

## Attachment F

### List of Written Comments Rules 411 and 301

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Campbell Soup Company  
1 Campbell Place  
Camden, NJ 08103

November 22, 2004

Sacramento Metropolitan AQMD  
777 12<sup>th</sup> Street 3<sup>rd</sup> Floor  
Sacramento CA 95814  
Attn: Ali Mohamad

**RE: Amendments to AQMD Rule 411, NOx from Boilers, Process Heaters  
and Steam Generators**

Dear Mr. Mohamad:

Campbell Soup Supply Company, L.L.C. (CSSC) has reviewed the proposed amendments to Rule 411 and the staff report upon which the amendments were based. As a result of this review, it is Campbell's opinion that the staff report did not fully quantify the issues surrounding the proposed amendments. It is our contention, therefore, that proceeding with the proposed amendments at this time would be premature.

CSSC believes that the following issues need to be fully documented and incorporated into the final staff report:

- Please note that of the five agencies listed on page 3, only one has adopted 9-PPM Low NOx regulations on existing sources. Please update the staff report to have two charts; the first with those agencies regulating small units and the second with the single agency imposing a 9-PPM NOx emission level on existing sources. Listing all five agencies as imposing 9-PPM NOx emission levels misrepresents the current state of affairs within the California Air Districts.
- The Air District did not explore and discuss the reasoning to impose the proposed amendments in 2005, while the Federal Mandate referenced on page 3 of the Staff Report noted the need to meet the 8-hour Ozone standard by 2013. CSSC contends that there is sufficient time to witness and allow industry and SMAQMD to learn from the implementation of such a restriction by others in other air districts, so that costly pitfalls may be avoided and a sound approach to amendment implementation may be taken.
- Staff notes that the District met the evaluation of "All Feasible Measures" on page 4. CSSC believes that since Staff did not evaluate separately the impacts of regulating small NOx sources and imposing a 9-PPM NOx limit, all feasible measures were not evaluated.
- The staff report did not address the impact of imposing the new standards on new sources and modified sources requiring a new permit.

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- There are several flaws in the staff report's evaluation of the economic impacts with respect to "Best Available Retrofit Requirements." Specifically, CSSC takes exception to the assumption noted on page 15, regarding boilers with a "cost effectiveness above \$16/lb. Staff expects these sources to take an annual fuel usage limit". CSSC boilers are potentially such a source and cannot accept such a usage limit. CSSC believes that the District should contact the small population of sources in this category to correctly evaluate the economic impact of these regulations.
- The annualized costs of imposing the amendment did not include the additional operation and maintenance labor and fuel costs necessary to operate 9-PPM NOx boilers.
- The overall rule cost effectiveness is misleading. The above noted "assumption" must be properly addressed so that, at the very least, representative estimations may be obtained to take the place of the assumption in the cost effectiveness calculations. In addition, the amendments to the rules' economic impact must be evaluated by class or category to highlight the hardship being imposed on the large sources.
- The socioeconomic impact did not address the potential loss of employment and taxes that could result from the closure of businesses because of the new costs imposed by the rule. The district can request data from the small-regulated community to clarify these costs.
- The analysis of the availability and cost-effectiveness of alternatives to Rule 411 amendments did not address the various other sources of NOx within the air district and the feasibility and cost of reducing those other sources.
- The report notes that the staff has consulted with "boiler and burner manufacturers" and concluded that the technology is feasible. A glaring weakness in this analysis is the lack of input from the various source categories that are operating these devices. CSSC contends that the District, in its due diligence, must contact those sites that have been recently permitted and have had 9-PPM NOx limits imposed, via the BACT review process. CSSC is confident that a truthful and comprehensive review of these sites will clearly show that, while feasible, the technology developed thus far is nowhere near as reliable or conducive to normal boiler operation as the technology which is currently in use for achieving 30 PPM NOx emission levels.
- The single agency, SJVAQMD, that has imposed the 9-PPM regulation recognized the severe limitations of the 9-PPM technology, still in its infancy, and allowed load following boilers to be permitted at a much more reasonable 15-PPM NOx limit. There is no such consideration present in the proposed amendments to Rule 411.

Campbell Soup Supply Company believes that the flaws in the staff report must be addressed prior to finalizing the report and issuing the proposed amendments for comment. In addition, Campbell Soup Supply Company would like to assist in the organization of a work group of potentially affected sources, to provide the District with the proper data to complete a full evaluation of the proposed amendments.

We thank the District for this opportunity to voice our opinion and express our very serious concerns regarding the proposed amendments. We expect that many others in the regulated community share our concerns, and we look forward to having dialogues in the future with District Staff and representatives from other affected sources.

CAMPBELL SOUP COMPANY



Robert Zimmerman  
Environmental Program Manager

/lgm



P O Box 13222  
Sacramento CA 95813-6000

December 1, 2004  
L4948:cac

Ali Mohamad  
Sacramento Metropolitan Air Quality Management District  
777 12<sup>th</sup> Street, 3<sup>rd</sup> Floor  
Sacramento, CA 95814

Dear Mr. Mohamad:

Aerojet appreciates the opportunity to comment on the proposed amendments to Rule 411-Boiler NO<sub>x</sub>. Please consider the following comments when adopting the proposed rule.

