is required to adopt rules and regulations and to do such acts as are necessary and proper to execute the powers and duties granted to it and imposed upon it by State law.

# Resolution in the Matter of
# Rule 361, Small Boilers, Steam Generators and Process Heaters,
# and
# Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers, Steam Generators and Process Heaters

ATTACHMENT #D

Staff Report

# SANTA BARBARA COUNTY
# AIR POLLUTION CONTROL DISTRICT

## Proposed Staff Report for:

**Amended Rule 361. Boilers, Steam Generators, and Process Heaters (Between 2 – 5 MMBtu/hr)**

**Amended Rule 342. Boilers, Steam Generators, and Process Heaters (5 MMBtu/hr and greater)**

**Date: June 13, 2019**


Aeron Arlin Genet
Air Pollution Control Officer

Prepared By:
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Our Mission

*Our mission is to protect the people and the environment of Santa Barbara County from the effects of air pollution.*

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# 1. EXECUTIVE SUMMARY

Rules 361 and 342 are prohibitory rules that regulate oxides of nitrogen (NOx) and carbon monoxide (CO) emissions from boilers, steam generators, and process heaters with a rated heat input capacity greater than 2 million British thermal units per hour (MMBtu/hr). The proposed amendments are designed to reduce the applicable NOx limits of these units when they are installed, replaced, or modified. Beginning on January 1, 2020, newly manufactured, installed, and modified equipment units need to meet a lower NOx emission limit, within the range of 7 to 40 parts per million by volume (ppm), depending on the size of the unit and which fuel is being burned. The amendments also include requirements to meet Best Available Retrofit Control Technology (BARCT) standards by a date-certain, for units that are part of an "Assembly Bill (AB) 617 industrial source." There are six AB 617 industrial sources in Santa Barbara County.

The amendments fulfill a commitment from the Santa Barbara County Air Pollution Control District's (District's) 2016 Ozone Plan, and they are based on similar requirements that have been implemented in other air districts throughout California for the last 5 years. The amendments also fulfill a commitment to implement the BARCT requirements of AB 617 by December 31, 2023.

# 2. BACKGROUND

## 2.1 Source Category Description

There are many of types of boilers, steam generators, and process heaters subject to Rules 361 and 342. They range from larger boilers that produce high pressure steam in industrial settings to smaller units that are used to provide domestic hot water for a school or hotel. Other typical applications for this source category may include: oil & gas production, space heating, food processing, garment laundering, or manufacturing. All of these devices function by combusting a fuel and transferring the heat of combustion to water or a process stream.

The two main pollutants of concern for a combustion process are oxides of nitrogen (NOx) and carbon monoxide (CO). Manufacturers have already designed and focused on a number of different combustion modifications to meet the low emission limits as required in other California air districts. Combustion modification systems are typically designed to reduce thermal NOx formation by changing the flame characteristics and reducing the peak flame temperature. Some of the design principles used in low NOx burners include staged air-fuel burners and pre-mix burners, both of which provide a well-controlled, efficient combustion process with minimized emissions.

## 2.2 Rule 361 Background

The District's Governing Board initially adopted Rule 361 on January 17, 2008. Rule 361 applies to boilers, steam generators, and process heaters with a rated heat input greater than 2 MMBtu/hr and less than 5 MMBtu/hr. Prior to 2008, these medium-sized units were exempt from the requirement to obtain a Permit to Operate. However, District Rule 202 was also amended in 2008 to lower the permitting threshold from 5 MMBtu/hr to 2 MMBtu/hr.

Existing units were required to apply for a permit by April 2008, but they are not required to comply with the emission standards until January 1, 2020. This 12-year phase-out approach allowed the District to achieve NOx emission reductions without requiring the immediate replacement of any existing units. It was anticipated that the majority of existing units would be replaced during this 12-year period due to the typical life cycle of these units, and the newly installed units are required to comply with the emission standards upon installation.

The 2008 rule implemented a NOx emission limit of 30 ppm for all units, except for existing units that qualified for the low-use exemption. To verify that these emission limits are met, Rule 361 requires the operator of natural gas units to perform a NOx analyzer test every 6 months during the semiannual tune-up. If a unit is fired on a fuel other than natural gas, the unit is required to be source tested every 2 years.

The District submitted the initial rule to the California Air Resources Board (CARB) for forwarding to the Environmental Protection Agency (EPA) as an amendment to the State Implementation Plan (SIP). EPA finalized a limited approval - limited disapproval of the initially adopted Rule 361 on May 31, 2011.

### 2.3 Rule 342 Background

The District's Governing Board initially adopted Rule 342 on March 10, 1992. Rule 342 applies to boilers, steam generators, and process heaters with a rated heat input of 5 MMBtu/hr and greater. Prior to 1987, the majority of these industrial-sized units were exempt from the requirement to obtain a Permit to Operate. However, District Rule 202 was amended in 1987 to lower the permitting threshold from 250 MMBtu/hr to 10 MMBtu/hr. Rule 202 was further amended in 1992 to lower the permitting threshold from 10 MMBtu/hr to 5 MMBtu/hr.

The 1992 rule implemented a NOx emission limit of 30 ppm for all gaseous-fired units and 40 ppm for non-gaseous-fired units, unless the unit qualified for the low-use exemption. To verify that these emission limits are met, Rule 342 requires the operator of perform a source test every 2 years.

Rule 342 was also amended in 1997, but this was purely an administrative reference change due to the District's 1997 New Source Review amendments. The District submitted the 1997 version of Rule 342 to the California Air Resources Board for forwarding to the EPA as an amendment to the State Implementation Plan. EPA finalized their approval of Rule 342 on September 24, 1999.

### 2.4 The 2016 Ozone Plan

Ground level ozone is a secondary pollutant formed from photochemical reactions of the precursor pollutants oxides of nitrogen (NOx) and reactive organic compounds (ROC) in the presence of sunlight. Ozone is a strong irritant that adversely affects human health and damages crops and other environmental resources. Both short-term and long-term exposure to ozone can irritate and damage the human respiratory system, resulting in:

- Decreased lung function,
- Development and aggravation of asthma,
- Increased risk of cardiovascular problems such as heart attacks and strokes,
- Increased hospitalizations and emergency room visits, and
- Premature deaths.

The District is in attainment for most of the Ambient Air Quality Standards, including the most recent federal 8-hour ozone standard that was adopted in 2015. However, the District is currently designated as nonattainment-transitional for the state ozone standard.

As required by the California Clean Air Act, the District prepared the 2016 Ozone Plan that included a schedule for implementing control measures to reduce emissions of ozone precursors and help attain the state ozone standard. The District was also required to review the 2016 Ozone Plan's rule schedule, pursuant to California Health and Safety Code section 40925.5, after being designated nonattainment-transitional in 2017. The review and revision to the rule schedule were approved by the District Board of Directors on August 17, 2017.[1]

The proposed amendments to Rules 361 and 342 were identified in the District's 2016 Ozone Plan. The District reviewed the possibility of adopting the boiler control measures in Santa Barbara County, and the measures met all of the criteria needed to be considered "feasible measures." Hence, the District's 2016 Ozone Plan and the revised nonattainment-transitional rule schedule included a commitment to achieve NOx emission reductions from these units.

Since the District is designated as nonattainment-transitional, California Health and Safety Code section 40930 also requires the District to do a cost-benefit analysis and provide justification before any new control measure is adopted. That analysis is included in Section 6 of this staff report.

### 2.5 The AB 617 BARCT Rule Development Schedule

Assembly Bill (AB) 617, enacted in July 2017, has a multitude of requirements to address the disproportionate impacts of air pollution in disadvantaged communities. One of the key components of AB 617 is to reduce air pollutant emissions from facilities that participate in the California Greenhouse Gas (GHG) Cap-and-Trade system. Cap-and-Trade is designed to limit GHG emissions, and allows facilities to comply by either reducing GHG emissions at the source or by purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG-emitting sources, and these pollutants may impact local communities that are already experiencing a disproportionate burden from air pollution.

AB 617 helps alleviate the pollution burden near these communities by requiring each air district to adopt an expedited rule development schedule for Best Available Retrofit Control Technology (BARCT) by January 1, 2019. The District's schedule was adopted at the December 20, 2018

[1] Additional information on the District's change in designation to nonattainment-transitional, and the changes to the 2016 Ozone Plan's control measure implementation schedule, can be found here: https://www.ourair.org/planning-clean-air/

Board Hearing, and Rules 361 and 342 were included on the list of measures that needed to be evaluated for BARCT. [1] The District has six facilities that have been identified as industrial sources subject to the California Cap-and-Trade requirements. These facilities are:

1) Exxon Mobil – Las Flores Canyon,
2) Exxon Mobil – Pacific Offshore Pipeline Company (POPCO),
3) Pacific Coast Energy Company (PCEC) – Orcutt Hill,
4) ERG Operating Company – Cat Canyon West,
5) Imerys Minerals California, and
6) Windset Farms.

All of these facilities, except for Las Flores Canyon, use boilers, steam generators, and process heaters that need to be evaluated under the AB 617 requirements. The Rule 361 BARCT analysis for these facilities can be found in Section 3.6, and the Rule 342 BARCT analysis can be found in Section 4.6.

[1] Additional information on the AB 617 BARCT Rule Development Schedule is available on the District's website at www.ourair.org/community-air.

# 3. PROPOSED RULE AMENDMENTS – Rule 361

## 3.1 Overview of Proposed Amendments

The District is proposing the following major amendments to Rule 361:

- Lowering the NOx emission limit for newly installed or modified gaseous-fired units from 30 ppm down to 9-25 ppm, depending on the fuel being burned;[1]
- Adding in startup and shutdown provisions; and
- Incorporating the BARCT requirements for the AB 617 industrial sources.

All of the amendments are described in further detail in their corresponding sections below.

## 3.2 Rule Title

When Rule 361 was initially adopted in 2008, it was named "Small Boilers, Steam Generators, and Process Heaters." This name, by itself, informs the reader that if you have a boiler or steam generator, you should read the rule to learn if there are any applicable requirements to your equipment unit. Yet the naming becomes more convoluted when comparing it to other District-adopted boiler rules.

Hence, the District is in the process of implementing a new naming convention to minimize the confusion between the various boiler rules. Proposed Rule 361 will be named "Boilers, Steam Generators, and Process Heaters (Between 2 – 5 MMBtu/hr)." This title creates a simplified boiler rule naming convention that conveys the applicability without having to open the rule, which will help the public quickly identify the applicable rule for their equipment unit.

## 3.3 Requirements - Emission Limits

<u>Natural gas-fired and Field gas-fired units</u>

The focus of this rule amendment is to lower the emission limits for new and modified natural gas and field gas units from 30 ppm to the 9-12 ppm NOx emission limits, beginning on January 1, 2020. To meet these lower standards, most boilers will have to be equipped with ultra-low NOx burners. Ultra-low NOx burners are designed to achieve low emissions while maintaining good flame stability and heat transfer characteristics. Furthermore, these burners may increase thermal efficiencies by reducing the amount of excess air needed for combustion. This has the added benefit of reducing fuel usage, which results in energy savings.

For most systems, a blower will be required to mix the fuel and air prior to combustion. Even atmospheric boilers, where the burners are not totally enclosed, may still need a blower to premix the fuel and air. Due to the design criteria of these atmospheric boilers, it is only feasible to have them reach the 12 ppm NOx limit, as opposed to the 9 ppm limit for non-atmospheric boilers. It is possible to reach both the 9 and 12 ppm NOx limits without the use of Flue Gas Recirculation (FGR), yet some operators may still choose to use this technology.

[1] All parts per million by volume (ppm) measurements are expressed on a dry gas basis and corrected to 3% stack gas oxygen.

Other fuels

Not all fuel types can easily meet the ultra-low NOx standard. Units that are fired on alternative fuel types, such as boilers that are fired on digester gas at a waste water treatment plant, can't easily achieve these emission levels. This is mainly due to the fluctuations or impurities in the fuel. As such, these other fuels have different standards to reflect what is feasible with the available technologies.

The proposed NOx limit for landfill gas-fired units is 25 ppm, and the proposed NOx limit for digester gas is 15 ppm. Both of these standards are based on the NOx limits for equipment subject to SCAQMD Rule 1146.1. In addition, a NOx limit of 20 ppm is proposed for liquefied propane gas or propane-fired units, which is equivalent to the emission standard in Ventura County Rule 74.15.1.

### 3.4 Startups and Shutdowns

Due to the previous deficiency that was noted by the EPA in their limited approval-limited disapproval of Rule 361, the District has added new definitions and requirements for startups and shutdowns. These changes are necessary to clearly define the startup and shutdown time frames because the emission limits of the rule do not apply during these periods. Air emissions must still be minimized during all startups and shutdowns, and the proposed provisions are consistent with the EPA policy as discussed in an EPA memorandum, dated February 15, 1983, "Policy on Excess Emissions During Startup, Shutdown, Maintenance and Malfunctions."

### 3.5 Testing & Tune-up Procedures

Rule 361, as adopted in 2008, requires the applicable units to be source tested every 2 years to demonstrate compliance with the emission limits in the rule. As an alternative to the source test, units that are fired on natural gas and existing units that were eligible for the low-use fuel exemption are allowed to have the operator perform a unit tune-up two times per year in lieu of the required source test. These testing requirements will remain unchanged in the revised rule.

However, the District Tune-Up Procedures are being updated to reflect the revised emissions limits and to reference the South Coast Air Quality Management District (SCAQMD) Combustion Gas Periodic Monitoring Protocol (May 1, 2009). The District has found that the SCAQMD protocol is more commonly used by boiler technicians to calibrate and maintain their NOx analyzers, as opposed to the procedure used by the American Society for Testing and Materials (ASTM).

### 3.6 AB 617 – Rule 361 BARCT Amendments

Rule 361, as adopted in 2008, requires all existing units (those units installed before 2008) to meet the 30 ppm NOx emission standard by January 1, 2020. Even though lower-emitting units have become readily available and cost-effective over the course of the last decade, the District's 2016 Ozone Plan stated that the Rule 361 amendments would be focused only on new and modified boilers. However, due to the AB 617 BARCT requirements, the District evaluated the possibility of requiring the existing units at the AB 617 industrial sources to meet the lower emission standards at an earlier date.

Rule 361 – BARCT Analysis

Based on the District's review of this source category, the proposed emission limits of 9-12 ppm NOx in Rule 361 represent the current BARCT determination for Santa Barbara County. Under the proposed amendments, most gaseous-fired units will have to comply with the BARCT emission standard of 9-12 ppm when they are modified on or after January 1, 2020.

AB 617 also requires implementation of the BARCT emission standard at the AB 617 industrial sources by no later than December 31, 2023. When reviewing the applicable units, the District found that some of the units still have uncertified, conventional burners. These units are scheduled to meet the 30 ppm NOx limit by January 1, 2020, as required under 2008 version of Rule 361. The District acknowledges that it would not be cost-effective to replace or modify these boilers to 30 ppm NOx in 2020, and then replace them again in 2023 to meet the BARCT standard.

The District evaluated the facilities and concluded that it would be feasible to have these uncertified units meet the BARCT standard no later than one year after the rule amendments are approved by the District Board of Directors. This change effectively delays the existing January 1, 2020 compliance date, but it makes up for the delayed emission benefit by requiring the ultra-low NOx standard sooner than December 31, 2023. A one-year timeline will give the facilities time to scope out and install new equipment that can meet the BARCT standard. This requirement would affect boilers at the following two facilities:

- ERG Operating Company – Cat Canyon West, and
- Imerys Minerals California.

This determination meets the AB 617 mandate by achieving emission reductions at the largest industrial sources in the County, and all of the BARCT requirements for AB 617 are satisfied for this source category.

# 4. PROPOSED RULE AMENDMENTS – Rule 342

## 4.1 Overview of Proposed Amendments

The District is proposing the following major amendments to Rule 342:

- Lowering the NOx emission limits for newly installed or modified gaseous-fired units from 30 ppm down to 7-25 ppm, depending on the fuel being burned;
- Adding in startup and shutdown provisions; and
- Incorporating BARCT requirements for the AB 617 industrial sources.

All of the amendments are described in further detail in their corresponding sections below.

## 4.2 Rule Title

When Rule 342 was initially adopted in 1992, it was named "Control of Oxides of Nitrogen (NOx) From Boilers, Steam Generators, and Process Heaters." This name, by itself, informs the reader that if you have a boiler or steam generator, you should read the rule to learn if there are any applicable requirements to your equipment unit. Yet the naming becomes more convoluted when comparing it to other District-adopted boiler rules.

Hence, the District is in the process of implementing a new naming convention to minimize the confusion between the various boiler rules. Proposed Rule 342 will be named "Boilers, Steam Generators, and Process Heaters (5 MMBtu/hr and greater)." This title creates a simplified boiler rule naming convention that conveys the applicability without having to open the rule, which will help the public quickly identify the applicable rule for their equipment unit.

## 4.3 Requirements - Emission Limits

<u>Gaseous-fired units</u>

The focus of this rule amendment is to lower the emission limits for new and modified gaseous units to the more stringent 7-9 ppm NOx emission limit, beginning on January 1, 2020. For the purpose of this rule, gaseous fuels includes natural gas, field gas produced in the oilfields, propane, and any other fuel which is a gas at standard conditions.

To meet these lower standards, most boilers will have to be equipped with ultra-low NOx burners. Ultra-low NOx burners are designed to achieve low emissions while maintaining good flame stability and heat transfer characteristics. Furthermore, these burners may increase thermal efficiencies by reducing the amount of excess air needed for combustion. This has the added benefit of reducing fuel usage, which results in energy savings.

Ultra-low NOx burner systems in the 5-20 MMBtu/hr size range can achieve the 9 ppm NOx limit without the use of Flue Gas Recirculation (FGR). Larger units, those rated at 20 MMBtu/hr or more, are proposed to meet a NOx emission limit of 7 ppm. Most larger units will need FGR to consistently reach sub-7 ppm levels.

Other fuels

Not all fuel types can easily meet the ultra-low NOx standard. Units that are fired on alternative fuel types, such as boilers that are fired on digester gas at a waste water treatment plant, can't easily achieve these emission levels. This is mainly due to the fluctuations or impurities in the fuel. As such, these other fuels have different standards to reflect what is feasible with the available technologies.

The proposed NOx limit for landfill gas-fired units is 25 ppm, and the proposed NOx limit for digester gas is 15 ppm. Both of these standards are based on the NOx limits for existing equipment subject to SCAQMD Rule 1146, and these limits are also identical to the proposed limits in Rule 361.

### 4.4 Startups and Shutdowns

Unlike Rule 361, Rule 342 was not found to have a deficiency during the SIP submittal to the EPA. Nonetheless, the District has still added new definitions and requirements for startups and shutdowns in the rule to be consistent with the current EPA determinations. These changes are necessary to clearly define the startup and shutdown time frames because the emission limits of the rule do not apply during these periods. Air emissions must still be minimized during all startups and shutdowns, and the proposed provisions are consistent with the EPA policy as discussed in an EPA memorandum, dated February 15, 1983, "Policy on Excess Emissions During Startup, Shutdown, Maintenance and Malfunctions."

### 4.5 Testing & Tune-up Procedures

Rule 342, as amended in 1992, requires source testing to be performed every 2 years for most units subject to the rule. As an alternative to the source testing requirement, existing units that are eligible for the low-use fuel exemption are allowed to perform an annual unit tune-up in lieu of the required source test. Detailed District Tune-Up Procedures were included in the 1992 rule, but they only focused on forced-draft units. Most units in this size range will be forced-draft units, but there is a possibility that a natural draft unit is installed. To make sure that the rule has the appropriate references to natural draft units, the tune-up procedures are being updated.

### 4.6 AB 617 – Rule 342 BARCT Amendments

Rule 342 – BARCT Analysis

The California Air Resources Board performed a BARCT evaluation for boilers, steam generators, and process heaters back in 1991, and at that time, BARCT was determined to be a 30 ppm NOx emission standard for units that were 5 MMBtu/hr and greater. Yet technology has progressed rapidly since 1991, and a new BARCT determination is necessary for Rule 342.

Based on the District's review of this source category, the proposed emission limits of 7-9 ppm NOx in Rule 342 represent the current BARCT determination for Santa Barbara County. Under the proposed amendments, most gaseous-fired units will have to comply with the BARCT emission standard of 7-9 ppm when they are modified on or after January 1, 2020.

AB 617 also requires implementation of the BARCT standard at the AB 617 industrial sources by no later than December 31, 2023. When reviewing the applicable units, the District found that all of the units that are currently permitted at Pacific Coast Energy Company (PCEC) – Orcutt Hill and ERG – Cat Canyon West already comply with the BARCT standard. Hence, the only AB 617 facilities that would be affected by the requirements are:

- Windset Farms,
- Exxon Mobil – Pacific Offshore Pipeline Company (POPCO), and
- Imerys Minerals California.

Rule 342 – Windset Farms Analysis

Windset Farms is an agricultural source that uses six large boilers to generate both heat and carbon dioxide ($CO_2$) for its greenhouse operations. In this unique scenario, the exhaust gases from the boilers are directed into the greenhouse as a means of supplementing $CO_2$ to their crops and providing an ideal growing environment. Since these boilers are being used in an agricultural operation and the facility does not require a federal Title V permit, the boilers are currently exempt from obtaining a District Permit to Operate and from the requirements of Rule 342.

Despite being categorized as an agricultural operation pursuant to District rules, Windset Farms is an industrial source that is subject to the California Air Resources Board's Cap-and-Trade Program; therefore, the AB 617 BARCT requirements apply to the facility. The District performed an evaluation of the boilers at Windset Farms and asked multiple vendors for data regarding the feasibility of retrofitting such agricultural boilers to the ultra-low NOx standard. Based on the District's research, the current ultra-low NOx burners cannot meet the specific parameters required for Windset Farms' $CO_2$ dosing process. This is because the boilers need to maintain a near-zero level of carbon monoxide in the exhaust, and the ultra-low NOx technologies increase the carbon monoxide concentrations above this near-zero level. Windset Farms also completed a similar retrofit analysis which can be found in Attachment B to this staff report.

Accordingly, the District proposes to establish a new BARCT emission standard for the $CO_2$ dosing process based on what is feasible for these types of units. The BARCT standard is proposed to be 30 ppm NOx and 10 ppm carbon monoxide (CO). The boilers at Windset Farms currently meet these emission standards. Therefore, no equipment modifications will be needed for their boilers to meet these proposed new emission limits.

To make the BARCT emission standard enforceable, the District proposes to amend the Rule 342.B.1.d exemption so that the boilers at Windset Farms have to comply with Rule 342.[1] New language is also included in the rule that outlines the requirements for a Compliance Plan. The Compliance Plan is a mechanism to verify that the boilers adhere to the BARCT requirements. The Compliance Plan would need to be submitted to the District by January 30, 2023, and it would remain in effect for the life of the units. Furthermore, if any additional boilers are installed at Windset Farms, the Compliance Plan would need to be updated at least 90 days prior to the proposed boiler installation.

[1] All other agricultural boilers at smaller greenhouses would still remain exempt from the rule requirements.

Rule 342 – POPCO and Imerys Analysis

Based on cost estimates presented in Section 6.2, it is cost-effective to retrofit the main boiler at the Imerys facility with an ultra-low NOx burner. The current actual heat input rates for the back-up boiler at the Imerys facility and the two off-line boilers at the POPCO facility are less than 9,000 MMBtu per year. The District proposes to create a low-use exemption for AB 617 industrial sources using a 9,000 MMBtu per year threshold. Below this threshold, it is not cost-effective to retrofit these three units based on their current actual fuel use. Notwithstanding this exemption, Section D.3 would require ultra-low NOx burners if these units are ever replaced or modified. Further, Section D.4 requires the units to meet the ultra-low NOx standard if their operations surpass the low-use threshold by the timeline specified in Section K.4.

# 5. COMPARISON WITH OTHER AIR DISTRICTS

The District compared Rule 361 and Rule 342 to the following rules in other air districts:

**Rule 361**

- South Coast Air Quality Management District Rule 1146.1 (Emissions of Oxides of Nitrogen From Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)
- Ventura County Air Pollution Control District Rule 74.15.1 (Boilers, Steam Generators, and Process Heaters)
- San Joaquin Valley Air Pollution Control District Rule 4307 (Boilers, Steam Generators, and Process Heaters - 2.0 MMBtu/hr to 5.0 MMBtu/hr)
- Bay Area Air Quality Management District Regulation 9, Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters)
- Sacramento Metropolitan Air Quality Management District Rule 411 (NOx from Boilers, Process Heaters And Steam Generators)

**Rule 342**

- South Coast Air Quality Management District Rule 1146 (Emissions of Oxides of Nitrogen From Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters)
- San Joaquin Valley Air Pollution Control District Rule 4320 (Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater Than 5.0 MMBtu/hr)
- Bay Area Air Quality Management District Regulation 9, Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters)
- Sacramento Metropolitan Air Quality Management District Rule 411 (NOx from Boilers, Process Heaters And Steam Generators)

A comparison of the District's proposed rules to the rules adopted by other nearby air districts is shown below in Tables 5.1 and 5.2. Based on the District's analysis, the proposed rules are not requiring any provisions that are more stringent than what has already been adopted in the other air districts. Furthermore, the rules are written in such a way that they are as consistent as possible with other air districts while still adequately acknowledging the specific needs of the region covered by the Santa Barbara County Air Pollution Control District.

**Table 5.1. Comparison of Nearby Air District Rules – Rule 361**

| RULE DESCRIPTION / DISTRICT | | SANTA BARBARA APCD Rule 361 (Proposed) | SOUTH COAST AQMD Rule 1146.1 (2008) | VENTURA APCD Rule 74-15-1 (2015) | SAN JOAQUIN VALLEY APCD Rule 4307 (2008) |
|---|---|---|---|---|---|
| **Section** | **Rule Component** | | | | |
| **Applicability** | MMBtu/hr rating | 2 – 5 | 2 – 5 | 1 – 5 | 2 – 5 |
| | Fuel Type | Gas/Liquid/Solid Fuels | Gas/Liquid/Solid Fuels | Gaseous & Liquid | Gaseous & Liquid |
| | Type of Rule | Point of Installation | 3-6 year phase out | Point of Installation | Point of Installation |
| | When are the new limits effective? | 2020 | 2012 - 2015 | 2016 | 2010 - 2016 |
| **Exemptions** | Emergency Use | Yes – 168 hours | --- | Yes | Yes – 168 hours |
| | Startups & Shutdowns | Yes | Yes | --- | Yes |
| **Emission Limits** | NG – non-atmospheric | 9 ppm NOx | 9 ppm NOx | 9 ppm NOx | 9 ppm NOx |
| | NG –atmospheric | 12 ppm NOx | 12 ppm NOx | 12 ppm NOx | 12 ppm NOx |
| | FG – non-atmospheric | 9 ppm NOx | --- | 12 ppm NOx | 9 ppm NOx |
| | FG –atmospheric | 12 ppm NOx | --- | 15 ppm NOx | 12 ppm NOx |
| | Landfill Gas | 25 ppm NOx | 25 ppm NOx | 25 ppm NOx | --- |
| | Digester Gas | 15 ppm NOx | 15 ppm NOx | 15 ppm NOx | --- |
| | LPG/Propane | 20 ppm NOx | --- | 20 ppm NOx | --- |
| **Testing** | Source Test | *Natural Gas:* none<br>*All others:* every 2 years | Every 5 years | Every 4 years | When installed or modified, if not certified |
| | Tune-up | *Natural Gas:* Semiannual<br>*All others:* none | Semiannual | *Low-use:* Semiannual | Semiannual |
| | NOx Analyzer | During Tune-ups | Quarterly/Semiannually | Every year a source test is not performed | May be performed in lieu of tune-up |
| **Recordkeeping** | Record Duration | 5 years | 2 years | 4 years | 5 years |

**Table 5.2. Comparison of Nearby Air District Rules – Rule 342**

| RULE DESCRIPTION / DISTRICT | | SANTA BARBARA APCD Rule 342 (Proposed) | SOUTH COAST AQMD Rule 1146 (2008)* | SACRAMENTO METROPOLITAN Rule 411 (2007) | SAN JOAQUIN VALLEY APCD Rule 4320 (2008) |
|---|---|---|---|---|---|
| **Section** | **Rule Component** | | | | |
| **Applicability** | MMBtu/hr rating | 5+ | 5+ | 5+ | 5+ |
| | Fuel Type | Gas/Liquid/Solid Fuels | Gas/Liquid/Solid Fuels | Gas/Liquid/Solid Fuels | Gaseous & Liquid |
| | Type of Rule | Point of Installation | 3-6 year phase out | 2-4 year phase out | 2-5 year phase out |
| | When are the new limits effective? | 2020 | 2012 - 2015 | 2007 - 2009 | 2010 - 2014 |
| **Exemptions** | Emergency Use | Yes – 168 hours | --- | Yes – 168 hours | Yes – 168 hours |
| | Startups & Shutdowns | Yes | Yes | Yes | Yes |
| **Emission Limits** | Gaseous (NG/FG/LPG): 5-20 MMBtu/hr | 9 ppm NOx | *Atmospheric:* 12 ppm<br>*5-20 MMBtu/hr:* 9 ppm | 15 ppm NOx | 9 ppm NOx (standard schedule) |
| | Gaseous (NG/FG/LPG): 20+ MMBtu/hr | 7 ppm NOx | *20-75 MMBtu/hr:* 9 ppm<br>*75+ MMBtu/hr:* 5 ppm | 9 ppm NOx | 7 ppm NOx (standard schedule) |
| | Landfill Gas | 25 ppm NOx | 25 ppm NOx | 15 ppm NOx | --- |
| | Digester Gas | 15 ppm NOx | 15 ppm NOx | --- | 9 ppm NOx |
| | Nongaseous | 40 ppm NOx | 40 ppm NOx | 40 ppm NOx | 40 ppm NOx |
| **Testing** | Source Test | Every 2 years | *<10 MMBtu/hr:* 5 years<br>*20+ MMBtu/hr:* 3 years | *5-20 MMBtu/hr:* 2 years<br>*20+ MMBtu/hr:* Annual | Every 1 -3 years |
| | Tune-up | *Low-use:* Annual | Semiannual | *Low-use:* Annual | Semiannual |
| | NOx analyzer test | --- | Semiannual | --- | Monthly operating parameter check |
| **Recordkeeping** | Record Duration | 5 years | 2 years | 5 years | 5 years |

* SCAQMD has recently published proposed revisions to Rule 1146 that further lower the emission limits for certain categories of boilers.

# 6. IMPACTS OF THE PROPOSED RULE

## 6.1 Emission Impacts

To identify the emission impacts of the rule, the District first needed to identify the applicable units that may get emission reductions under the proposed amendments. The majority of the emission reductions come from natural gas or field gas-fired units, as the District only has a couple of small digester gas-fired and propane-fired units permitted in the County. Accordingly, staff queried the District's permit database to evaluate how many existing units already have ultra-low NOx burners that meet the proposed standards and how many units may need to meet the lower NOx limits when they are replaced or modified.

For this evaluation, the District also excluded applicable units that have continuously been operated as "Low-Use" units. Low-Use units are limited by their permit conditions to combust less than 1,800 MMBtu for Rule 361 existing units and less than 9,000 MMBtu per year for Rule 342 units. These units are not anticipated to be replaced soon due to their minimal usage which extends their operating life. The results of the District's permit database query are shown in Table 6-1 below.

**Table 6-1: Number of Units in the District based on Permit Database**

| MMBtu/hr Range | # Ultra-Low NOx Units | # Higher Emitting Units | # Low-Use Units | Total Units |
|---|---|---|---|---|
| 2 – 5 | 6 | 122 | 24 | 152 |
| 5 – 20 | 12 | 19 | 8 | 39 |
| 20+ | 13 | 8 | 2 | 23 |
| | | | **Total Units:** | **214** |

An operating capacity factor of 0.25 was chosen as a conservative estimate to help quantify the emission reductions from the higher-emitting boilers. Even though all of these units require a permit from the District, the majority of the units in the 2-5 MMBtu/hr range do not have a totalizing fuel flow meter, and so assumptions have to be made about their operating capacity. It's important to note that operating capacities of individual units will vary from year-to-year based on the production needs of the facility. Using these assumptions, the estimated emission reductions for each size range are shown in Table 6-2, below.

**Table 6-2: Estimated Emission Reductions from Rule 361 and Rule 342 Units**

| MMBtu/hr Range | # Higher Emitting Units | Δ Emission Factor (lb/MMBtu) | Operating Capacity Factor | hours/ year | lbs/ton | NOx emission reductions [1] (tpy) |
|---|---|---|---|---|---|---|
| 2 – 5 | 122 | (0.036 - 0.013) [2] | 0.25 | 8,760 | 2,000 | 7.7 |
| 5 – 20 | 19 | (0.036 - 0.011) [3] | 0.25 | 8,760 | 2,000 | 3.6 |
| 20+ | 8 | (0.036 - 0.009) [4] | 0.25 | 8,760 | 2,000 | 5.0 |
| | | | | | **Total TPY:** | **16.3** |

The anticipated emission reductions from these rule amendments is calculated to be 16.3 tons of NOx per year after the rule is fully implemented and all of the older units, excluding low-use units, are replaced. Since this is (with the exception of the AB 617 industrial sources) a point-of-installation and modification rule, the NOx emission reductions from the proposed rule amendments will occur gradually as units are replaced with newer, ultra-low NOx units. For these types of units, the average life expectancy is anticipated to be 15 years. Some units may need to be replaced sooner, and others could last up to 30 years if maintained properly. Overall, it is reasonable to assume that over the course of the next 15 years, all existing heating equipment subject to this rule will be replaced in a linear fashion, with about 6.7% of the boiler inventory replaced each year.

### 6.2 Cost-Effectiveness

California Health and Safety Code section 40703 requires the District, in the process of adopting or amending a rule, to consider and make public its findings related to the cost-effectiveness of a control measure. Cost-effectiveness, for rule-making purposes, is calculated by taking the estimated compliance costs of the rule and dividing it by the amount of air pollution reduced.

Estimated compliance costs for a rule can include, but are not limited to, capital equipment costs, engineering design costs, installation costs, and on-going maintenance costs, such as additional labor, fuel, or electrical costs. Because the rule is not (with the exception of the AB 617 industrial sources) forcing additional or early replacement of units, the primary costs that are expected to vary for compliant units is the capital cost of the equipment and any increased operational costs for using additional blowers or flue gas recirculation. Of note, there may be fuel savings associated with the installation of newer, more efficient units, but to be conservative, these cost-effectiveness calculations will not reflect any such fuel savings.

District staff asked various manufacturers for the price differences between units at the proposed standards and units at the current standards to come up with the estimated incremental capital and operational costs. Staff also reviewed the costs published by other Air Districts in their staff reports and incorporated the costs as appropriate. The anticipated costs for Santa Barbara County are shown below in Table 6-3.