Section 301 Aerojet feels the effective date of 12 months after date of rule adoption for retrofit is unreasonable. The schedule to retrofit in the original Rule 411 (affecting greater than 5 MMBtu/hr boilers) was two years. At that time Aerojet had 20 units to retrofit. With these proposed amendments, Aerojet and AFC could have up to 51 boilers to retrofit. The process to schedule funding as well as retrofit the boiler equipment could take several years.

Aerojet suggests that authority to construct applications for retrofit or low usage exemption be due 12 months after adoption of the rule. This will allow time to install fuel meters so we can evaluate whether low usage or retrofit is the best option. Following that we would appreciate a staggered schedule for installation allowing Aerojet and AFC together to retrofit about one per month for a total of five years phase in schedule. The source test should be performed within 6 months of startup of the unit.

This rule will incur significant cost for both Aerojet and AFC. Our combined Nox emissions from boilers has been approximately 15 tons/year since the original Rule 411 was adopted. The costs according to your numbers will be approximately \$3,000,000. We would like your consideration to minimize the cost impact where possible.

If you have any questions concerning these comments, please contact me at (916) 355-5715 or Anitra Brosseau at (916) 355-2950.

Very truly yours,

Carolyn A. Craig  
Environmental Health and Safety

## ALI MOHAMAD

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**From:** Lay, Jimmy F. [JFLAY@GAPAC.com]  
**Sent:** Thursday, December 02, 2004 9:17 AM  
**To:** ALI MOHAMAD  
**Cc:** Miller, Curtis K.; Kellogg, Ron L.; Simmons, Todd A.; Eckenrode, Jim P.  
**Subject:** Rule 411 Comment

Ali,

Thank you for inviting Georgia-Pacific to the rule workshop yesterday. Although I may have additional comments on the rule content after more careful review, I did see one obvious difficulty with the implementation schedule. After reviewing a draft schedule for the entire project, we do not see how a compliance plan can be completed within twelve months of implementation. I believe a 24 month period after implementation is more reasonable.

There are many aspects for getting into compliance, including retrofitting boilers, which would take budgeting, permitting, installation, testing, and reports. Getting through these processes in a twelve month period seems very difficult. If you wish to discuss the problems in more detail please call or email me, or I would be glad to attend a meeting.

Thanks,

Jimmy Lay  
Georgia-Pacific Corporation  
Sr. Environmental Engineer  
office 541-688-5221 cell 541-954-6737

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## ALI MOHAMAD

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**From:** Craig D. Thiry [cthiry@avogadrogroup.com]  
**Sent:** Friday, December 03, 2004 1:32 PM  
**To:** ALI MOHAMAD  
**Subject:** Rule 411 comments

Ali,

Per my comments at the workshop, I am reiterating my concerns on the source test section of the Rule (501.1).

In general, I believe the Air District and public benefits the most from testing the units in "as found" operating conditions (the way the units are normally operated when testing is not occurring). This would typically be in "automatic" load following conditions. Requiring testing at a load that the boiler never operates at forces people to tune the boiler to minimize emissions at that load point, which many times leads the boiler to increase emission concentrations where the boiler will operate the entire time when it is not being tested. This results in increased actual emissions for the air district. Many of these boilers WILL have varying emission concentrations at different load spots in the firing range, and the emission concentrations WILL also vary when the loads are changing verses when the boilers are held at one constant firing rate.

If you desire varying load information, San Joaquin Valley has some verbiage in Rule 4305/4306 you may want to take a look at. (they do 3 - 40 minute test runs in normal operating scenario with 5 minute test runs at certain load points dependent upon boiler operation). Then if the boiler is a "constant load" boiler, 3 - 40 minute test runs complete the work. The guidelines for these testing procedures are not in both rules - let me know if you need a copy of the supplemental guide they published a while ago.

For the heating boilers, you may have to force a load to get the required test time and/or allow multiple smaller test runs in order to capture the 120 minutes of data (e.g.. 6- 20 minute test runs,etc.). This should also be taken into consideration.

On another note - some other points brought up by people in the workshop - you may want to look at SJVAPCD guidelines for portable analyzers. The debate on source testing verses pre-certification for the 1-2 MMBtu/hr units may be addressed by requiring folks to show the emission concentrations after installation with a "certified" portable analyzer that has been calibrated with EPA protocol gases. This would eliminate the larger cost of a compliance source test but still provide the Air District with some confidence that the units are in compliance without worrying about the validity of "pre-certified" equipment. A boiler that passes in the factory by no means is guaranteed to pass once it is installed. Proper installation is absolutely critical for proper emissions, and that can only be verified in the field.

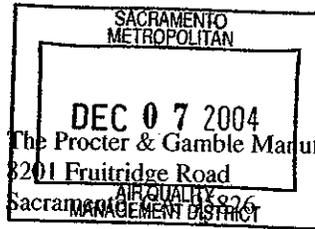
Ali, I did work for a boiler manufacturers rep for a few years so I have been on all 3 sides of this equation - I have worked for a business that operated a boiler, I have sold and installed the boilers, and I have been involved with thousands of boiler source tests in many air districts over many years and many different guidelines (seen what works and what doesn't). Please feel free to call me if I can be of any assistance.

Sincerely,

Craig Thiry  
The Avogadro Group, LLC  
(925) 680-9065

000106

# P&G



December 3, 2004

Mr. Ali Mohammad  
Sacramento Metropolitan AQMD  
777 12<sup>th</sup> Street, 3<sup>rd</sup> Floor  
Sacramento, CA 95814-1908

SUBJECT: COMMENTS ON DRAFT RULE 411 STAFF REPORT

Dear Mr. Mohammad,

Thank you for the opportunity to comment on the Draft Rule 411 Staff Report. Attachment D-2 of the Staff Report grossly understates the equipment and installation cost of \$117,000 (interpolated) for a 32-mmBtu/hr heater. In anticipation of the new Rule, we just completed a retrofit of our 32-mmBtu/hr Dowtherm heater with a burner capable of less than 9 ppm NO<sub>x</sub> with flue gas recirculation for a cost of \$380,000, or three times that cited. Furthermore, source tests for this unit run about \$2,000 per year. I believe these figures will significantly affect Staff's cost effectiveness calculations related to Rule 411.

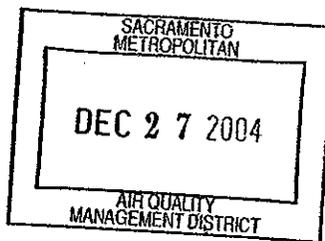
If you have any questions, please call me at 916-381-9842.

Sincerely,

A handwritten signature in cursive script that reads "Robert E. Randall Jr.".

Robert E. Randall Jr., PhD  
Environmental Manager

000107



Campbell Soup Company  
1 Campbell Place  
Camden, NJ 08103

December 21, 2004

Sacramento Metropolitan AQMD  
777 12<sup>th</sup> Street 3<sup>rd</sup> Floor  
Sacramento CA 95814  
Attn: Mr. Ali Mohamad

**RE: Campbell Soup Supply Company, L.L.C. Response to SMAQMD Request for Information, related to Rule 411 Proposed Amendments**

Dear Mr. Mohamad:

In response to your requests for information from Campbell Soup Supply Company's (CSSC's) Sacramento Plant, related to our estimated boiler/burner retrofit costs, the following budgetary estimate was provided by R.F. MacDonald Company. It has not yet been determined by CSSC that the provisions of this estimate are sufficient to meet the needs of the plant. These numbers are preliminary in nature and could change by more than 20%.

<b>Budgetary Estimate</b>	<b>- \$1,766,000</b>
<b>Budgetary Estimate per Boiler</b>	<b>- \$442,000</b>

As indicated in brief conversations between CSSC representatives and you following the Public Workshop held on December 1<sup>st</sup>, the following synopsis of the 20-year contractual agreement between SMUD and CSSC, along with a summary of CSSC's current operating requirements, is provided to allow the District to better understand why CSSC does not believe that taking a fuel usage exemption relative to the proposed language in the amendments to Rule 411 is a viable option:

- a. The 20 year Steam Sale and Boiler Lease Agreements between CSSC and SMUD, which began in March, 1998, provide for steam produced by either the Sacramento Power Authority (SPA) Cogen Plant or the CSSC boilers, to be sold by SPA to CSSC. The SPA has complete freedom of choice to use either source to produce the steam to be purchased by CSSC. Therefore, CSSC must retain the ability to produce the necessary steam.
- b. In the past 6 years of operation, the Cogen plant has been used to produce between approximately 85 and 95% of the steam purchased by CSSC. As experience in another CSSC facility, located in Paris, Texas, has shown, this could change tomorrow, next month, next year, in 10 years. If the SPA chooses, or is forced, however, to shut down the Cogen plant (i.e. for economic dispatch, if equipment casualty dictates) an even larger portion, or, possibly all, of CSSC's steam requirements would have to be met using the CSSC boilers. Notably, both of these

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types of events have occurred within the past 6 years of SPA Cogen plant operation. In addition to these events, the SPA Cogen plant averages one 4-6 week long outage, for turbine overhaul, approximately every 4 years.

- c. Based on annualized, average, daily steam flows, taking boiler efficiency into account, a fuel usage restriction of 200,000 therms per year, per boiler, would afford CSSC with the opportunity to run each boiler for only 7 days per year. On average, CSSC requires two boilers to be operated in parallel, each weekday, to support the manufacturing of product. In the best of circumstances, if fuel usage could be perfectly divided between all four of CSSC's boilers, this would only provide steam to the plant for 14 - 28 days, each year. The fuel usage restriction, listed in the proposed amendments to Rule 411, is not sufficient to allow CSSC the ability to cover the SPA's turbine overhaul outages, let alone the other, more significantly dire possibilities, listed above.