[1] tpy = ∑ [(Unit Rating) * (Δ Emission Factor) * (Operating Capacity Factor) * (hrs/year) / (lbs/ton)],
Where: Δ Emission Factor = 30 ppm - Amended Rule Emission Factor

[2] Amended Rule Emission Factor represents an average of the 9 and 12 ppm NOx limits.

[3] Amended Rule Emission Factor represents the 9 ppm NOx limit.

[4] Amended Rule Emission Factor represents the 7 ppm NOx limit.

**Table 6-3: Estimated Incremental Costs per Unit**

| **Unit Rating** (MMBtu/hr) | **Incremental Equipment Cost** ($/installation) | **Incremental Operational Costs** ($/yr) |
|---|---|---|
| 2 | $6,900 | $390 |
| 5 | $9,300 | $1,000 |
| 10 | $34,200 | $2,000 |
| 15 | $35,000 | $3,000 |
| 20 | $38,500 | $5,000 |
| 25 | $60,000 | $6,000 |
| 50 | $60,000 | $12,000 |

For cost-effectiveness calculations, the District uses the Levelized Cash Flow (LCF) method. In the LCF method, a capital recovery factor (CRF) is used to transform any capital costs into an equivalent annual cost. The CRF is necessary because the one-time capital expenditures reduce emissions over the entire duration of the project life. Hence, the CRF is a function of the real interest rate and equipment life. The annualized costs for various sizes of boilers are shown in Table 6-4, below:

**Table 6-4: Estimated Annualized Costs per Unit**

| **Unit Rating** (MMBtu/hr) | **Incremental Capital Costs** ($/installation) | **CRF** | **Incremental Operational Costs** ($/yr) | **Annualized Cost** ($/yr) |
|---|---|---|---|---|
| 2 | $6,900 | 0.103 | $390 | $1,100 |
| 5 | $9,300 | 0.103 | $1,000 | $1,940 |
| 10 | $34,200 | 0.103 | $2,000 | $5,520 |
| 15 | $35,000 | 0.103 | $3,000 | $6,580 |
| 20 | $38,500 | 0.103 | $5,000 | $8,960 |
| 25 | $60,000 | 0.103 | $6,000 | $12,180 |
| 50 | $60,000 | 0.103 | $12,000 | $18,180 |

Where:

Annualized Cost = (Incremental Capital Costs * CRF) + (Incremental Operational Costs)

$$CRF = \frac{i * (1 + i)^n}{(1 + i)^n - 1} = \frac{0.06 * (1 + 0.06)^{15}}{(1 + 0.06)^{15} - 1} = 0.103$$

i = Real Interest Rate (6%)
n = Equipment Life (15 years)

The total estimated emission reductions calculated for all of the units in these size categories was previously shown as 16.3 tons per year of NOx. The cost-effectiveness calculations, however, depend on the emission reductions from a single unit. The emission reductions per individual unit are determined using similar assumptions and methodology as used in Section 6.1, Emission Impacts.

**Table 6-5: Estimated Emissions Reductions per Unit**

| **Unit Rating** (MMBtu/hr) | **Δ Emission Factor** (lb/MMBtu) | **Operating Capacity Factor** | **hrs/year** | **lbs/ton** | **NOx emission reductions** (tpy) |
|---|---|---|---|---|---|
| 2 | (0.036 – 0.013) | 0.25 | 8,760 | 2,000 | 0.05 |
| 5 | (0.036 – 0.013) | 0.25 | 8,760 | 2,000 | 0.13 |
| 10 | (0.036 – 0.011) | 0.25 | 8,760 | 2,000 | 0.28 |
| 15 | (0.036 – 0.011) | 0.25 | 8,760 | 2,000 | 0.42 |
| 20 | (0.036 – 0.011) | 0.25 | 8,760 | 2,000 | 0.56 |
| 25 | (0.036 – 0.009) | 0.25 | 8,760 | 2,000 | 0.77 |
| 50 | (0.036 – 0.009) | 0.25 | 8,760 | 2,000 | 1.54 |

For calculating the final cost-effectiveness in dollars-per-ton, the annualized cost of a unit is divided by one year's worth of the estimated emission reductions for the unit. The final cost-effectiveness values for each unit type are as follows:

**Table 6-6: Cost-Effectiveness per Unit**

| **Unit Rating** (MMBtu/hr) | **Annualized Cost** ($/yr) | **NOx Reductions** (tpy) | **Cost-Effectiveness** ($/ton) |
|---|---|---|---|
| 2 | $1,100 | 0.05 | $20,800 |
| 5 | $1,940 | 0.13 | $14,600 |
| 10 | $5,520 | 0.28 | $19,700 |
| 15 | $6,580 | 0.42 | $15,700 |
| 20 | $8,960 | 0.56 | $16,000 |
| 25 | $12,180 | 0.77 | $15,900 |
| 50 | $18,180 | 1.54 | $11,900 |

These cost-effectiveness values are conservative estimates that are intended to reflect the typical values for a boiler project. Even so, the cost-effectiveness of the rules are within the acceptable range of previously adopted boiler prohibitory rules, and so Rules 361 and 342 are considered to be cost-effective.

### 6.3 Incremental Cost-Effectiveness

California Health and Safety Code section 40920.6 requires the performance of an incremental cost-effectiveness analysis that identifies more than one control option that meets the emission reduction objective of the regulation. The incremental cost-effectiveness is the difference in cost between two successively more effective controls, divided by the additional emission reductions achieved.

When comparing alternative technologies available for achieving NOx reductions for boilers, the most cost-effective means is implementing ultra-low NOx burners. The District considered requiring a 5 ppm NOx limit for the largest boilers in the District. Attaining this 5 ppm emission limit typically requires the use of selective catalytic reduction (SCR), which involves injecting aqueous ammonia into the exhaust stream. The ammonia reacts with the flue gas over a catalyst to reduce the NOx into nitrogen gas, water vapor, and carbon dioxide. These systems are quite expensive to install and maintain, with preliminary cost estimates exceeding $50,000/ton of NOx reduced. Accordingly, such a requirement would not be cost-effective for Santa Barbara County.

### 6.4 Socioeconomic Impacts

California Health and Safety Code section 40728.5 requires Districts with populations greater than 500,000 people to consider the socioeconomic impact of any new rule if air quality or emission limits are significantly affected. In 2016, the population of Santa Barbara County was approximately 445,000 persons based on data from the Santa Barbara County Association of Governments. Using the expected growth rates for the County, the current population estimate is still below the 500,000 person threshold. Therefore, the District is not required to perform a socioeconomic impact analysis for the proposed rule amendment.

### 6.5 Impact to Industry

The proposed amendments to Rules 361 and 342 will affect boiler, steam generator, and process heater owners and operators within the County. Since the units affected by the proposed amendments are found throughout the commercial, institutional, and industrial sectors, a wide range of businesses may be affected.

The rule amendments will have a fiscal impact on purchasers of new boilers, steam generators, and process heaters. Except for the special cases of the AB 617 industrial source units, the rules do not require businesses to replace their equipment. Instead, when the operators choose to replace the equipment or the equipment has reached the end of its useful life, the operators must purchase the ultra-low NOx units. New equipment meeting the ultra-low NOx standard cost approximately 15-25% more than the equipment that meets the 30 ppm standard. These costs were documented in Section 6.2, above. The District has seen that these ultra-low NOx units are both feasible to install and are cost-effective. Hence, staff concludes that meeting the proposed limits will not significantly impact industry.

### 6.6 Impact to the District

The proposed amendments are not expected to result in any significant increased workload for District staff since the proposed amended rules will mainly incorporate new requirements for newly-installed and modified units, which already require a permit from the District. For those units that are on existing compliance schedules, the District will reach out to industry to remind them of any upcoming requirements.

# 7. ENVIRONMENTAL IMPACTS – CEQA

## 7.1 Environmental Impacts

California Public Resources Code section 21159 requires the District to perform an analysis of the reasonably foreseeable environmental impacts of the methods of compliance. The analysis shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites.

The analysis must include the following information on the proposed rule:

*1) An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.*

The amendments to Rules 361 and 342 will affect newly installed and modified units. The newer ultra-low NOx units will replace higher-emitting units over time. Since ultra-low NOx units are expected to have the same useful/operational life as standard units, no additional waste is expected to appear in landfills. In addition, old boilers are frequently recycled. The new ultra-low NOx units are expected to cause no adverse environmental impacts.

*2) An analysis of the reasonably foreseeable mitigation measures.*

Since no adverse environmental impacts are expected, no mitigation measures are proposed.

*3) An analysis of the reasonably foreseeable alternative means of compliance with the rule or regulation.*

No alternatives means of compliance are proposed. The emission standards that are proposed have been in place in other Air Districts for the last 5 years, and there are a number of manufacturers that can supply equipment that complies with the proposed rules. Manufacturers are expected to continue to develop compliant equipment, increasing competition and decreasing costs. The above analysis under Public Resource Code section 21159 further demonstrates that there is no reasonable possibility that the amendment of proposed Rule 361 or Rule 342 will have a significant effect on the environment due to unusual circumstances.

## 7.2 California Environmental Quality Act (CEQA) Requirements

The District prepared a program Environmental Impact Report (EIR) for the 2010 Clean Air Plan that evaluated the potential environmental impacts related to the implementation of several control measures aimed at reducing emissions of both ROC and NOx. The 2010 Clean Air Plan EIR included an analysis of potential impacts related to amendments to Rules 361 and 342.

Staff evaluated the difference between the control measure description that was evaluated in the 2010 Clean Air Plan EIR and the proposed amendments to Rules 361 and 342, to assess whether the difference would result in new significant environmental impacts. The District found that there were minor technical changes in the proposed amendments that were not examined in the

EIR, but none of the conditions described in State CEQA Guidelines section 15162 or 15163, calling for the preparation of a subsequent EIR or supplement to an EIR, are anticipated to result from these differences. Therefore, pursuant to section 15164 of the State CEQA Guidelines, the District prepared an Addendum to the 2010 Clean Air Plan EIR which will be considered at the time of Board adoption.

## 8. PUBLIC REVIEW

AB 617 BARCT Rule Development Schedule

As discussed in Section 2.5 of this report and as required by AB 617, the District Board adopted a rule development schedule to implement BARCT requirements at sources subject to the California Cap-and-Trade program (AB 617 industrial sources). As part of the BARCT rule development schedule process, the District issued notices to all affected sources in October, 2018 and invited them to attend a joint public workshop and Community Advisory Council meeting on November 7, 2018. Representatives from all of the AB 617 industrial sources affected by the BARCT rule development schedule attended the November 7, 2018 workshop.

Rules 361 and 342 Workshops

The District held a public workshop to present, discuss, and hear comments on the draft rules on March 14, 2019 at the Solvang City Council Chambers. To inform the public about the workshop, District staff emailed a public notice to everyone who subscribed to the noticing subscription list. Staff also mailed a hardcopy notice to the 72 companies that may be affected by the rule revisions, and shared information about the workshop on the District's social media. The workshop was attended by representatives from seven different entities, which includes Vandenberg Air Force Base, HVI Cat Canyon, ERG Resources, Exxon Mobil, Windset Farms, the City of Santa Maria, and the County of Santa Barbara.

The draft rules were made available on the District's website and a two week comment period followed the workshop. Verbal comments received during the workshop and written comments received during the comment period were considered and incorporated into the proposed amendments to Rules 361 and 342, as appropriate. The public comments that were received in response to the workshop are included as Attachment B to this report.

Community Advisory Council

To facilitate the participation of the public and the regulated community in the development of the District's regulatory program, the District created the Community Advisory Council (CAC). The CAC is composed of representatives appointed by the District's Board of Directors. Its charter is, among other things, to review proposed changes to the District's Rules and Regulations and make recommendations to the Board of Directors on these changes.

The CAC convened and discussed the amendments to District Rules 361 and 342 on May 1, 2019 at the Solvang Veteran's Memorial Building. At the meeting, staff presented the key aspects of both the rules and the staff report to the CAC members. The CAC then deliberated the various aspects of the rules, such as the proposed emission limits, the available control

technologies, and the requirements for the AB 617 BARCT industrial sources. After the discussions, the CAC unanimously recommended that the District Board adopt the amendments to Rules 361 and 342, as proposed.

Public Hearing

In accordance with California Health and Safety Code section 40725, the proposed amendments were publicly noticed and made available at the District offices and on the District's website prior to the public hearing before the Board of Directors. The public was invited to the hearing and can provide comments on the proposed amendments prior to or at the hearing.

# 9. REFERENCES


1) South Coast Air Quality Management District – Rule 1146.2 (Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters), Amended November 1, 2013.
2) South Coast Air Quality Management District – *Staff Report for Proposed Amended Rule 1146 (Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters),* August 2008.
3) South Coast Air Quality Management District – Rule 1146.1 (Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters), Amended November 1, 2013.
4) South Coast Air Quality Management District – *Staff Report for Proposed Amended Rule 1146.1 (Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters),* August 2008.
5) San Joaquin Valley Unified Air Pollution Control District – Rule 4307 (Boilers, Steam Generators, and Process Heaters - 2.0 MMBtu/hr to 5.0 MMBtu/hr), Amended October 16, 2008.
6) San Joaquin Valley Unified Air Pollution Control District – Rule 4320 (Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater Than 5.0 MMBtu/hr), Adopted October 16, 2008.
7) San Joaquin Valley Unified Air Pollution Control District – *Staff Report for Rule 4306, 4307, and 4320,* October 16, 2008.
8) Sacramento Metropolitan Air Quality Management District – Rule 411 (NOx from Boilers, Process Heaters And Steam Generators), Amended August 23, 2007.
9) Sacramento Metropolitan Air Quality Management District – *Staff Report for Rule 411 (NOx from Boilers, Process Heaters And Steam Generators),* August 8, 2007.
10) Bay Area Air Quality Management District – Regulation 9, Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters), Amended May 4, 2011.
11) Bay Area Air Quality Management District – *Staff Report for Regulation 9, Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters),* June 2008.
12) Ventura County Air Pollution Control District –Rule 74.15.1 (Boilers, Steam Generators, and Process Heaters), Amended June 23, 2015.
13) Ventura County Air Pollution Control District – *Staff Report for Rule 74.15.1 (Boilers, Steam Generators, and Process Heaters),* June 23, 2015
14) California Air Resources Board – *Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters,* July 18, 1991.


# 10. ATTACHMENTS

**10.1 Attachment A. FAQs and Rule Clarification**
**10.2 Attachment B. Public Comments**
**10.3 Attachment C. Response to Public Comments**

# ATTACHMENT A

# FAQs and Rule Clarification

# Attachment A: FAQs and Rule Clarification

The following text provides rule clarifications in the format of frequently asked questions:

1. **Question:** I have an existing Rule 361 boiler that was installed in 2005, and I have to retrofit the boiler to meet the 30 ppm NOx requirement by January 1, 2020, in accordance with the 2008 version of Rule 361. Under these proposed amendments, will I have to change my plans and have the boiler meet the lower 9-12 ppm NOx limits?

   **Response:** No. All existing boilers will only have to meet the 30 ppm NOx limits. The ultra-low NOx limits for new or modified units begin on or after January 1, 2020.

2. **Question:** My company plans to install a new boiler in the year 2022. Can the newly-installed unit qualify for the low-use exemption at the time of installation?

   **Response:** No. Under both Rule 342 and Rule 361, the low-use exemption is only for existing units.

3. **Question:** According to the proposed rules, does my boiler need to meet the ultra-low NOx standards if I replace my existing burner with a new burner?

   **Response:** Yes, the Rule 361 and Rule 342 definitions for "modification" include all burner replacements.

4. **Question:** Are these rules applicable to a Heat Recovery Steam Generator associated with a gas turbine cogeneration system?

   **Response:** No. Rule 342 and Rule 361 do not apply to a fired or unfired waste heat recovery boiler associated with a gas turbine cogeneration system. Waste heat recovery boilers include Heat Recovery Steam Generators. BARCT requirements for this type of unit will be addressed under a turbine rule because the unit is designed to work in conjunction with a turbine, and shares a common exhaust stack with the turbine.

5. **Question:** What reference should be used when reporting NOx emissions?

   **Response:** The District requires NOx to be reported as $NO_2$.

# ATTACHMENT B

Public Comments

March 28, 2019

Mr. Timothy Mitro
Santa Barbara County
Air Pollution Control District
260 North San Antonio Rd., Suite A
Santa Barbara, CA 93110

Submitted via email: MitroT@sbcapcd.org

Subject: Comments on Rule 342 - Boilers 5MMBtu/hr and greater

Dear Mr. Mitro:

On behalf of Windset Farms, I am submitting these comments to explain our challenges with complying with the requirements set forth in Rule 342, which apply to the natural gas boilers operated at our greenhouse facility located at 1650 Black Road in Santa Maria, California.

Rule 342 requires Windset Farms to replace the burners in the six boilers we operate to reduce NOx emissions to 7 ppm at 3% Oxygen. Our current NOx emission limit is 30 ppm at 3% Oxygen, and near-zero carbon monoxide, and we have complied with this limit since boiler operations began in 2012.

During a site visit to our facility on February 28, 2019, I was able to demonstrate to yourself, David Harris, and William Sarraf how Windset Farms operates the boilers in a unique way that is different than any other facility in the county. Our boilers and burners are specifically designed for horticultural use to generate heat and $CO_2$ with near-zero carbon monoxide to provide plant fertilizer and an ideal growing environment for the vegetables we produce. At other facilities the boiler exhaust is a waste stream. At our facility it is a valuable ingredient of our growing recipe and the boiler exhaust is directed into the greenhouses via ducting to allow the plants to absorb the $CO_2$.

Based on the research we have done to explore our options for replacing the boiler burners to comply with Rule 342, our findings indicate there are no available burner replacements at this time that would allow us to continue operating our boilers to match the combination of outputs we are currently receiving, abundant heat and $CO_2$ , with near-zero carbon monoxide. We have contacted several boiler and burner suppliers and manufacturers, and even though there may be an available replacement burner that reduces NOx emissions to 7 ppm, the resulting carbon monoxide emissions rise to concentrations that endanger our greenhouse workers and plants, and they do not produce the $CO_2$ we require for the plants.

In your letter dated March 5, 2019 (Appendix A), you requested additional information related to our boiler operations for a technical evaluation. The requested input is provided below:

*APCD 1: Does Windset Farms continuously monitor the CO concentration in the boiler exhaust or the ambient levels in the greenhouses?*

WF 1: Yes, the CO concentration of the exhaust is continuously monitored by a system manufactured by Zantingh, which also manufactures our burners. The system is installed on the exhaust-side of the boiler and the alarm setpoint is 18 ppm CO. When the monitoring system detects 18 ppm CO it shifts the exhaust valve to direct the flue gas to the outdoors and initiates a boiler shut-down that takes place over several minutes to prevent damaging any equipment.

*APCD 2: Does Windset Farms have a written protocol to shut off the boilers if the CO levels are too high? If yes, at what CO level does this occur.*

WF 2: We do not have a written protocol as the boiler system already has a monitoring system in place.

*APCD 3: Are any of the boilers equipped with an oxygen trim system (or similar) and/or a variable frequency drive?*

WF 3: Yes, all boilers are equipped with variable frequency drive motors to supply air to burners.

*APCD 4: Please provide a written technical evaluation/assessment on the feasibility of retrofitting the six large boilers at Windset Farms to 7 ppm NOx.*

*APCD 4a-c: The technical evaluation/assessment should include manufacturer costs and discussions on ultra-low NOx burners, flue gas recirculation, oxygen trim systems, and variable frequency drives.*

*APCD 4b: The technical evaluation/assessment should also document the expected increase in CO emissions from using the various technologies.*

*APCD 4c: The technical evaluation/assessment should use verified information from multiple manufacturers. Please include technologies such as fiber mesh burners, ceramic burners, and new ultra-low NOx burner designs.*

WF 4a-c: The following suppliers/manufacturers were contacted to evaluate potential burner retrofit options. Below is a summary of the conversations and technical information they provided.

California Boiler: Representatives of California Boiler indicate there are no available burner options at this time that can deliver the $CO_2$ we require without increased CO concentrations. Email communication included as Appendix B.

Vitotherm: A representative of Vitotherm stated they do not have burners that can meet these emission requirements. Additionally, they recommended not to use $CO_2$ from burners that have lower NOx emissions. Email communication included as Appendix C.

Zantingh: (Manufacturer of existing burners) Letter states they do not have retrofit available to comply with these emissions requirements that would allow us to provide the $CO_2$ required for plants without increasing CO to unsafe concentrations. Letter included as Appendix D.

Thermeta: A representative of Thermeta states they can supply a burner that achieves CO emissions below 5 ppm, however, they were unable to provide specifics on $CO_2$ generation and NOx. Email communication included as Appendix E.

*APCD 5: If your technical evaluation/assessment shows that 7 ppm NOx is not feasible, what is the lowest NOx level that is feasible?*

WF 5: This is difficult to determine because our research indicates that none of the available options we have reviewed would provide the outputs of heat and $CO_2$ that our operation requires.

Based on the information provided above, Windset Farms has demonstrated it is not feasible at this time to retrofit burners to comply with Rule 342 requirements and continue to operate the boilers to produce the $CO_2$ needed for successful vegetable production without increasing CO concentrations to harmful levels inside the greenhouses. Windset Farms respectfully requests an exemption to Rule 342 for natural gas boilers with capacities of 5MMBtu/hr and greater operated at horticultural greenhouse facilities in Santa Barbara County, until such time that the burner manufacturers provide a solution to comply with your requirements, and also provide the outputs required for successful greenhouse production.

If you have any questions or require additional information, please contact me at (805) 868-8117.

Sincerely,

Dillon Kass
Regulatory Compliance Manager
Windset Farms
1650 Black Road
Santa Maria, CA 93458
dkass@windset.com

Appendices:

A. Letter dated March 5, 2019 from APCD
B. Email dated March 27, 2019 from California Boiler
C. Email dated March 21, 2019 from Vitotherm
D. Letter dated March 21, 2019 from Zantingh
E. Email dated March 28, 2019 from Thermeta

APPENDIX A

Our Vision Clean Air

Santa Barbara County
Air Pollution Control District

March 5, 2019

Dillon Kass
Regulatory Compliance Manager
Windset Farms
1650 Black Road
Santa Maria, CA 93458

**Re: Follow-up to the Windset Farms Site Visit**

Dear Mr. Kass,

Thank you for taking the time to provide us a tour of the Santa Maria facility. The purpose of the site visit was to assist our evaluation of potential boiler Best Available Retrofit Control Technology (BARCT) technology requirements, as mandated by Assembly Bill 617.

The District's initial research shows that large boilers with a maximum rated heat input capacity greater than 20 million British thermal units per hour (MMBtu/hr) are capable of achieving a NOx emission rate of 7 ppm[1] and near-zero carbon monoxide (CO) emissions.

As observed during our site visit, Windset Farms operates the boilers in a different manner than most other facilities. Specifically, the boiler exhaust is vented directly into the greenhouses instead of directly to the atmosphere. You noted that near zero concentrations of CO in the greenhouses are critical to the health of the plants. This clearly differentiates Windset Farms from other facilities.

We are requesting your assistance with our technical evaluation. These are the areas that your input is needed:

1. Does Windset Farms continuously monitor the CO concentration in the boiler exhaust or the ambient levels in the greenhouses?

2. Does Windset Farms have a written protocol to shut off the boilers if the CO levels are too high? If yes, at what CO level does this occur?

3. Are any of the six boilers equipped with an oxygen trim system (or similar) and/or a variable frequency drive?

[1] Parts per million by volume, expressed on a dry gas basis and corrected to 3% oxygen content.

Aeron Arlin Genet • Air Pollution Control Officer
260 North San Antonio Road, Suite A • Santa Barbara, CA • 93110 • 805.961.8800
OurAir.org • twitter.com/OurAirSBC

4. Please provide a written technical evaluation/assessment on the feasibility of retrofitting the six large boilers at Windset Farms to 7 ppm NOx.

    a. The technical evaluation/assessment should include manufacturer costs and discussions on ultra-low NOx burners, flue gas recirculation, oxygen trim systems, and variable frequency drives.

    b. The technical evaluation/assessment should also document the expected increase in CO emissions from using the various technologies.

    c. The technical evaluation/assessment should use verified information from multiple manufacturers. Please include technologies such as fiber mesh burners, ceramic burners, and new ultra low-NOx burner designs.

5. If your technical evaluation/assessment shows that 7 ppm NOx is not feasible, what is the lowest NOx level that is feasible?

The 2018 Annual Report that was submitted by Windset Farms made a reference to a future, seventh, boiler (Boiler #6). Under the proposed amendments to District Rule 342, all newly installed equipment with a rated heat input greater than 20 MMBtu/hr will be subject to the 7 ppm NOx emission limit. Please specify the expected timeline for any future boiler installation.

Due to the rulemaking timeline we are under, we are requesting comments (including a response to this letter) on the draft amendments to Rule 342 by March 28, 2019. If you have any additional questions or concerns, please feel free to contact me at (805) 961-8883 or via email at MitroT@sbcapcd.org.

Sincerely,

Timothy Mitro

Timothy Mitro
Air Quality Engineer
Planning Division

cc: Michael Goldman

**APPENDIX B**

## Dillon Kass

**From:** Dillon Kass
**Sent:** Thursday, March 28, 2019 9:36 AM
**To:** Dillon Kass
**Subject:** FW: replacement burners - CA boiler

**From:** Roehl Fabay <rfabay@californiaboiler.com>
**Sent:** Wednesday, March 27, 2019 2:58 PM
**To:** Dillon Kass <DKass@windset.com>
**Cc:** Scott Krahn <skrahn@californiaboiler.com>
**Subject:** RE: replacement burners

Dillon - below is what we told APCD yesterday.

*"After looking into the application with CO2 dosing in the green houses I need to look at the exact boiler application. As previous discussed if they go with metal mesh technology it runs higher O2 like 7.5% to 9.5% which will drastically lower the CO2 output which cause a problem with the green house. If we use a Power Flame UCM burner with FGR the higher the required NOX the higher the amount of FGR. With that said the FGR the higher the potential of making CO. I know you want the NOX levels to drop but I think with current technology the CO can be close to near 0 with NOX requirements of 30 PPM and possibly 15 PPM NOX. We can look thru all our testing on the Ultra-low NOX burners with FGR and see what CO levels are normal at different NOX levels and get back to you. I know in China this same burner has a requirement of 15 PPM NOX and 10 PPM CO and has no problem. I will see what information I can come up with and let you know. I know there are several new burner designs for 30PPM NOX without FGR but low O2 and good turn down."*

Thanks!

**Roehl Fabay**
California Boiler

**APPENDIX C**

## Dillon Kass

**Subject:** FW: low NOx burner information

**From:** Ed Roeleveld <eroeleveld@vitotherm.nl>
**Sent:** Thursday, March 21, 2019 2:10 AM
**To:** Dillon Kass <DKass@windset.com>
**Cc:** Dennis Van Alphen <dennis@totalenergygroup.com>
**Subject:** RE: low NOx burner information

Hello Dillon,

We do not have burners for that.
And I would not recommend using CO2 from burners that do 7 or 9 ppm.
Liquid CO2 is than the safest option.

**Met vriendelijke groet, Kind Regards,**


**Ed Roeleveld | Manager Sales**
**VITOTHERM B.V.-** Overgauwseweg 8 - 2641 NE Pijnacker - Nederland
Tel: +31 (0)15-3694757 **Direct:** +31 (0)6-21819647
**E-mail:** eroeleveld@vitotherm.nl | **Web:** www.vitotherm.nl

---

**Van:** Dillon Kass [mailto:DKass@windset.com]
**Verzonden:** woensdag 20 maart 2019 22:04
**Aan:** info <info@vitotherm.nl>
**Onderwerp:** low NOx burner information

Hello,

Do you make boiler burners that emit 7ppm – 9ppm NOx and near zero carbon monoxide?

We currently have Crone boilers with Zantingh burners and the local Air Pollution Control District is making rules to lower NOx emissions.

We direct the boiler exhaust into our greenhouses and can't have any CO.

Best regards,

Dillon Kass, P.G.
Regulatory Compliance Manager
Windset Farms

1650 Black Road
Santa Maria, CA 93458-9733

Phone: 805 314 2800 x.4443
Cell: 805 868 8117
Email: DKass@windset.com
Web: www.windsetfarms.com

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**APPENDIX D**

Aarbergerweg 9
Rijsenhout
P.O. Box 255
1430 AG Aalsmeer (NL)
Tel. +31 (0)297 219 100
Fax +31 (0)297 219 199
www.zantingh.com

To Whom it may concern

ZANTINGH

| **Contact:** | **Our reference:** | **Direct dial:** | **Date:** |
|---|---|---|---|
| BB/RT | Windset | + 31 (0)297 – 219 100 | 21 March 2019 |
| | | **e-mail:** info@zantingh.com | |

**Regarding: Zantingh burners**

Dear Madam, Sir,

The low NOx gas burners we supply are well known and common used in glass houses for many years in countries all over the world; not only to provide heat but also as CO2 generators. CO2 dosage in glass houses using the flue gasses of natural gas fired burners is an important issue especially for vegetable growers that are in need of a large CO2 volume for growing their crops. Especially also in your situation were you make use of the high-quality state-of-the-art semi-closed greenhouses. In fact modern growers like Windset reduce the CO2 emission of their heating systems almost to zero by bringing the CO2 they produce as fertilization to their crops, which is a large contribute to the environment.

To be able to provide the best quality flue gasses Zantingh worked hard to develop a low NOx combustion system that provides the lowest possible NOx emission with an optimum CO2 content and absolutely zero ppm CO emission. This is necessary because carbon monoxide is very dangerous for people or animals (working) inside the glass houses when dosing CO2. For the same reason all our systems are provided with CO detectors as an extra safety. Also when having CO in combustion Ethane arises in very low concentrations. Difficult to measure, but Ethane is very harmful for the growth of crops. Finding the right balance between these figures has been a real challenge and we are proud that we have reached this point by using so-called in-furnace combustion technology at our complete burner range in capacities between 1 and 15 MW. Next to reaching the best emission standards it is also necessary to keep the O2 figure as low as possible to be able to reach the highest efficiency of the gas installation. Also a low as possible flue gas temperature from boiler to condenser is required and a turn down ratio as high as possible > 6 -1 or higher.

ABN AMRO 49.42.46.294
BIC ABNANL2A
IBAN NL17ABNA0494246294
KvK. A'dam 34041535
BTW nr. NL0015.13.138.B.01

All by all we managed to get your burners always below 25 ppm NOx at 3% O2 with 0 ppm CO by using the best available technology at this point.
As we know going further down in NOx is possible by using external flue gas recirculation (FGR) but as figures show with huge consequences, especially for the amount of carbon monoxide that occurs (levels even up to 400 ppm). For that reason this technology cannot be used yet when gas burners produce flue gasses that are used for CO2 dosing. In fact at our kind of burner combustion systems FGR is an old-fashioned technology that we used at the beginning of the low NOx development and before we ended up with in-furnace technology; a much more elegant, economical and stable technique that is less complex, using less parts, less energy and asking for less maintenance each year. That also means that if the market demand for lower NOx emissions than 25 ppm increases we definitely need to put more R&D into the development of FGR technologies that don't have these disadvantages.

ZANTINGH

We trust to have informed you well enough for the moment. If you may have any questions left please do not hesitate to contact us.

With kind regards,

Zantingh BV

# APPENDIX E

**From:** Egbert de Gelder <egbertdegelder@thermeta.nl>
**Sent:** Thursday, March 28, 2019 7:09 AM
**To:** Dillon Kass <DKass@windset.com>
**Cc:** Lorenzo vd Ark <sales@thermeta.nl>
**Subject:** Re: ultra low NOx burners

Dear Dillon,

I have asked the specialists to inform me the exact CO and NOx-emissions of these two models. One of the specialist is out of the office until monday, so it could take some days.

I expect that the burners will have a CO-emission between 0-5 ppm.

Thermeta is like Zantingh delivering burners for the greenhouse business all over the world. We are situated in the region Westland in The Netherlands, so we know everything about CO2-dosing and the importance of having no CO in the flue gasses.

Regarding CO in flue gasses, the harmful gas in the flue gas is actually not CO; C2H4 (Ethene or Ethylene) is the trouble maker for the crops.
When there is C2H4 in the combustion then there is also CO and CO-detection is 10 times cheaper than C2H4 detection. This is why everyone in the greenhouse business is checking CO to keep the plants healthy instead of checking C2H4.

But looking into the proces of forming C2H4 it is necessary that there is less Oxygen (O2) available; only in that situation you will get CO and C2H4. In fact C2H4 will only exist if there is no O2 left and there is already 40 ppm (or more) CO in the flue gas. This is why most CO-detectors have their alarm level set to 18 - 20 ppm CO (half way the limit of 40 ppm).

Looking into the proces of forming CO, you can devide this in 2 sections.

1. There is too less oxygen available; as a result you will get CO and C2H4
2. There is a surplus of oxygen and the flame becomes too cold to burn 100%; as a result you will get CO but NO C2H4 !!!

The burner MTH is always in section 2 with a lot of oxygen; so no C2H4 can be formed in standard situation, so it is perfectly safe for the crops / plants. I'm convinced this combustion is also realizing a very low CO emission of lower than 5 ppm.

Kind regards / Met vriendelijke groet,
Egbert de Gelder

Op wo 27 mrt. 2019 om 18:50 schreef Dillon Kass <DKass@windset.com>:

> Hello Egbert,
>
> Following up on my questions below, can you please provide some information on carbon monoxide concentrations for these models #420-7 & #504-7?
>
> Your help is greatly appreciated!
>
> Dillon Kass
> Windset Farms
>
> Cell: 805 868 8117
>
> Email: DKass@windset.com
>
> ---
>
> **From:** Dillon Kass
> **Sent:** Tuesday, March 26, 2019 9:56 AM
> **To:** 'Egbert de Gelder' <egbertdegelder@thermeta.nl>
> **Cc:** 'Lorenzo vd Ark' <sales@thermeta.nl>
> **Subject:** RE: ultra low NOx burners
>
> Hi Egbert – one other question: What are the carbon monoxide emissions of the two burner models #420-7 & #504-7?
>
> Dillon Kass
> Windset Farms
>
> Cell: 805 868 8117
>
> Email: DKass@windset.com
>
> ---
>
> **From:** Dillon Kass
> **Sent:** Tuesday, March 26, 2019 8:12 AM
> **To:** 'Egbert de Gelder' <egbertdegelder@thermeta.nl>
> **Cc:** Lorenzo vd Ark <sales@thermeta.nl>
> **Subject:** RE: ultra low NOx burners
>
> Hello Egbert,
>
> We use our existing boilers/burners for heat and CO2 generation for plant growth inside the greenhouses. Could you please describe what concentrations of CO2 we would get with the Burner Models #420-7 and #504-7?
>
> Thanks,
>
> Dillon Kass
> Windset Farms
>
> Cell: 805 868 8117
>
> Email: DKass@windset.com

**From:** Egbert de Gelder <egbertdegelder@thermeta.nl>
**Sent:** Thursday, March 21, 2019 8:04 AM
**To:** Dillon Kass <DKass@windset.com>
**Cc:** Lorenzo vd Ark <sales@thermeta.nl>
**Subject:** Re: ultra low NOx burners

Hello Dillon,

With a Crone CET boiler our Thermeta burner will produce 35 mg/Nm3 @ 3% O2 (= 41 mg/Nm3 @ 0% O2) (= 20 ppm NOx @ 0% O2).