CSSC would like to suggest that the District explore splitting the proposed regulatory action into three phases, with implementation dates that follow completion of District Staff evaluation of the efficacy of the preceding phase. The first phase would be to expand the regulated sources to the desired minimum mmbtu/hr level. The second regulatory phase would lower the NOx emission level of all new sources and those sources that trigger a major permit revision. Then the District could evaluate and regulate the NOx emission level of existing sources. The approach noted above would allow the district to evaluate the need and impact of each phase independently. In addition, this approach would allow the technology required to comply with the proposed regulations to develop and become reliable.

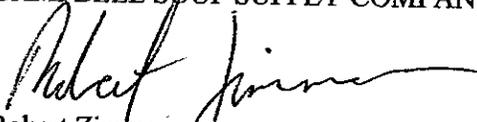
In addition to the points presented above, the following additional information is offered, both in support of CSSC's belief that forced implementation of the 9 PPM NOx limit is premature and to illustrate the potentially negative environmental and business impacts that such amendments could have.

- a. Off peak operation of our boilers requires 10-12 KLB/HR steam, to support 1 or 2 lines of production. As boiler firing rate gets low, it is not quite as stable as it is at higher load levels, while NOx levels start to increase exponentially. The existing boilers operate within the permitted limit because the burners are rated for 10:1 turn-down. The best 9 PPM NOx burners available, from Todd or Natcom, have, at best, a 6:1 turn down rating.
- b. Due to this severe limitation, of the new, yet to be fully developed 9 PPM NOx burner technology, CSSC would have to operate the boiler in full fired mode, to allow the burner to meet the emission rate and waste the excess steam. This mode of operation would actually result in a net increase in total emissions as well as the potential to generate noise pollution.

CSSC suggests that the District modify the amendments to rule Rule 411, to allow the use of the pilot flames of such burners, by themselves, at a NOx level higher than 9 PPM. If such a modification is not acceptable, then CSSC will be forced to either; 1) de-rate a boiler, significantly limiting our potential for future manufacturing expansion and economic growth in the area or, 2) install at least one new 50 - 60 mmbtu Low NOx boiler to allow us to sustain the low firing rate, without exceeding the 9 PPM NOx limit. The smaller of the two burner sizes installed in our boilers is currently rated at ~100 mmbtu.

In view of the information provided above, CSSC renews its offer, as stated in our letter of November 22<sup>nd</sup>, to assist the District in the organization of a work group of potentially affected sources to provide the District with the proper data to complete a full evaluation of the proposed amendments. We look forward to a speaking with you, regarding these matters, at your convenience.

CAMPBELL SOUP SUPPLY COMPANY, L.L.C.



Robert Zimmerman  
Environmental Program Manager

cc: R. Shober  
E. Perek  
C. Fisher  
J. Cheng  
J. Batura

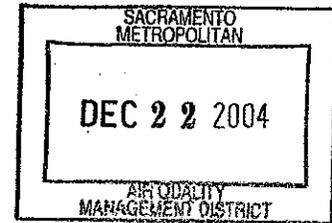
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# AEROJET FINE CHEMICALS

P O Box 1718  
Rancho Cordova, CA 95741

December 21, 2004  
AFC0456

Mr. Ali Mohamad  
Associate Air Quality Engineer  
Sacramento Metropolitan Air Quality Management District  
777 12<sup>th</sup> Street, 3<sup>rd</sup> Floor  
Sacramento, California 95814



**RE: Proposed Rule 411 - NOx from Boilers, Process Heaters and Steam Generators**

Dear Mr. Mohamad:

Aerojet Fine Chemicals LLC (AFC) appreciates the opportunity to review the proposed Rule 411 and offer the following comments to be considered in the final rule.

### **Effective Dates - Sections 113.2 and 301**

AFC respectfully request that the District consider extending the compliance schedule from twelve months after the date of adoption to 24 months or a schedule dependent on the number of affected units a facility will be required to evaluate and/or retrofit.

According to District estimates, AFC and Aerojet are facing considerable costs of approximately \$3,000,000 to retrofit 45 out of the 70 boilers onsite. A spreadsheet detailing the AFC and Aerojet boilers is attached for your review. These costs incur a financial burden not yet represented in any budget. In addition, AFC has estimated the potential cost for retrofitting the nine AFC boilers to be in the range of \$500,000 or \$150 per pound of NOx, which is extremely higher than what was calculated in the Staff Report. Some of these boilers may qualify for the low use criteria, but individual data and time is needed to make that determination.

In addition to financial concerns, AFC believes that the District has not considered the retrofitting process for facilities with multiple units. The process will include evaluating each boiler for usage. Most of the boilers do not have data to properly evaluate the usage of the individual boiler and meters will need to be installed on each boiler. The data should be collected and assessed up to a year. If the equipment needs to be retrofitted, there needs to be adequate time to scope and evaluate the low NOx options and choose the equipment that best fits each individual boiler unit, taking into consideration the size, make, model, and fuel and provides compliance with the rule. The emissions control equipment will need to be ordered, and AFC believes that this type of equipment will be in great demand and lead times may increase, exceeding the nominal six to eight weeks. The installation schedule will need to be formulated to not cause interference with production and allow adequate time for contractor and facility personnel schedules. It is not reasonable to retrofit 45 boilers in 52 weeks.

A longer compliance schedule will also prevent facilities from applying for Authority to Construct to incorporate the low usage requirements into the permit without supporting data. If

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the data after one year indicates that the unit does not fall under the low usage exemption, the facility will permanently lose the low-usage exemption completely without the ability to re-adjust or re-structure boiler use and take advantage of this exemption.

The option of the twenty-four month timeframe for facilities with few units will also be consistent with the schedule allowed in the previous Rule 411 amendments affecting units greater than 5 mmBtu/hr.

Therefore, AFC would like the District to consider extending the compliance schedule for facilities with multiple units to allow for adequate equipment evaluation and installation and lessen cost impacts.

Should you have any questions concerning these comments or require additional information, please contact me at (916) 355-3923.

Sincerely,



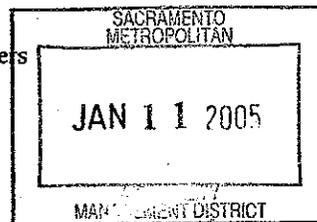
Jill C. Reed  
Environmental Manager  
Aerojet Fine Chemicals

Enclosures

000112



Blue Diamond Growers



January 10, 2005

Mr. Ali Mohamad  
Sacramento Metropolitan AQMD  
777 12th Street, 3rd Floor  
Sacramento, CA 95814

Re: Comments on Proposed Revisions to Rule 411

Dear Mr. Mohamad:

This letter reiterates comments made at the December 1, 2004, workshop regarding proposed changes to District Rule 411, "Boiler NOx." Blue Diamond is most concerned that the proposed rule revisions do not adequately address boilers firing landfill gas fuel. Also, the District should consider a phase-in schedule for facilities with multiple affected units and the District should provide more justification for its choice of a 200,000 therms/yr low fuel usage exemption and the 1 MMBtu/hr applicability cut off.

#### Landfill Gas

The most significant omission in the rule is the lack of provisions regarding boilers firing landfill gas. Based on our conversations with various burner vendors (Coen, R.F. MacDonald, and NATCOM), it has not been demonstrated that burners firing landfill gas can achieve 9 ppm NOx at 3% oxygen. Blue Diamond currently burns landfill gas in its Cleaver Brooks boiler, and would like the flexibility to burn this gas in its Nebraska boiler. If Blue Diamond does not burn this landfill gas as fuel for its boilers, the gas will be vented to flares at the landfill site resulting in higher NOx emissions, and Blue Diamond will have to combust natural gas in place of the landfill gas, resulting in more than double the current NOx emissions. Therefore, there is a significant environmental benefit to burning landfill gas in the Blue Diamond boilers.

We recommend that the rule be revised to include provisions for testing of landfill gas burners to determine if 9 ppm is feasible, or, alternatively, setting the landfill gas NOx limit based on demonstrated emission levels (approximately 15 ppm at 3% oxygen, according to vendors).

#### Phase-In

The District should include a provision for phase-in of compliance for facilities with multiple emissions units, similar to the revisions to Rule 4306 in the San Joaquin Valley APCD. It will be extremely difficult to retrofit multiple boilers within 12 months of rule adoption, especially when these boilers cannot be off simultaneously without presenting serious process disruptions.

Low Usage Exemption, Applicability Threshold

It is unclear from the Staff Report how the District arrived at the 200,000 therms/yr low usage exemption level for boilers larger than 5 MMBtu/hr. Rule 4306 in the San Joaquin Valley APCD has a 30 billion Btu/yr (300,000 therms/yr) low usage exemption. Also, the District should provide a better analysis of the cost effectiveness of requiring controls or fuel flow meters for boilers in the 1 to 2.5 MMBtu/hr range. The cost tables seem to indicate that it is equally cost effective to install meters or controls on these small boilers as it is for boilers in the 2.5 to 5 MMBtu/hr size range. Finally, the District should compare the cost effectiveness of these proposed rule revisions to other NOx rules it has adopted, rather than other VOC rules as indicated on page 13 of the staff report.

Thank you for your time and consideration in this matter. We hope that you will revise the draft rule and staff report to include provisions for landfill gas fuel, phase-in schedules for multiple affected units, and additional cost effectiveness data. If you have any questions about these comments, please feel free to contact me at (916) 325-2825.

Sincerely,

*Bob Hitomi*

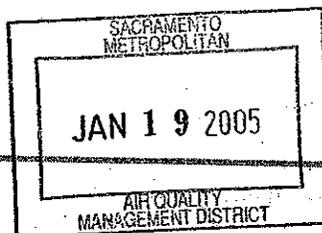
Bob Hitomi

*Joe Carlone*

Senior Industrial/Environmental Engineer

cc: Jeff Adkins, Sierra Research

*J carlone@bdgravers.com*



Air Products and Chemicals, Inc.  
7201 Hamilton Boulevard  
Allentown, PA 18195-1501  
Telephone (610) 481-4911

14 January 2005

Mr. Ali Mohamad  
Sacramento Metropolitan AQMD  
777 12<sup>th</sup> Street, 3<sup>rd</sup> Floor  
Sacramento, CA 95814