However we can provide you an Industrial Combustion burner type MTH which achieves Ultra-low-NOx emissions up to 9 ppm without FGR. See the attached brochure and technical leaflet.

You will probably need the MTH 504-7 (according to the attached brochure). We can provide you the necessary gas train and boiler control panel for burner, boiler, condenser and CO2-unit as well.

Please let me know if you are interested and who you would want to install the equipment.

Kind regards / Met vriendelijke groet,

Egbert de Gelder

---------- Forwarded message ---------
From: **Dillon Kass** <DKass@windset.com>
Date: wo 20 mrt. 2019 om 22:09
Subject: ultra low NOx burners
To: info@thermeta.nl <info@thermeta.nl>

Hello,

Do you make boiler burners that emit 7ppm – 9ppm NOx and near zero carbon monoxide?

We currently have Crone boilers with Zantingh burners and the local Air Pollution Control District is making rules to lower NOx emissions.

We direct the boiler exhaust into our greenhouses and can't have any CO. We are evaluating possible burner replacement options.

Best regards,

Dillon Kass, P.G.
Regulatory Compliance Manager
Windset Farms

1650 Black Road
Santa Maria, CA 93458-9733

Phone: 805 314 2800 x.4443
Cell: 805 868 8117

Email: DKass@windset.com
Web: www.windsetfarms.com

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## Timothy J. Mitro

**From:** Laura Nuzzo <laura@nuzzoenvironmental.com>
**Sent:** Tuesday, June 4, 2019 10:10 AM
**To:** Timothy J. Mitro
**Cc:** Rick Clark
**Subject:** ERG Operating Company - Proposed Rule 361 Comments

Good Morning Tim,

I have been working with ERG Operating Company to investigate options for their two 4.9 MMBTU/hr CHF Heaters at their GWP Facility. The District refers to the units as Process Heater #1 and #2.

Under the proposed changes to Rule 361, in order to meet the AB 617 BARCT standards, the heaters are required to emit at 9 ppm NOx or less. ERG has been working over the past several months with the manufactures of the units to determine if there is any feasible way to retrofit the units to meet the 9 ppm limit. Due to the units' unique configuration, there is no solution, short of complete replacement of the units, that would reduce the NOx emissions below 30 ppm.

I have provided a summary of the options below, along with a rough estimate of the cost-effectiveness for each one.

Option 1: Achieve 30 ppm NOx via modification to existing units (not including burner replacement).
Option 1 Cost: $350K capital + $10K/yr operational
Option 1 Cost=Effectiveness: $47,600/ton NOx

Option 2: Achieve 9 ppm NOx via replacement of existing units with new units.
Option 2 Cost: $3.2M capital
Option 2 Cost-Effectiveness: $241,000/ton NOx

I understand that we are getting close to the end of the public comment period and hearing date. ERG would be happy to meet either in person or via conference call to discuss their options. Please let me know how you would like to proceed.

Best regards,
Laura Nuzzo

**Laura M. Nuzzo**
President/Senior Environmental Engineer
NUZZO ENVIRONMENTAL, INC.
*Certified Small Business (SB)/Disabled Veteran Business Enterprise (DVBE)*
176 Seacliff Drive
Pismo Beach CA 93449
805-441-8496
**laura@nuzzoenvironmental.com**

# ATTACHMENT C

## Response to Public Comments

# Attachment C: Response to Public Comments

| # | Description | Comment | District Response |
|---|---|---|---|
| 1 | March 29, 2019, Windset Farms: $CO_2$ boilers Retrofit Feasibility | Based on the research we have done to explore our options for replacing the boiler burners to comply with Rule 342, our findings indicate there are no available burner replacements at this time that would allow us to continue operating our boilers to match the combination of outputs we are currently receiving, abundant heat and $CO_2$, with near-zero carbon monoxide.<br>Windset Farms respectfully requests an exemption to Rule 342 for natural gas boilers with capacities of 5 MMBtu/hr and greater operated at horticultural greenhouse facilities in Santa Barbara County, until such time that the burner manufacturers provide a solution to comply with your requirements, and also provide the outputs required for successful greenhouse production. | The District has reviewed the information provided and agrees that ultra-low NOx burner retrofits and/or full burner replacements may not be able to maintain near-zero carbon monoxide levels. Hence, the District has established a new BARCT standard for boiler operations that provide $CO_2$ to crops, which is set at 30 ppm NOx and 10 ppm carbon monoxide. The full analysis regarding these emission standards has also been incorporated into Section 4.6 of the staff report.<br>In regards to your request for an exemption from Rule 342, the District cannot grant such a request. AB 617 requires BARCT to be implemented at the AB 617 industrial sources, and the Rule 342 amendments are necessary to make sure that the BARCT emission standards are enforceable. |
| 2 | June 4, 2019, ERG Resources: BARCT Cost-effectiveness | Under the proposed changes to Rule 361, in order to meet the AB 617 BARCT standards, the heaters are required to emit at 9 ppm NOx or less. ERG has been working over the past several months with the manufacturer of the units to determine if there is any feasible way to retrofit the units to meet the 9 ppm limit. Due to the units' unique configuration, there is no solution, short of complete replacement of the units that would reduce the NOx emissions below 30 ppm. | As stated in the December 2018 staff report for the AB 617 BARCT Rule Development Schedule, a facility may need to install new air pollution controls on their existing unit, or replace the unit in part or in whole to meet the BARCT emission limits. The two process heaters in question are over 40 years old and are past their normal project life. It is understandable that such old units may not be able to be retrofitted to meet the 9 ppm NOx standard, and they would instead need to be replaced with new units.<br>For this rule project, the cost-effectiveness calculation compared the incremental cost difference between installing a replacement unit at 30 ppm NOx and a replacement unit at 9 ppm NOx. Based on the District's research, available manufacturer data, and information from other air districts, this replacement is still considered to be cost-effective. |

Resolution in the Matter of
Rule 361, Small Boilers, Steam Generators and Process Heaters,
and
Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers,
Steam Generators and Process Heaters

# ATTACHMENT #E

# Proposed Rule 361

Proposed amended rule text is provided in strikeout and underlined format.
Strikeout indicates text proposed for deletion.
Underlined text indicates proposed new text.

**RULE 361.** ~~**SMALL BOILERS, GENERATORS, AND PROCESS HEATERS**~~ **BOILERS, STEAM GENERATORS, AND PROCESS HEATERS (Between 2-5 MMBtu/hr)**
(Adopted 1/17/2008, revised 6/20/2019)

## A. Applicability

This rule shall apply to any boiler, steam generator, or~~and~~ process heater with a rated heat input capacity ~~of~~ greater than 2 million British thermal units per hour and less than 5 million British thermal units per hour.

## B. Exemptions

1. The provisions of this rule shall not apply to:

   a. P~~p~~rocess heaters, kilns, furnaces, and dryers, where the products of combustion come into direct contact with the material to be heated.

   b. E~~e~~quipment that does not require a permit under the provisions of Rule 202, Exemptions to Rule 201.~~G.~~ Notwithstanding the above, this exemption shall not apply to any AB 617 Industrial Unit.

   ~~c. existing units until March 15, 2016.~~

2. Section D.1 and D.3 requirements shall not apply to any ~~dual fuel~~ unit while forced to burn non-gaseous fuel during times of public utility imposed natural gas curtailment. This exemption shall not exceed 168 cumulative hours of operation per calendar year excluding equipment testing time not exceeding 24 hours per calendar year.

## C. Definitions

See Rule 102, Definitions, for definitions not limited to this rule. For the purposes of this rule, the following definitions shall apply:

**"AB 617 Industrial Unit"** means any unit located at a facility that, as of January 1, 2017, was subject to a market-based compliance mechanism adopted by the state board pursuant to Health and Safety Code §38562(c).

**"Annual Heat Input"** means the total heat input of fuels burned by a unit in a calendar year, as determined from the higher heating value and cumulative annual usage of each fuel.

**"Atmospheric Unit"** means any unit with a non-sealed combustion chamber in which natural draft is used to exhaust combustion gases.

**"Boiler or Steam Generator"** means any combustion equipment ~~permitted to be~~ fired with liquid and/or gaseous and/or solid ~~fossil~~ fuel~~,~~ that is used to produce steam or to heat water. Boiler or Steam Generator does not include any fired or unfired waste heat recovery boiler that is used to recover or augment~~sensible~~ heat from the exhaust of any combustion equipment.

**"Digester Gas"** means gas derived from the decomposition of organic matter in a digester.

**"Existing Unit"** means any unit installed prior to January 17, 2008 which ~~is~~has not been~~a~~ modified ~~unit~~ as defined herein. Any unit that is an AB 617 Industrial Unit, as defined in this rule, is not considered an existing unit.

**"Field Gas"** means any gaseous fuel extracted from a production well that:

1. is processed and/or used as fuel in equipment located in the same oil and gas production field as the production well, and

2. does not meet the California Public Utility Commission quality pipeline standards as specified in *General Order 58-A*.

~~**"Higher Heating Value (HHV)"** means the total heat liberated per mass of fuel burned (British thermal unit per pound), when fuel and dry air at standard conditions undergo complete combustion and all resulting products are brought to their standard states at standard conditions.~~

**"Landfill Gas"** means gas derived from the decomposition of waste in a landfill.

~~**"Modified Unit"** means any unit that has a burner or burners replaced or where the unit is replaced in its entirety on or after January 17, 2008. Modified units are considered new units.~~

**"Modification" or "Modify"** means any of the following actions:

1. Replacing a burner or burners on a unit; or

2. Removing a unit from the site of its original installation and installing it at a different location. A unit that is reinstalled within the same stationary source is not modified.

~~**"New Unit"** means any unit that is not an existing unit. A modified unit is considered a new unit.~~

**"Process Heater"** means any external combustion equipment ~~permitted to be~~ fired with liquid and/or gaseous ~~fuel~~ and/or solid fuel and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven used for drying, baking, curing, cooking, calcinating or vitrifying or any unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment.

**"Rated Heat Input Capacity"** ~~(million British thermal units per hour)~~ means the heat input capacity specified on the manufacturer's nameplate of the combustion unit, typically reported in million Btu per hour. If the combustion unit has been physically modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the modified maximum heat input shall be considered as the rated heat input. The new maximum heat input must be certified, in writing, by the manufacturer or installer and engineering calculations supporting the new maximum heat input rating must be submitted to and approved by the District. The District may require the modified maximum heat input capacity to be demonstrated by a fuel meter while operating the unit at maximum capacity.

**"Parts Per Million" or "ppm"** means parts per million by volume expressed on a dry gas basis.

**"Shutdown Period"** means the period of time during which a unit is taken from an operational to a non-operational status by allowing it to cool down from its operating temperature to a cold or ambient temperature as the fuel supply is turned off.

**"Startup Period"** means the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure.

**"Unit"** means any boiler, steam generator, or process heater.

~~**"Utility Natural Gas"** means natural gas supplied by a public gas utility company that meets Public Utility Commission quality pipeline standards as specified in *General Order 58-A.*~~

**D. Requirements – Emission Standards**

1. For units that are installed prior to January 1, 2020:

a. By January 1, 2020, ~~N~~no owner or operator shall operate ~~any new or modified unit or, after January 1, 2020,~~ any existing unit~~,~~ in excess of the emission limits set forth in Table 1 below; and ~~following limits, subject to Section D.2 below:~~

b. No owner or operator shall operate any unit that was installed or modified between January 17, 2008 and December 31, 2019 in excess of the emission limits set forth in Table 1 below. ~~Oxides of Nitrogen emissions shall not exceed 30 parts per million by volume at 3 percent oxygen.~~

~~c. Carbon Monoxide emissions shall not exceed 400 parts per million by volume at 3 percent oxygen.~~

**Table 1: Emission Limits for Units Installed Prior to January 1, 2020**

| Fuel Type | NOx Emission Limit (ppm at 3% O2) | CO Emission Limit (ppm at 3% O2) |
|---|---|---|
| All Fuels | 30 | 400 |

2. The provisions of Section D.1 shall not apply to any existing unit that meets the following:

a. The existing unit operates with an annual heat input, from all fuels, at or below 1.8 billion British thermal units per calendar year as verified by a District ~~-~~approved, non-resettable, temperature and pressure corrected, totalizing fuel meter ~~that is installed no later than December 31, 2016~~; and

b. The owner or operator implements the District ~~-~~approved *Rule 361 Compliance Plan* that was submitted to the District prior to March 15, 2016 ~~required under Section K.3 for the life of the unit~~; and

c. The owner or operator demonstrates to the Control Officer compliance with the requirements specified in Sections F, G, ~~H and~~ I, and J.

3. On or after January 1, 2020, no owner or operator shall install or modify any unit unless the unit complies with the emission limits set forth in Table 2 below.

**Table 2: Emission Limits for Units Installed On or After January 1, 2020**

| Fuel Type | NOx Emission Limit (ppm at 3% O2) | CO Emission Limit (ppm at 3% O2) |
|---|---|---|
| Natural Gas or Field Gas: non-atmospheric units | 9 | 400 |
| Natural Gas or Field Gas: atmospheric units | 12 | 400 |
| Landfill Gas | 25 | 400 |
| Digester Gas | 15 | 400 |
| Liquefied Petroleum Gas | 20 | 400 |
| All other fuels | 30 | 400 |

4. On or before June 20, 2020, all AB 617 Industrial Units shall operate in compliance with the emission limits specified in Section D.3.

**E. Requirement - Loss of Low--Use Exemption**

Any owner or operator of any existing unit ~~claiming~~that qualified for the Section D.2 low--use exemption where the unit's annual heat input in any calendar year exceeds 1.8 billion British thermal units shall comply with the following:

1. Within 120 days after the end of the calendar year during which the unit exceeded 1.8 billion British thermal units of annual heat input, submit an Authority to Construct permit application for installation of control equipment or a replacement unit; and

2. Within 365 days after the end of the calendar year during which the unit exceeded 1.8 billion British thermal units of annual heat input, demonstrate to the Control Officer and maintain compliance with Section D.3~~1~~ for the life of the unit; and

3. Maintain compliance with the remaining requirements of Section D.2 until compliance with Section D.3~~1~~ is achieved.

**F. Requirements – Compliance Determination**

1. Any owner or operator of any unit fired exclusively on ~~utility~~ natural gas and any unit subject to the Section D.2 low-use exemption shall be tuned-up pursuant to the requirements of Section G~~I~~. The District may, at its discretion, require any owner or operator of any unit subject to this rule to perform a source test per the test methods listed in Section H~~J~~. An owner or operator may choose to comply with this section by performing District-approved source testing in lieu of tune-ups.

2. Except for units subject to the Section D.2 low-use exemption, any owner or operator of any unit ~~not~~ fired on fuels other than~~exclusively on utility~~ natural gas shall perform District-approved source testing not less than once every 24 months using the source test methods listed in Section H~~J~~. After the third required compliance source test, the District may, at its discretion, allow the owner or operator of the unit to perform tune-ups in lieu of source testing per the requirements of Section G~~I~~.

3. All emission determinations shall be made in the as-found operating condition, except no compliance determination shall be established during unit start-up, shutdown, or under breakdown conditions.

~~3.~~4. Start-up or shutdown intervals shall not last longer than is necessary to reach stable temperatures and conditions. All emission control systems shall be in operation and emissions shall be minimized, to the extent possible, during startup and shutdown periods.

~~4. Any owner or operator of any unit found not to be in compliance with Section D.1 requirements as a result of the tune-up procedure shall notify the District in writing within 7 days. The notification shall include a copy of the *Rule 361 Tune-Up Report*, the actions taken to get the unit into compliance, and the next steps to achieve compliance. Failure to bring the unit into compliance with the requirements of Section D.1 within 15 days of the initial tune-up attempt shall constitute a violation of this rule.~~

~~**G. Requirements – Recordkeeping**~~

~~All owners or operators of units subject to this rule shall keep all records listed below onsite for a period of five years and the records shall be made readily available to the District upon request:~~

~~1. *Rule 361 Tune-Up Reports* and test firing records.~~

~~2. Source test reports.~~

~~3. For existing units subject to Section D.2:~~

~~a. Monthly and annual fuel use logs for each fuel type.~~

~~b. Meter calibration records.~~

~~4. Records of emergency nongaseous fuel use per Section B.2. These records shall include the dates, operating hours, and volumes of nongaseous fuel used and documentation of fuel sulfur content.~~

~~**H. Requirements - Reporting**~~

~~1. The records required pursuant to Section G shall be submitted to the District by March 1st for the prior calendar year.~~

~~2. Source test reports shall be submitted to the District within 45 days of test completion.~~

**~~I.~~G. Requirements – Unit Tuning**

The owner or operator of any unit subject to the tune-up requirements of this rule shall comply with the following requirements:

1. Perform tuning at least twice per year, (at intervals from 4 to 8 months apart) in accordance with the procedures described in the attached District Rule 361 Tune-Up Procedures. Units subject to the Section D.1 or D.3 emission standards shall follow the procedure requirements to measure oxides of nitrogen and carbon monoxide levels using a District-approved, calibrated portable analyzer.