Subject: Comments on Proposed Amendments to Sacramento Metropolitan Air Quality Management District Rule 411 ("NOx from Boilers, Process Heaters, and Steam Generators")

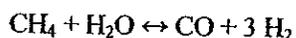
Dear Mr. Mohamad:

Air Products and Chemicals, Inc. ("APCI") is taking this opportunity to offer comments to the proposed amendments to Sacramento Metropolitan AQMD Rule 411 ("NOx from Boilers, Process Heaters, and Steam Generators"). As proposed, the amendments would require gaseous fired units with greater than 20 MMBtu/hr of heat input to control NOx emissions to less than 9 ppmvd (3% O<sub>2</sub>) within 12 months of rule adoption. However, certain types of fired units are exempted, including process heaters and furnaces where the products of combustion come into direct contact with the material to be heated.

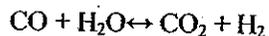
Air Products is particularly concerned about the impact of this rule on the two reforming furnaces we operate at our Sacramento hydrogen production facility. For the reasons set forth below, meeting the proposed NOx standard of 9 ppm is not technically feasible at any reasonable cost. We request that the District consider placing reformers in the exempt unit category or reconsider the NOx standard applicable to this type of combustion unit.

#### Hydrogen Production

APCI owns and operates two small hydrogen production plants at a single location in Sacramento. Both plants produce hydrogen by steam reforming of natural gas in two reforming furnaces. Please refer to the simplified process diagram in Figure 1. The process feed, natural gas, is compressed and mixed with steam before entering catalyst filled tubes located in a gas-fired reforming furnace where at high pressure and temperature the following reaction takes place:



The gas leaving the reformer tubes enters a series of catalytic reactors where additional hydrogen is produced by the water-gas shift reaction:



The next step is purification of hydrogen using the physical process of pressure-swing absorption where un-reacted CO, CO<sub>2</sub>, and CH<sub>4</sub> are removed along with some hydrogen and sent back to the reformer furnace as fuel ("purge gas")<sup>1</sup>. The now 99%+ pure hydrogen is sent to an adjacent customer and some is liquefied for distribution elsewhere by tank truck.

<sup>1</sup> Purge gas is somewhat similar to a low Btu refinery fuel gas (see typical analysis given in Figure 1).

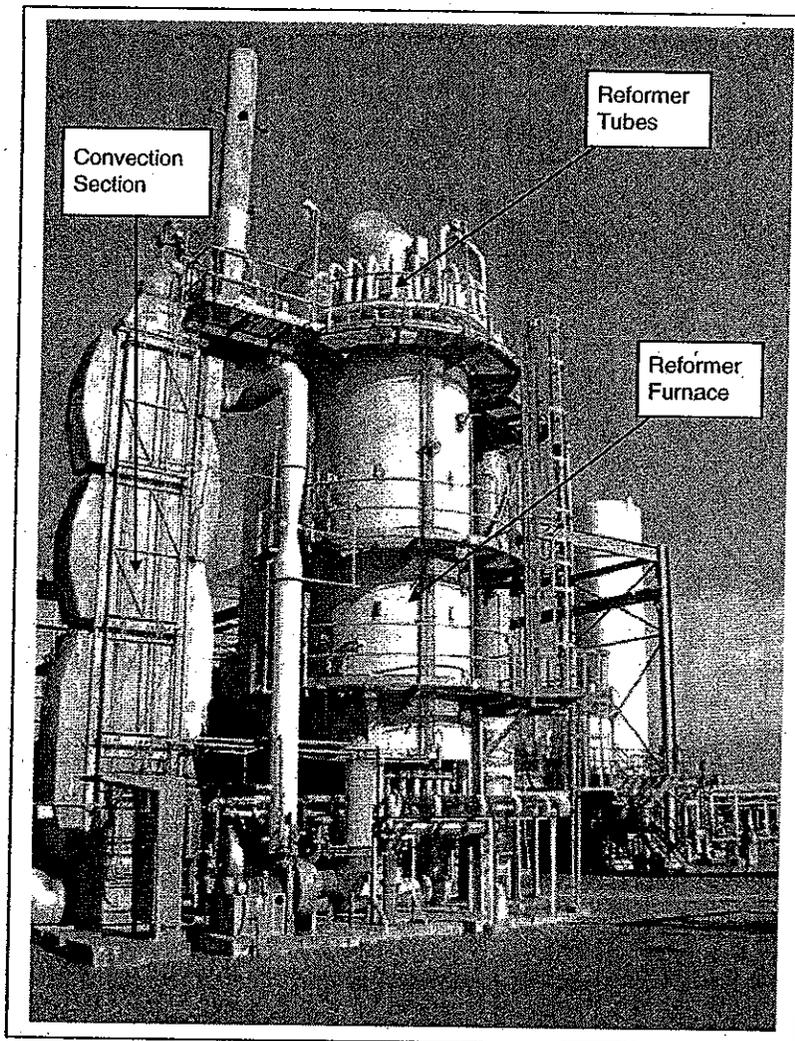
### NOx Emissions at the Sacramento Facility

The two hydrogen plant reformer furnaces, A plant shown right (B is similar), fire purge gas with natural gas as the balance of the fuel. Purge gas accounts for more than 80% of the heat input to the furnaces on a calorific basis. A-plant came onstream 3/86 and B-plant, 6/89.