2. If the unit does not operate throughout a continuous six-month period within a calendar year, then only one tune-up is required for that calendar year.

3. No tune-up is required during a calendar year for any unit that is not operated during that calendar year.~~;~~ ~~this~~The unit may still be test fired to verify availability of the unit for its intended use, but once test firing is completed, it shall be shutdown. If test firing exceeds 24 hours per year, then within thirty (30) days of exceeding the 24 hour per year limit, a tune-up~~s~~ shall be conducted pursuant to ~~follow the requirements of~~ this ~~S~~section ~~I.1~~.

4. Any owner or operator of any unit found to be in noncompliance with Section D requirements as a result of the tune-up procedure shall notify the District in writing within 7 days. The notification shall include a copy of the *Rule 361 Tune-Up Report*, the actions taken to get the unit into compliance, and the next steps to achieve compliance. Failure to bring the unit into compliance with the requirements of Section D.1 and D.3 within 15 days of the initial tune-up attempt shall constitute a violation of this rule.

**~~J.~~H. Requirements - Source Testing**

~~1. The owner or operator of any unit subject to this Rule shall perform an initial source test on each unit at the time of installation and modification to verify compliance with the oxides of nitrogen and the carbon monoxide emission limits of Section D.1.a and D.1.b. After the initial source test, source tests shall be performed biennially to demonstrate compliance with Section D.1.a and Section D.1.b. For facilities with more than 10 units subject to Section D.1.a and Section D.1.b requirements, the Control Officer may, on a case-by-case basis, approve an alternate source test schedule for up to one half of the units every other year. Such a request shall be submitted with the Plan required in Section J.2.~~

~~2.~~1. The owner or operator of any unit subject to the source testing provisions of this ~~R~~rule shall submit a Source Test Plan to the District and obtain District written approval prior to the start of any source test. The ~~draft~~ Source Test Plan shall be filed with the District at least 30 days before the start of each source test. The District shall be notified of the date of source testing ~~a unit~~ at least 14 days prior to testing to arrange a mutually agreeable test date.

~~3.~~2. Source testing shall be performed by a source test contractor certified by the California Air Resources Board. District required source testing shall not be performed by an owner or operator unless approved by the Control Officer.

~~4.~~3. The owner or operator of any unit subject to the source test requirements of this rule shall use the test methods and procedures listed below:

a. Oxides of Nitrogen: Environmental Protection Agency Method 7E~~10~~ or California Air Resources Board Method 100.

b. Carbon ~~m~~Monoxide: Environmental Protection Agency Method 10~~7E~~ or California Air Resources Board Method 100.

c. Stack Gas Oxygen: Environmental Protection Agency Method 3 or 3A or California Air Resources Board Method 100.

~~c.~~d. Fuel rate: District-approved metering system, calibrated within 60 calendar days of the test date. ~~-~~Public Utility Company regulated fuel meters relied on by operators for testing may be allowed an alternative calibration schedule upon approval by the Control Officer. Results must be corrected for pressure and temperature to standard conditions.

~~d. Determination of the stack gas smoke spot number using one of the following methods:~~

~~1. American Society of Testing and Materials ASTM D2156-94 (2003), "Standard Test Method for Smoke Density in Flue Gases from Burning Distillate Fuels", American Society of Testing and Materials International.~~

~~2. Bacharach True Spot® Smoke Test Kit.~~

~~3. Alternative methods for determining the stack gas smoke spot number approved by the Control Officer in writing.~~

~~e. Any alternative source test method approved in writing by the Control Officer that is found to be comparable in accuracy to the procedure in this Section and approved by the Air Resources Board and the Environmental Protection Agency.~~

~~f.~~e. All source tests shall consist of~~At~~ a minimum~~,~~ of three 30 minute tests ~~runs shall be performed for compliance with Sections J.4.a and J.4.b~~. The average concentration from the ~~three~~ test runs shall be used for determining compliance.

## I. Requirements – Recordkeeping

All owners or operators of units subject to this rule shall keep all records listed below onsite for a period of five years and the records shall be made readily available to the District upon request:

1. *Rule 361 Tune-Up Reports* and test-firing records.

2. Source test reports.

3. For existing units subject to the Section D.2 low-use exemption:

a. Monthly and annual fuel use logs for each fuel type.

b. Fuel meter calibration records.

4. Records of emergency non-gaseous fuel use per Section B.2. These records shall include the dates, operating hours, and volumes of non-gaseous fuel used.

**J. Requirements – Reporting**

1. The records required pursuant to Section I.1, I.3, and I.4 shall be submitted to the District by March 1st for the prior calendar year.

2. Source test reports, required pursuant to Section I.2, shall be submitted to the District within 45 days of test completion.

**K. Compliance Schedule – Existing Units**

The owner or operator of any existing unit subject to this rule shall meet the following compliance schedule:

~~1. Existing units shall apply for a Permit to Operate by April 16, 2008 in accordance with Rule 202.~~

~~2. Obtain an Authority to Construct permit prior to installation or modification of any new or modified unit.~~

~~3. The owner or operator of any unit requesting the low use exemption in Section D.2 shall comply with the requirement to submit a *Rule 361 Compliance Plan* for District review and approval prior to March 15, 2016. The District approved fuel meters shall be installed by no later than December 31, 2016. The *Rule 361 Compliance Plan* shall include:~~

~~a. The company name, District Facility ID number, facility address, current operating permit number, facility contact information.~~

~~b. A list of all subject units with their rated heat input capacity, District Device ID number, anticipated annual heat input.~~

~~c. For gaseous fuels, the proposed non-resettable temperature and pressure corrected totalizing fuel meter(s) specifications. For liquid fuels, the proposed non-resettable totalizing fuel meter(s) specifications. For solid fossil fuels, provide the methods of fuel throughput monitoring to be used that will achieve the same level of fuel monitoring accuracy as the meters required for the measurement of gaseous and liquid fuels described above. Include the fuel meter manufacturer, model number, technical brochure, and manufacturer recommended calibration schedule.~~

~~d. For each unit, identify which Rule 361 Tuning Procedure will be used (see Attachment).~~

~~4. On or before January 30, 2019, the owner or operator of any existing unit shall:~~

~~a. For units subject to Section D.1 emission standards, apply for an Authority to Construct permit.~~

~~b. For units subject to the Section D.2 low use provision, provide the annual fuel heat input data for years 2017 and 2018.~~

~~5.~~1. On or before January 1, 2020, the owner or operator of any existing unit shall: ~~demonstrate final compliance with this Rule.~~

a. For units subject to the Section D.1 emission standards, demonstrate final compliance with the emission standards in Section D.1.

b. For units subject to the Section D.2 low-use exemption, conduct the initial tune-up pursuant to Section G.

**L. Compliance Schedule – AB 617 Industrial Units**

1. On or before September 20, 2019, the owner or operator of any AB 617 Industrial Unit that does not meet the emission standards in Section D.3, as listed in the unit's Permit to Operate, shall apply for an Authority to Construct permit.

2. On or before June 20, 2020, the owner or operator of any AB 617 Industrial Unit shall operate in compliance with the emission standards in D.3.

## ATTACHMENT

## SBCAPCD Rule 361 Tune-Up Procedures[1]

### PROCEDURE A
### Equipment Tuning Procedure for Forced Draft-Fired Equipment[2]

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

As used in this procedure, the requirement to measure Oxides of Nitrogen ($NO_x$) ~~readings~~ is only required if the unit being tuned is subject to the requirements of Section D.1 or D.3 ~~(i.e., 30 ppmvd at 3 % oxygen [$O_2$])~~. NOx (as $NO_2$) measurements shall be taken with a portable analyzer in accordance with the South Coast Air Quality Management District (SCAQMD) Combustion Gas Periodic Monitoring Protocol (May 1, 2009), or an equivalent method approved by the Control Officer. ~~Only District-approved portable $NO_x$ and CO analyzers may be used.~~ The portable analyzer shall be calibrated ~~per ASTM Test Method D-6522-00 (reapproved 2005) prior to each use.~~ in accordance with the SCAQMD Combustion Gas Periodic Monitoring Protocol (May 1, 2009), and ~~C~~calibration records shall be submitted as part of the *Rule 361 Tune-Up Report*. ~~Analyzer readings shall be taken pursuant to ASTM Test Method D-6522-00 (reapproved 2005).~~ Steps in the Tune-Up Procedure below not applicable to specific units may be omitted.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.

2. At this firing rate, record stack gas temperature, oxygen concentration, and carbon monoxide concentration and $NO_x$ concentration (also record the smoke-spot number[3] for liquid fuels only) and the observed flame condition after unit operation stabilizes at the firing rate selected. Note these readings in the *Rule 361 Tune-Up Report* as the *"Initial As-Found Conditions."*~~.~~ If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values[4], and if the carbon monoxide emissions are low and there is no~~t~~ smoke, the unit is probably operating at near optimum efficiency ~~–~~at this particular firing rate. However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical. ~~For units subject to Section D.1, n~~Note whether the $NO_x$ and carbon monoxide values comply with the applicable limits specified in the unit's Permit to Operate.

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[1] These Rule 361 tune-up procedures differ from SCAQMD Rule 1146.1 and Ventura Rule 74.15.1 since~~(e.g., $NO_x$ (as $NO_2$)~~ readings are required to be taken in addition to the CO reading if the unit is subject to a 30 ppm (or lower) NOx limit, as specified in the rule~~Section D.1)~~.

[2] This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for the EPA.

[3] The smoke-spot number can be determined with ~~American Society of Testing and Materials~~ ASTM Test Method D~~-~~2156-0994 (201303), "Standard Test Method for Smoke Density in Flue Gases from Burning Distillate Fuels," ~~American Society of Testing and Materials International~~ or with the Bacharach method.

[4] Typical minimum oxygen levels for boilers at high firing rates are:
   a. For natural gas: 0.5% - 3%
   b. For liquid fuels: 2% - 4%

3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the stack gas temperature, oxygen concentration, carbon monoxide concentration, $NO_x$ concentration (also record the smoke-spot number[5] for liquid fuels only), and the observed flame condition for these higher oxygen levels after boiler operation stabilizes.

4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level, gradually reduce the combustion air flow~~,~~ in small increments. After each increment, record the stack gas temperature, oxygen concentration, carbon monoxide concentration, $NO_x$ concentration, smoke-spot number (for liquid fuels) and the observed flame condition.

5. Continue to reduce combustion air flow stepwise~~,~~ until one of these limits in reached:

   a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.

   b. Stack gas carbon monoxide concentrations greater than 400 ppm~~vd~~ or $NO_x$ concentrations greater than the applicable limit as specified in the unit's Permit to Operate~~30 ppmvd (as corrected to 3% $O_2$)~~.

   c. Smoking at the stack.

   d. Equipment-related limitations - such as low windbox/furnace pressure differential, built in air-flow limits, etc.

6. Develop an oxygen/carbon monoxide curve (for gaseous fuels) or oxygen/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 using the excess oxygen~~,~~ and carbon monoxide or smoke-spot number data obtained at each combustion air flow setting.

7. From the curves prepared in Step 6, find the stack gas oxygen levels where the carbon monoxide emissions or smoke-spot number equal the following values:

| Fuel | Measurement | Value |
|---|---|---|
| Gaseous | carbon monoxide ~~E~~emissions | 400 parts per million |
| #1 & #2 oils | smoke-spot number | number 1 |
| #4 oil | ~~oil~~ smoke-spot number | number 2 |
| #5 oil | ~~oil~~ smoke-spot number | number 3 |
| Other oils | smoke-spot number | number 4 |

   The above conditions are referred to as the carbon monoxide or smoke threshold, or as the minimum excess oxygen level.

   Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0 percent to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.

~~[5] The smoke-spot number can be determined with American Society of Testing and Materials ASTM Test Method D 2156-94 (2003), "Standard Test Method for Smoke Density Flue Gases from Burning Distillate Fuels," American Society of Testing and Materials International or with the Bacharach method.~~

9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.

10. Verify that the new settings can accommodate the sudden changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 54 result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates. Next, verify these new settings in a similar fashion. Then make sure that the final control settings are recorded at steady-state operating conditions for future reference.

11. Take a final combustion analysis for $NO_x$ concentration, carbon monoxide concentration and oxygen concentration (also record the smoke-spot number for liquid fuels only). Note these readings, as well as the stack temperature and flame condition, in the *Rule 361 Tune-Up Report* as the *"Final As-Tuned Conditions."*. Confirm that the final settings result in compliance with the regulatory limits. **If compliance with the emission limits specified in the unit's Permit to OperateSection D.1 is not achievable, takes actions and provide notification to the District pursuant to the requirements of Section FG.4**.

12. When the above checks and adjustments have been made, prepare a *Rule 361 Tune-Up Report*. The report shall include all recorded data and combustion analysis data for the unit; the manufacturer, model number and serial number of the portable NOx/CO analyzer; the name, title, signature, company name, and contact information of person performing the tune-up; and date the tune-up was performed. The *Rule 361 Tune-Up Report* shall clearly indicate the *"Initial As-Found Conditions"* and the *"Final As-Tuned Conditions"* and shall (if applicable) state whether Section D.1 and D.3 emission standards for $NO_x$ and COcarbon monoxide were met. Calibration records shall be submitted as part of the *Rule 361 Tune-Up Report*.

*NOTE*

The owner/operator may propose an alternative tuning procedure that meets the same basic requirements of the procedure outlined above for District review and approval. The District may assess fees to reimburse its costs associated with the review of the alternative procedure using either Section I.C.d or Section III.C of Rule 210, Fees. District approval of the alternative tuning procedure must be obtained prior to its use.

**Figure 1**
Oxygen/Carbon Monoxide Characteristic Curve

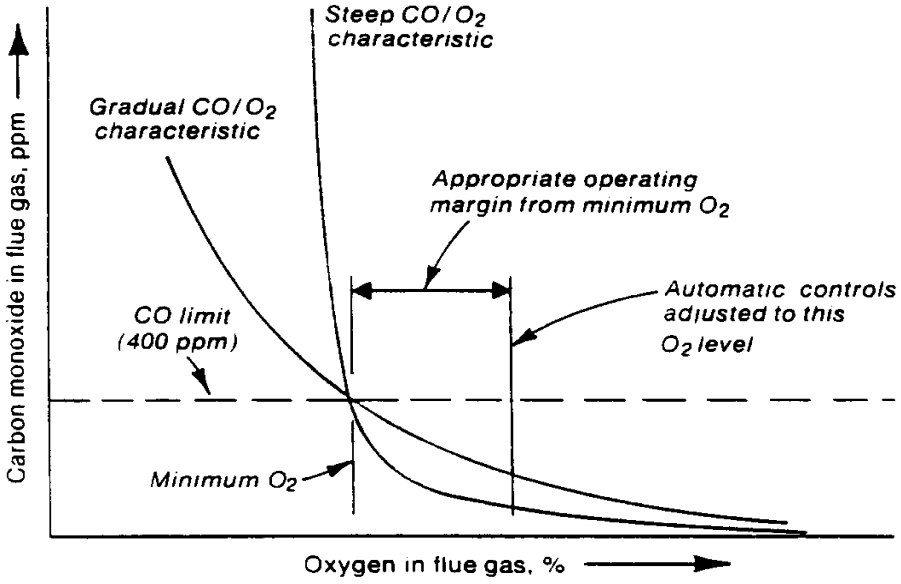
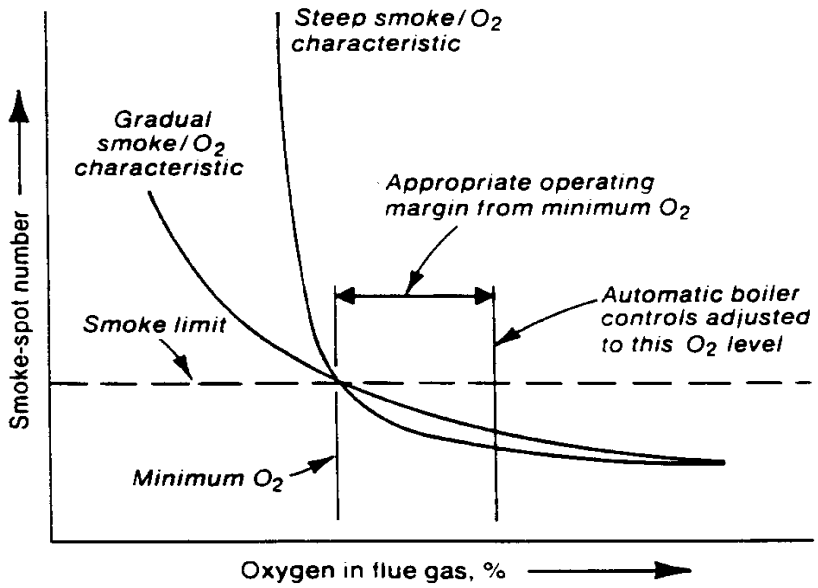



**Figure 2**
Oxygen/Smoke Characteristic Curve



**PROCEDURE B**
**Equipment Tuning Procedure for Natural Draft-Fired Equipment**

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

As used in this procedure, the requirement to measure Oxides of Nitrogen ($NO_x$) ~~readings~~ is only required if the unit being tuned is subject to the requirements of Section D.1 or D.3~~(i.e., 30 ppmvd at 3% oxygen [$O_2$]).~~ NOx (as $NO_2$) measurements shall be taken with a portable analyzer in accordance with the South Coast Air Quality Management District Combustion Gas Periodic Monitoring Protocol (May 1, 2009), or an equivalent method approved by the Control Officer. ~~Only District-approved portable $NO_x$ and CO analyzers may be used.~~ The portable analyzer shall be calibrated ~~per ASTM Test Method D-6522-00 (reapproved 2005) prior to each use.~~ in accordance with the SCAQMD Combustion Gas Periodic Monitoring Protocol (May 1, 2009), and ~~C~~calibration records shall be submitted as part of the *Rule 361 Tune-Up Report*. ~~Analyzer readings shall be taken pursuant to ASTM Test Method D-6522-00 (reapproved 2005).~~ Steps in the Tune-Up Procedure below not applicable to specific units may be omitted.