Each plant's furnace contains 3 up-fired burners surrounded by catalyst filled reformer tubes (A-26 tubes, B-32 tubes). In the convection section heat is recovered by generating process steam and preheating combustion air.

A-plant's furnace nameplate burner capacity is 19.1 MMBtu/hr but operates at about 25 MMBtu/hr, while B-plant's burners are nominally rated at 37 MMBtu/hr but operates at roughly 33 MMBtu/hr.

A and B NOx emissions average 22 ppm and 30 ppmvd respectively corrected to 3% O<sub>2</sub>; equivalent to 0.7 and 1.2 lb./hr of NOx, or about 8 tons/year total.



### Best Available Retrofit Technology (BARCT)

In its examination of technical feasibility of various retrofit technologies, the District naturally focused on the largest group of gas-fired units, namely boilers. The implicit conclusion of the staff report was that it was feasible, for the most part, to retrofit boilers with ultra low NOx burners ("ULNB"); or, in some cases, it was cost effective to replace the entire boiler to achieve 9 ppm NOx (3% O<sub>2</sub>).

However, a reformer furnace is not a boiler. It is essentially a direct fired chemical reactor. It differs from a conventional natural gas-fired boiler in the following significant ways:

- The furnace must operate at the much higher temperatures needed for the reforming reaction to take place efficiently. Typically flue gas leaving the furnace's radiant section is 1900 to 2000°F while for a small package boiler temperatures will be hundreds of degrees less.<sup>2</sup>
- Combustion air pre-heat temperatures for the reformers is very high, 500 to 900°F, while package boiler's have much lower air preheat, if any.
- The reformers use multiple burners leading to higher peak flame temperature.
- The fuels are very different. The furnaces' heat input is primarily from "purge gas" containing mostly H<sub>2</sub> and CO<sub>2</sub> while most package boilers fire natural gas; mostly methane. The burners in the furnace must be able to simultaneously fire both purge gas (~80% of the total heat input on a Btu basis); and some natural gas (< 20% of the heat input), which acts as a trim fuel.
- Reforming furnaces are very costly compared to boilers of the same size. Rough costs for the reformers at Sacramento are \$10,000,000 each.

Because of the high temperatures involved and the multiple fuel requirements, it is much more difficult to use combustion controls in a reformer furnace to reach very low NOx levels. Attachment 1 is a presentation prepared by Technip, a major vendor of reformer furnaces, which examines retrofitting furnaces with ultra-low-NOx burners. Referring to page 5 of the presentation, three ULNB burners are listed with their potential NOx performance in a process furnace. NOx levels are from 20-25 ppm (3% O<sub>2</sub>).

Attachment 2, from John Zink, describes some burners in service somewhat similar to the Sacramento furnaces (multiple burners/multiple fuels/high air pre-heat). NOx levels of 20 ppm are claimed, but the exact operating conditions aren't stated.

Attachment 3 contains a September 2004 SCAQMD "white paper" that on page 17 concludes that for refinery boilers and process heaters, "Ultra low NOx burners are only capable of reducing NOx levels to approximately 25 ppm due to the size and design of the equipment and the combustion characteristics of refinery gas."

Lastly, Air Products has some recent (2004) field experience with three new reforming furnaces using ultra-low-NOx burners<sup>3</sup>. These furnaces are considerably larger (200+ MMBtu/hr heat input) than either of Sacramento's furnaces. At the first plant, NOx test results varied between 20 and 22 ppmv (3% O<sub>2</sub>); at the second, results were 27 to 31 ppmv NOx (3% O<sub>2</sub>); and at the third, 22 ppm (3% O<sub>2</sub>).

Based on these three references and APCI's recent field experience, ULNB applied to reformer furnaces may be able to achieve NOx levels of 25 ppm reliably but not 9 ppm. To achieve lower levels, post-combustion control, will be necessary.

### Selective Catalytic Reduction

SCR is a technically feasible method of meeting 9 ppmv for the furnaces, but we believe at a prohibitive cost. Estimating SCR cost without carefully considering the specific details of retrofitting an SCR unit at the Sacramento plant introduces a great deal of uncertainty in any cost estimate. However, a quick review of readily available information suggests the installed cost of an SCR alone for the A plant would be roughly \$370,000 while for B, it would be \$490,000. In the AQMD staff report, retrofit capital costs are

<sup>2</sup> Typically combustion temperatures must be at least 300 to 400°F above the process temperature. In the case of the reformer the process temperature is around 1600°F while for a small industrial boiler producing 125 psig saturated steam, the process temperature is only 350°F.