1. PRELIMINARY ANALYSIS~~Preliminary Analysis~~

   a. Verify that the boiler, steam generator, or process heater (unit) is operating at the lowest pressure or temperature that will satisfy load demand. This pressure or temperature will be used as a basis for comparative combustion analysis before and after tune-up.

   b. Verify that the unit operates for the minimum number of hours and days necessary to perform the work required.

   c. Verify that the size of air supply openings is in compliance with applicable codes and regulations. Air supply openings must be fully open when the burner is firing and air flow must be unrestricted.

   d. Verify that the vent is in good condition, properly sized and free from obstruction.

   e. Perform an as-found (i.e., prior to any adjustments) combustion analysis for carbon monoxide concentration, $NO_x$ concentration, oxygen concentration and measure the stack temperature and note the flame condition at both high and low fire, if possible. Note these readings in the *Rule 361 Tune-Up Report* as the *"Initial As-Found Conditions"*. Also record the following:

      (1) Inlet fuel pressure at burner at high and low firing rates.

      (2) Pressure above draft hood or barometric damper at high, medium, and low firing rates.

      (3) Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the unit.

      (4) Inlet fuel use rate if meter is available.

2. CHECKS AND CORRECTIONS

   a. Clean all dirty burners or burner orifices. Verify that fuel filters and moisture traps are in place, clean, and operating properly. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Replace or repair all damaged or missing burner parts.

   b. Remove external and internal sediment and scale from heating surfaces.

c. Verify that the necessary water or process fluid treatment is being used to minimize scale and corrosion. Confirm flushing and/or blowdown schedule.

d. Repair all leaks. In addition to the high-pressure lines, check the blow-off, drain, safety valve, bypass lines, and, if used, the feed pump.

3. SAFETY CHECKS

a. Test primary and secondary low water level controls.

b. Check operating and limit pressure and temperature controls.

c. Check pilot safety shut off operation.

d. Check safety valve pressure setting and verify that the setting is consistent with unit load requirements.

e. Check limit safety control and spill switch.

4. ADJUSTMENTS

Perform the following checks and adjustments on a warm unit at high fire:

a. Adjust unit to fire at the maximum inlet fuel use rate: record fuel manifold pressure.

b. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at high, medium, and low firing rates. The carbon monoxide value should not exceed 400 parts per million at 3% oxygen.

c. Verify that unit light-offs are smooth and safe. Perform a reduced fuel pressure test at both high and low firing rates in accordance with the manufacturer's instructions.

d. Check and adjust the modulation controller. Verify proper, efficient, and clean combustion through the range of firing rates.

When optimum performance has been achieved, record all data.

5. FINAL TEST

After adjustments, perform a final combustion analysis for carbon monoxide concentration, $NO_x$ concentration, oxygen concentration, and measure the stack temperature and note the flame condition on the warm unit at high, medium, and low firing rates, if possible. Note these readings in the *Rule 361 Tune-Up Report* as the "*Final As-Tuned Conditions*". Also record the following:

~~i.~~a. Inlet fuel pressure at burner at high, medium, and low firing rates.

~~ii.~~b. Pressure above draft hood or barometric damper at high, medium, and low firing rates.

~~iii.~~c. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the unit.

~~iv.~~d. Inlet fuel use rate if meter is available.

If the unit is subject the Section D.1 or D.3 limits for $NO_x$ ~~(30 ppmvd at 3% $O_2$)~~ and carbon monoxide ~~(400 ppmvd at 3% $O_2$)~~, confirm that the final settings result in compliance with the regulatory limits. **If compliance with the emission limits specified in the unit's Permit to Operate is not**

**achievable, take~~s~~ actions and provide notification to the District pursuant to the requirements of Section ~~F~~G.4**.

6. RULE 361 TUNE-UP REPORT

When the above checks and adjustments have been made, prepare a *Rule 361 Tune-Up Report*. The report shall include all recorded data and combustion analysis data for the unit; the manufacturer, model number and serial number of the portable $NO_x$/CO analyzer; the name, title, signature, company name and contact information of person performing the tune-up; and date the tune-up was performed. The *Rule 361 Tune-Up Report* shall clearly indicate the "*Initial As-Found Conditions*" and the "*Final As-Tuned Conditions*" and shall (if applicable) state whether Section D.1 and D.3 emission standards for $NO_x$ and CO were met. Calibration records shall be submitted as part of the *Rule 361 Tune-Up Report*.

*NOTE*

The owner or operator may propose an alternative tuning procedure that meets the same basic requirements of the procedure outlined above for review and approval by the Control Officer. The District may assess fees to reimburse its costs associated with the review of the alternative procedure using either Section I.C~~.d~~ or Section III.C of Rule 210. Control Officer approval of the alternative tuning procedure must be obtained in writing prior to its use.

Resolution in the Matter of
Rule 361, Small Boilers, Steam Generators and Process Heaters,
and
Rule 342, Control of Oxides of Nitrogen (NOx) from Boilers,
Steam Generators and Process Heaters

# ATTACHMENT #F

# Proposed Rule 342

Proposed amended rule text is provided in strikeout and underlined format.
Strikeout indicates text proposed for deletion.
Underlined text indicates proposed new text.

**RULE 342.** ~~**CONTROL OF OXIDES OF NITROGEN ($NO_x$) FROM BOILERS, AND PROCESS HEATERS.**~~ **BOILERS, STEAM GENERATORS, AND PROCESS HEATERS (5 MMBtu/hr and greater)**

(Adopted 3/10/1992, revised 4/17/1997, 6/20/2019)

## A. Applicability

This rule shall apply~~ies~~ to any boiler~~s~~, steam generator~~s~~, or~~and~~ process heater~~s~~ with a rated heat input~~s~~ capacity greater than or equal to 5 million British thermal units per hour ~~used in all industrial, institutional, and commercial operations~~.

## B. Exemptions

1. This rule shall not apply to:

   a. ~~b~~Boilers used by public electric utilities to generate electricity.

   b. ~~p~~Process heaters, kilns, and furnaces, where the products of combustion come into direct contact with the material to be heated.

   c. ~~w~~Waste heat recovery boilers that are used to recover or augment heat from the exhaust of combustion turbines or reciprocating internal combustion engines.

   d. ~~e~~Equipment that does not require a permit under the provisions of Rule 202, Exemptions to Rule 201. Notwithstanding the above, this exemption shall not apply to any AB 617 Industrial Unit.

2. Section D.1~~.b~~, D.3, and D.5 shall not apply to any unit~~boilers~~ while forced to burn non-gaseous fuel during times of public utility imposed natural gas curtailment. This exemption shall not exceed 168 cumulative hours of operation per calendar year excluding equipment testing time not exceeding 24 hours per calendar year.

3. The emission limits of Section D.1, D.3, and D.5 shall not apply during startup and shutdown periods provided that all of the following conditions are met:

   a. Each startup and shutdown period shall not exceed two hours, unless otherwise allowed in a District Permit to Operate. In no case shall the startup period exceed 12 hours or the shutdown period exceed 9 hours, and

   b. Startup or shutdown intervals shall not last longer than is necessary to reach stable temperatures and conditions, and

   c. All emission control systems shall be in operation and emissions shall be minimized, to the extent possible, during startup and shutdown periods.

4. Section D.4 and Section K shall not apply to an emission unit that has implemented District Best Available Control Technology (BACT) due to a permit revision or a new permit issuance since 2007.

## C. Definitions

See Rule 102, Definitions, for definitions not limited to this rule. For the purposes of this rule, the following definitions shall apply:

**"AB 617 Industrial Unit"** means any unit located at a facility that, as of January 1, 2017, was subject to a market-based compliance mechanism adopted by the state board pursuant to Health and Safety Code §38562(c).

~~1.~~ **"Annual Heat Input"** means the total heat input of fuels burned by a unit in a calendar year, as determined from the higher heating value and cumulative annual usage of each fuel.

~~2.~~ **"Boiler or Steam Generator"** means any external combustion equipment fired with liquid and/or gaseous and/or solid fuel~~any fuel~~ that is used to produce ~~hot water or~~ steam or to heat water. Boiler or Steam Generator does not include any fired or unfired waste heat recovery boiler that is used to recover or augment heat from the exhaust of any combustion equipment.

**"Digester Gas"** means gas derived from the decomposition of organic matter in a digester.

**"Gaseous Fuel"** means any fuel which is a gas at standard conditions.

~~3. **Higher Heating Value (HHV)** means the total heat liberated per mass of fuel burned (Btu per pound), when fuel and dry air at standard conditions undergo complete combustion and all resultant products are brought to standard conditions.~~

**"Landfill Gas"** means gas derived from the decomposition of waste in a landfill.

**"Modification" or "Modify"** means any of the following actions:

1. Replacing a burner or burners on a unit; or

2. Removing a unit from the site of its original installation and installing it at a different location. A unit that is reinstalled within the same stationary source is not modified.

**"Non-gaseous Fuel"** means any fuel which is not a gas at standard conditions.

**"Parts Per Million" or "ppm"** means parts per million by volume expressed on a dry gas basis.

~~4.~~ **"Process Heater"** means any external combustion equipment fired with liquid and/or gaseous and/or solid fuel and which transfers heat from combustion gases to water or process streams. Process Heater does not include any kiln or oven used for drying, baking, curing, cooking, calcinating or vitrifying or any unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment.

~~5.~~ **"Rated Heat Input** ~~(million Btu per hour)~~**Capacity"** means the heat input capacity specified on the nameplate of the combustion unit, typically reported in million Btu per hour.~~-~~ If the combustion unit has been physically modified such that its maximum heat input is different than the heat input capacity specified on the nameplate, the modified maximum heat input shall be considered as the rated heat input. The new maximum heat input must be certified, in writing, by the manufacturer or installer and engineering calculations supporting the new maximum heat input rating must be submitted to and approved by the District. The District may require the modified maximum heat input capacity ~~shall~~to be demonstrated ~~to the District~~ by a fuel meter while operating the unit at maximum capacity.

**"Shutdown Period"** means the period of time during which a unit is taken from an operational to a non-operational status by allowing it to cool down from its operating temperature to a cold or ambient temperature as the fuel supply is turned off.

**"Startup Period"** means the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure.

~~6.~~ **"Unit"** means any boiler, steam generator, or process heater ~~as defined in 2 and 4 above~~.

**D. Requirements – Emission Standards**

1. For units that are installed prior to January 1, 2020 with a ~~rated heat inputs of greater than or equal to 5 million Btu per hour and~~ permitted annual heat input of greater than or equal to 9 billion British thermal units, oxides of nitrogen ($NO_x$) emissions shall not exceed the following limits~~evels~~:

   a. 30 parts per million ~~by volume (ppmv)~~ at 3 percent oxygen or 0.036 pounds per million British thermal units of heat input when operated on gaseous fuel~~.~~; and

   b. 40 parts per million ~~by volume~~ at 3 percent oxygen or 0.052 pounds per million British thermal units of heat input when operated on non-gaseous fuel~~.~~; and

   c. the heat-input weighted average of the limits specified in D.1.a~~.~~ and D.1.b~~., above,~~ when operated on combinations of gaseous and non-gaseous fuel.

   d. Emissions from units ~~subject to this section~~ shall not exceed a carbon monoxide (CO) concentration of 400 parts per million ~~by volume~~at 3 percent oxygen.

2. Units that are installed prior to January 1, 2020 with a ~~rated heat inputs of greater than or equal to 5 million Btu per hour and~~ permitted annual heat input~~s~~ of less than 9 billion British thermal units~~'s~~ shall be:

   a. operated in a manner that maintains stack-gas oxygen concentrations at less than 3.00 percent by volume on a dry basis; or

   b. operated with a stack-gas oxygen trim system set at 3.00 ±0.15 percent oxygen by volume on a dry basis; or

   c. tuned at least once every twelve months in accordance with the procedure described in Attachment 1; or

   d. operated in compliance with the applicable emission limits~~evels~~ specified in ~~Subsection~~ Section D.1.

3. On or after January 1, 2020, no owner or operator shall install or modify any unit unless the unit complies with the emission limits set forth in Table 1 below.

**Table 1: Emission Limits for Units Installed On or After January 1, 2020**

| Rated Heat Input (million Btu/hr) | Fuel Type | NOx Emission Limit (ppm at 3% $O_2$) | CO Emission Limit (ppm at 3% $O_2$) |
|---|---|---|---|
| 5 - 20 | Gaseous, except landfill or digester gas | 9 | 400 |
| > 20 | Gaseous, except landfill or digester gas | 7 | 400 |
| ≥ 5 | Landfill Gas | 25 | 400 |
| ≥ 5 | Digester Gas | 15 | 400 |

| | | | |
|---|---|---|---|
| ≥ 5 | Non-gaseous | 40 | 400 |
| ≥ 5 | Multiple Fuels | heat-input weighted average limit | 400 |

4. On or before December 31, 2023, all AB 617 Industrial Units that have an annual heat input of greater than or equal to 9 billion British thermal units shall operate in compliance with the emission limits specified in Section D.3.

5. In lieu of meeting the requirements of Section D.3, any boiler that directs the exhaust gases into a greenhouse as a means of supplementing carbon dioxide ($CO_2$) to a crop shall operate in compliance with the following emission limits:

   a. 30 parts per million oxides of nitrogen (NOx) at 3 percent oxygen; and

   b. 10 parts per million carbon monoxide (CO) at 3 percent oxygen.

**E. Requirements – Equipment**

1. Owners or operators of units which simultaneously fire combinations of different fuels~~,~~ and are subject to the requirements of ~~s~~Section D.1, D.3, or D.5 shall install totalizing mass or volumetric flow rate meters in each fuel line. Gas flow rate meters shall be installed in conjunction with temperature and pressure probes.

2. Owners or operators of units which employ flue-gas $NO_x$ reduction technology~~,~~ and are subject to the requirements of ~~s~~Section D.1, D.3, or D.5 shall install meters as applicable to allow instantaneous monitoring of the operational characteristics of the $NO_x$ reduction equipment.

3. ~~The use of~~On or after March 10, 1992, no person shall install an anhydrous ammonia system to meet the requirements of this rule ~~is prohibited~~.

**F. Requirements – Compliance Determination**

1. All emission determinations shall be made in the as-found operating condition, at the maximum attainable firing rate allowed by the District permit. No determination of compliance with the requirements of ~~s~~Section D.1, D.3, or D.5 shall be established during unit startup, shutdown, or under breakdown conditions. ~~within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer.~~ Compliance determinations shall be conducted at least 250 operating hours or at least thirty days after the tuning or servicing of the unit, unless it is an unscheduled repair.

2. All parts per million~~v~~ emission limits specified in ~~Subsection~~Section D.1, D.3, and D.5 are referenced at dry stack-gas conditions and 3.00 percent by volume stack-gas oxygen. Emission concentrations shall be corrected to 3.00 percent oxygen as follows:

$$[\text{ppm } NO_x]_{\text{corrected}} = \frac{20.95\% - 3.00\%}{20.95\% - [\%\, O_2]_{\text{measured}}} \text{ X } [\text{ppm } NO_x]_{\text{measured}}$$

$$[\text{ppm CO}]_{\text{corrected}} = \frac{20.95\% - 3.00\%}{20.95\% - [O_2]_{\text{measured}}} \text{ X } [\text{ppm CO}]_{\text{measured}}$$

3. All pounds-per-million-British thermal unit $NO_x$ emission rates shall be calculated as pounds of nitrogen dioxide per million British thermal unit of heat input.

4. All heat input weighted average NOx limits shall be calculated as follows:

$$\text{Weighted Limit} = \frac{(CL_A \times Q_A) + (CL_B \times Q_B)}{Q_A + Q_B}$$

Where: $CL_A$ = compliance limit for fuel A
$CL_B$ = compliance limit for fuel B
$Q_A$ = annual heat input from fuel A
$Q_B$ = annual heat input from fuel B

**G. Requirements – Source Testing**

1. ~~Except units complying with Subsection D.2.c, a~~All units subject to~~covered under Subsections~~Sections D.1, ~~and~~ D.2.a, D.2.b, D.2.d, ~~and~~ D.3, D.4, and D.5 shall be tested for compliance not less than once every 24 months.

2. The owner or operator of any unit subject to the source testing provisions of this rule shall submit a Source Test Plan to the District and obtain District written approval prior to the start of any source test. The Source Test Plan shall be filed with the District at least 30 days before the start of each source test. The District shall be notified of the date of source testing at least 14 days prior to testing to arrange a mutually agreeable test date.

3. Source testing shall be performed by a source test contractor certified by the California Air Resources Board. District required source testing shall not be performed by an owner or operator unless approved by the Control Officer.

~~2.~~4. The owner or operator of any unit which is found ~~not~~ to be in noncompliance with Section D as a result of a source test shall comply with the following:

a. A repeat source test shall be performed to demonstrate compliance with Section D within the time period specified by the District.

b. Annual source tests shall be conducted on any noncompliant unit until two consecutive tests demonstrate compliance with Section D. When the unit is demonstrated to be in compliance with Section D by two consecutive source tests, the unit shall comply with the provisions of Section G.1.

~~3.~~5. All source tests shall consist of a minimum of three 40 minute tests. The average concentration from the test runs shall be used for determining compliance.

**H. Test Methods**

1. The owner or operator of any unit subject to the source test requirements of this rule shall use the test methods and procedures listed below:~~Compliance with the $NO_x$ emission requirements and the stack gas carbon monoxide and oxygen requirements of section D shall be determined using the following test methods.~~

a. Oxides of Nitrogen - Environmental Protection Agency Method 7E or California Air Resources Board Method 100.

b. Carbon Monoxide - Environmental Protection Agency Method 10 or California Air Resources Board Method 100.

c. Stack Gas Oxygen - Environmental Protection Agency Method 3 or 3A or California Air Resources Board Method 100.

d. $NO_x$ Emission Rate (Heat Input Basis) - Environmental Protection Agency Methods 2 and 4 if applicable, or Method 19.

2. If certification of the ~~HHV~~Higher Heating Value is not provided by the third party fuel supplier, it shall be determined by one of the following test methods: ~~(1) ASTM D 2015-85 for solid fuels; (2) ASTM D 240-87 or ASTM D 2382-88 for liquid hydrocarbon fuels; or (3) ASTM D 1826-88, or ASTM D 1945-81 in conjunction with ASTM D 3588-89 for gaseous fuels.~~

a. For solid fuels: ASTM D5865-13 "Standard Method for Gross Calorific Value of Coal and Coke;"

b. For liquid hydrocarbon fuels: ASTM D240-17, "Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuel by the Bomb Calorimeter," or ASTM D4809-13 "Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method);" or

c. For gaseous fuels: ASTM D1826-94 (2010), "Standard Test Method for Calorific (Heating) Value of Gases in Natural Gas Range by Continuous Recording Calorimeter," or ASTM D1945-14, "Standard Test Method for Analysis of Natural Gas by Gas Chromatography," in conjunction with ASTM D3588-98 (2011), "Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels."

~~For numbers 1, 2, 3 and 4 above there shall be a minimum of three 40-minute tests with a strip chart recorder. For instrument methods, the maximum data reduction averaging interval is ten minutes, i.e. four or more intervals per test run. Compliance is determined via the arithmetic mean of the three runs.~~

**I. Requirements – Recordkeeping**

All owners or operators of units subject to this rule shall keep all records listed below onsite for a period of five years and the records shall be made readily available to the District upon request:

1. *Rule 342 Tune-Up Reports.*

2. Source test reports.

3. The cumulative annual fuel usage and the Higher Heating Value of each fuel used.

4. Records of emergency non-gaseous fuel use per Section B.2. These records shall include the dates, operating hours, and volumes of non-gaseous fuel used.

~~1. The owners or operators of units subject to Section D of this rule shall monitor and record for each unit the Higher Heating Value and cumulative annual usage of each fuel.~~

~~2. The owners and operators of units operating under the exemption of Section B.2 shall monitor and record for each unit the cumulative annual hours of operation on each nongaseous fuel. This data shall be updated monthly.~~

~~3. The owners and operators of units operated under the provisions of Section D.2.c shall maintain documentation verifying the required tune-ups.~~

~~4. The records required above shall be kept for three calendar years and shall be made available to the District on request.~~

**J. ~~Reporting~~ Requirements – Reporting**

~~The owners and operators of units subject to Sections D.1, D.2.a, D.2.b, and D.2.d shall submit compliance test reports on each unit for each fuel burned. Test reports shall include operational characteristics of all flue gas $NO_x$ reduction equipment or technology.~~

1. The records required pursuant to Section I.1, I.3, and I.4 shall be submitted to the District by March 1st for the prior calendar year.

2. Source test reports required pursuant to Section I.2 shall be submitted to the District within 45 days of test completion.

**K. Compliance Schedule – AB 617 Industrial Units**

~~The owner or operator of units subject to this rule shall:~~

~~1. Apply for a District Permit to Operate by June 8, 1992 in accordance with District Rule 202.~~

~~2. By March 10, 1994 submit a plan containing the following:~~

~~a. A list of all units with their rated heat inputs and permitted annual heat inputs.~~

~~b. For each unit listed, the selected method for meeting the applicable requirements.~~

~~3 By March 10, 1994 apply for an Authority to Construct for control equipment required to meet the standards of this Rule.~~

~~4. By March 10, 1996 demonstrate final compliance with this Rule.~~

1. The owner or operator of any AB 617 Industrial Unit that has a Permit to Operate shall apply for an Authority to Construct permit prior to January 30, 2023. This provision shall not apply to any unit that already meets the requirements in Section D.4, as listed in the unit's Permit to Operate.

2. The owner or operator of any AB 617 Industrial Unit that does not have a Permit to Operate shall submit a *Rule 342 Compliance Plan* for District review and approval prior to January 30, 2023 or 90 days prior to unit installation, whichever occurs earlier. All costs incurred by the District for the review and enforcement of the *Rule 342 Compliance Plan* shall be reimbursable costs pursuant to Section I.C of Rule 210, Fees. The *Rule 342 Compliance Plan* shall include:

   a. The company name, facility address, and facility contact information.

   b. A list of all subject units with their rated heat input capacity.

   c. Any proposed modifications to the unit so that the unit complies with the requirements in Section D.4 of this rule by December 31, 2023 and for the remaining life of the unit.

   d. For gaseous fuels, the proposed non-resettable temperature and pressure corrected totalizing fuel meter(s) specifications. For liquid fuels, the proposed non-resettable totalizing fuel meter(s) specifications. For solid fossil fuels, provide the methods of fuel throughput monitoring to be used that will achieve the same level of fuel monitoring accuracy as the meters required for the measurement of gaseous and liquid fuels described above. Include the fuel meter manufacturer, model number, technical brochure, and manufacturer recommended calibration schedule.

3. On or before December 31, 2023, the owner or operator of any AB 617 Industrial Unit shall operate in compliance with the requirements in Section D.4.

4. For AB 617 Industrial Units that are exempt from the requirements of Section D.4 on December 31, 2023 because they have an annual heat input of less than 9 billion British thermal units, but that subsequently no longer qualify for that exemption, the owner or operator shall submit an Authority to Construct permit application within 30 days of exceeding the threshold and shall operate in compliance with the requirements in Section D.4 within one year of exceeding the threshold.

ATTACHMENT 1

**SBCAPCD Rule 342 Tune-Up Procedures** ~~Equipment Tuning Procedure~~[1]

## PROCEDURE A
## Equipment Tuning Procedure for Forced Draft-Fired Equipment

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk ~~Insurors~~Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.

2. At this firing rate, record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number[2] (for liquid fuels), and observe flame conditions after unit operation stabilizes at the firing rate selected. Note these readings in the *Rule 342 Tune-Up Report* as the *"Initial As-Found Conditions."* If the excess oxygen in the stack is at the lower end of the range of typical minimum values[3], and if the CO emissions are low and there is no smoke, the unit is probably operating at near optimum efficiency ~~–~~at this particular firing rate. However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical.

3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the stack gas temperature, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.

4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this ~~L~~level, gradually reduce the combustion air flow~~,~~ in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.

5. Continue to reduce combustion air flow stepwise~~,~~ until one of these limits in reached:

    a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.

    b. Stack gas CO concentrations greater than 400 ppm.

    c. Smoking at the stack.

    d. Equipment-related limitations - such as low windbox/furnace pressure differential, built in air-flow limits, etc.

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1. This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for the EPA.

2. The smoke-spot number can be determined with ASTM Test Method D~~-~~2156~~-~~09 (2013), "Standard Test Method for Smoke Density Flue Gases from Burning Distillate Fuels," or with the Bacharach method. ~~ASTM Test Method D-2156 is included in a tuneup kit that can be purchased from the Bacharach Company.~~

3. Typical minimum oxygen levels for boilers at high firing rates are:

    1. For natural gas: 0.5% - 3%
    2. For liquid fuels: 2% - 4%

6. Develop an ~~02~~oxygen/CO curve (for gaseous fuels) or ~~02~~oxygen/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.

7. From the curves prepared in Step 6, find the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

| **Fuel** | **Measurement** | **Value** |
|---|---|---|
| Gaseous | CO Emissions | 400 ppm |
| #1 & #2 | smoke-spot number | number 1 |
| #4 oil | smoke-spot number | number 2 |
| #5 oil | smoke-spot number | number 3 |
| Other oils | smoke-spot number | number 4 |

The above conditions are referred to as the CO or smoke threshold, or as the minimum excess oxygen level.

Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.

8. Add 0.5 to 2.0 percent to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.

9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that rate.

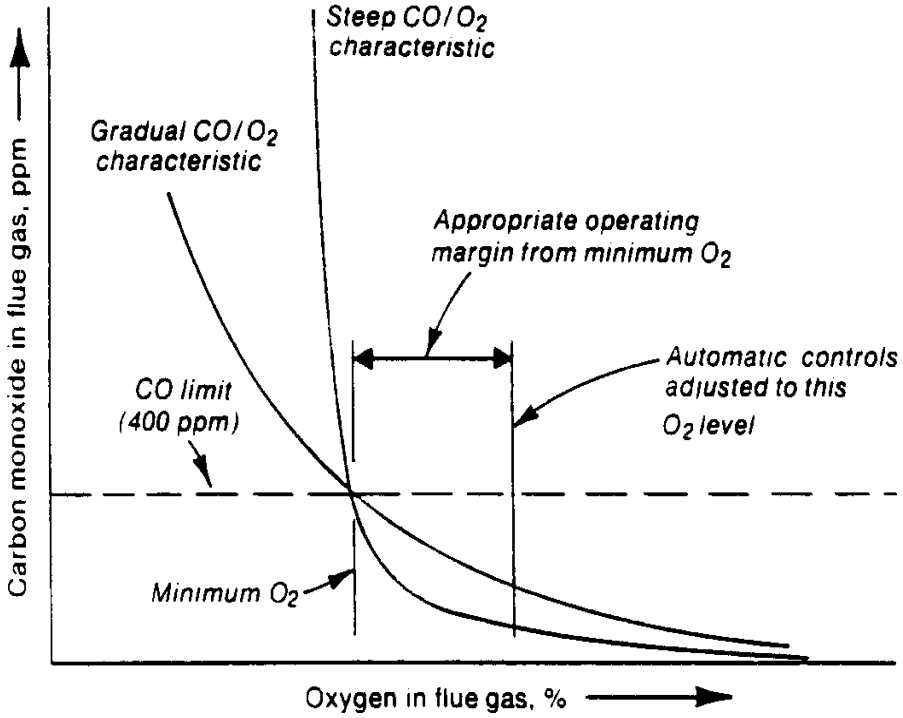
10. Verify that the new settings can accommodate the sudden changes that may occur- in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen at the affected firing rates. Next, verify these new settings in a similar fashion. Then make sure that the final control settings are recorded at steady-state operating conditions for future reference.

11. Take a final combustion analysis for carbon monoxide concentration and oxygen concentration (also record the smoke-spot number for liquid fuels only). Note these readings, as well as the stack temperature and flame condition, in the *Rule 342 Tune-Up Report* as the *"Final As-Tuned Conditions."*

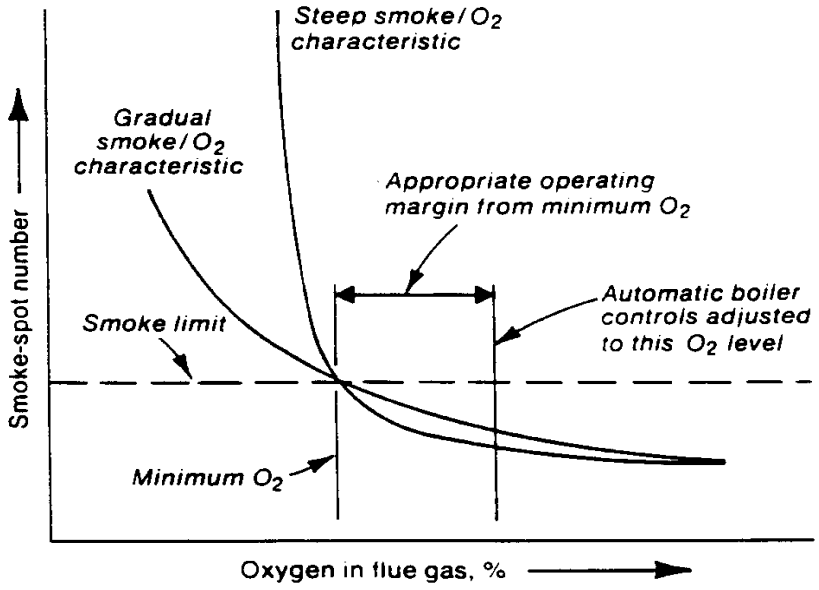
12. When the above checks and adjustments have been made, prepare a *Rule 342 Tune-Up Report*. The report shall include all recorded data and combustion analysis data for the unit; the name, title, signature, company name, and contact information of person performing the tune-up; and date the tune-up was performed. The *Rule 342 Tune-Up Report* shall clearly indicate the *"Initial As-Found Conditions"* and the *"Final As-Tuned Conditions"* and shall (if applicable) state whether the Carbon Monoxide emission standards were met.

*NOTE*
The owner/operator may propose an alternative tuning procedure that meets the same basic requirements of the procedure outlined above for District review and approval. The District may assess fees to reimburse its costs associated with the review of the alternative procedure using either Section I.C or Section III.C of Rule 210, Fees. District approval of the alternative tuning procedure must be obtained prior to its use.

**Figure 1**
Oxygen/CO Characteristic Curve




Oxygen/Smoke Characteristic Curve



**PROCEDURE B**
**Equipment Tuning Procedure for Natural Draft-Fired Equipment**

Nothing in this Equipment Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the California Department of Industrial Relations (Occupational Safety and Health Division) the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

1. PRELIMINARY ANALYSIS

a. Verify that the boiler, steam generator, or process heater (unit) is operating at the lowest pressure or temperature that will satisfy load demand. This pressure or temperature will be used as a basis for comparative combustion analysis before and after tune-up.

b. Verify that the unit operates for the minimum number of hours and days necessary to perform the work required.

c. Verify that the size of air supply openings is in compliance with applicable codes and regulations. Air supply openings must be fully open when the burner is firing and air flow must be unrestricted.

d. Verify that the vent is in good condition, properly sized and free from obstruction.

e. Perform an as-found (i.e., prior to any adjustments) combustion analysis for carbon monoxide concentration, oxygen concentration and measure the stack temperature and note the flame condition at both high and low fire, if possible. Note these readings in the *Rule 342 Tune-Up Report* as the *"Initial As-Found Conditions"*. Also record the following:

(1) Inlet fuel pressure at burner at high and low firing rates.

(2) Pressure above draft hood or barometric damper at high, medium, and low firing rates.

(3) Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the unit.

(4) Inlet fuel use rate if meter is available.

2. CHECKS AND CORRECTIONS

a. Clean all dirty burners or burner orifices. Verify that fuel filters and moisture traps are in place, clean, and operating properly. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Replace or repair all damaged or missing burner parts.

b. Remove external and internal sediment and scale from heating surfaces.

c. Verify that the necessary water or process fluid treatment is being used to minimize scale and corrosion. Confirm flushing and/or blowdown schedule.

d. Repair all leaks. In addition to the high-pressure lines, check the blow-off, drain, safety valve, bypass lines, and, if used, the feed pump.

3. SAFETY CHECKS

a. Test primary and secondary low water level controls.

b. Check operating and limit pressure and temperature controls.

c. Check pilot safety shut off operation.

d. Check safety valve pressure setting and verify that the setting is consistent with unit load requirements.

e. Check limit safety control and spill switch.

4. ADJUSTMENTS

Perform the following checks and adjustments on a warm unit at high fire:

a. Adjust unit to fire at the maximum inlet fuel use rate: record fuel manifold pressure.

b. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at high, medium, and low firing rates. The carbon monoxide value should not exceed 400 parts per million at 3% oxygen.

c. Verify that unit light-offs are smooth and safe. Perform a reduced fuel pressure test at both high and low firing rates in accordance with the manufacturer's instructions.

d. Check and adjust the modulation controller. Verify proper, efficient, and clean combustion through the range of firing rates.

When optimum performance has been achieved, record all data.

5. FINAL TEST

After adjustments, perform a final combustion analysis for carbon monoxide concentration, oxygen concentration, and measure the stack temperature and note the flame condition on the warm unit at high, medium, and low firing rates, if possible. Note these readings in the *Rule 342 Tune-Up Report* as the "*Final As-Tuned Conditions*". Also record the following:

i. Inlet fuel pressure at burner at high, medium, and low firing rates.

ii. Pressure above draft hood or barometric damper at high, medium, and low firing rates.

iii. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the unit.

iv. Inlet fuel use rate if meter is available.

*NOTE*
The owner or operator may propose an alternative tuning procedure that meets the same basic requirements of the procedure outlined above for review and approval by the Control Officer. The District may assess fees to reimburse its costs associated with the review of the alternative procedure using either Section I.C or Section III.C of Rule 210, Fees. Control Officer approval of the alternative tuning procedure must be obtained in writing prior to its use.