<sup>3</sup> One plant was equipped with burners from Callidus Technologies, another with John Zink burners, and the last used an APCI designed burner.

said to be \$280,000 for a 31.5 MMBtu/hr boiler. This heat release rate is about the same as that of the Sacramento reformers. Though the District cost may be a bit low, given the uncertainty in the information immediately available, the capital cost of \$280,000 for SCR on a 31.5 MMBtu/hr unit is used in the following incremental cost analysis for adding SCR to the Sacramento reforming furnaces (see Table 1). In addition to the SCR cost, after discussing the units with our process engineers, additional ID fan capacity will be needed to overcome increased pressure drop from the SCR beds and additional duct work. New fans and motors add about \$100,000 in the retrofit cost to each furnace. However, no cost estimate is included for what we believe will be significant modification to the convection sections of each furnace.

The cost of capital is taken as 7% and the remaining contract life of the plant, 10 years, is used to amortize the investment. The operating costs included are for aqueous ammonia consumption, additional power to overcome the increased pressure drop, emission testing, and District fees.

Summarized from Table 1 are the costs, \$/lb of NOx control, to achieve 9 ppmvd with starting points of 30 ppmvd, 25 ppmvd, and 20 ppmvd.

Baseline NOx	Furnace A (\$/lb)	Furnace B (\$/lb)
30 ppmv (3% O <sub>2</sub> )	\$18.13	\$15.78
25 "	\$23.77	\$20.68
20 "	\$34.53	\$30.03

Relative to the incremental costs considered in the staff report, the cost to meet the proposed standard for reformers is very high. By inference from the report, costs above \$16.00/lb are not currently considered to be reasonable. South Coast AQMD also comes to this conclusion in its "white paper" as it states, "SCR was determined to be cost effective for refinery boilers/heaters rated at greater than 110 MMBtu/hr, but not for the 40 to 110 MMBtu/hr units", and states further, "No new BARCT was set for units between 40 and 110 mmBtu/hr since SCR is not cost effective based on 25 ppm, the level achievable with ultra low NOx burners."

Because it is technically not feasible for ULNB to achieve much better than 30 ppm and SCR is currently cost prohibitive; we believe that reformer furnaces should be in the exempt category of Rule 411 (i.e., new section 111) as are other high temperature combustion processes.

We appreciate your consideration of our comments and would be happy to provide you any additional information that might be of help as you review them.

Very truly yours,



Tom Hess  
Environmental Engineering  
[hesstc@apci.com](mailto:hesstc@apci.com)  
610-481-7620

000118

**ALI MOHAMAD**

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**From:** James, Jim [Jim.JamesEnvironmental@weyerhaeuser.com]  
**Sent:** Monday, January 17, 2005 4:48 PM  
**To:** ALI MOHAMAD  
**Cc:** Grimes, Scott; Risner, Gary  
**Subject:** 011505\_Rule 411 Comments.doc

Mr. Mohamad: Here is the letter we discussed. You will notice I chose to include my concern about the possibility the burner manufacturers may not meet their dates. I realize the District has a variance procedure, but if there is something in addition that could be done within the rule, I thought it worth mentioning. I will be calling to follow-up further. Thank you very much for your help with my understanding of the Rule and for the opportunity to submit comments. Jim James

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P. O. Box 9777  
Federal Way, WA 98063-9777  
(253) 924-3619  
(253) 924-2013  
jim.jamesenvironmental@weyerhaeuser.com

January 14, 2005  
Ali Mohamad  
Associate Air Quality Engineer  
Sacramento Metropolitan AQMD  
777 12<sup>th</sup> Street, 3<sup>rd</sup> Floor  
Sacramento, CA 95814-1908

Dear Mr. Mohamad:

**Subject: Comments on Proposed Amendments to Rule 411**

The purpose of this letter is to respond to the District's invitation to comment on the proposed amendments to Rule 411. These comments will address: rule interpretation; compliance costs; and more general implementation and policy matters.

Weyerhaeuser Company owns and operates a corrugated container manufacturing facility at 10268 Waterman Road, Elk Grove, California. The 350hp process steam boiler and two space heaters (> 1MMBTU/hr input each) would be subject to the amended Rule as currently proposed. Two external air make-up units (> 1MMBTU/hr input each) appear to be properly exempted from the rule.

Rule 411 Applicability

Outside make-up air is heated and introduced into the building using 2 direct-fired (gas) units; each is larger than the 1MMBTU/hr threshold. It is not clear that bringing these units into

compliance with the proposed limits is technically feasible at a manageable cost. The District's retention of the exemption cited in the rule under "General", at paragraph 111- EXEMPTION-PROCESS HEATERS, FURNACES AND KILNS is important to facility staff. They will continue to apply this exemption to these two air make-up units.

The two air heaters/movers located inside the plant are indirectly fired and currently have low NOx burners in service. The manufacturer reports they are designed to meet the proposed limit and are therefore considered compliant at this time with the proposed rule amendments.

If the Agency should be considering some method of compliance demonstration for space heaters, the starting point should be the manufacturers. They logically should be the source of the most data to support any performance claims.

Furthermore, assuming a facility can demonstrate that it operates and maintains the units in conformance with the manufacturer's specifications, and then the units should be deemed in compliance with the rule.

The reason is simple: cost/benefit. Reduction of NOx in these units is minimal and any cost exacerbates the financial effect of the rule on these few, small manufacturing facilities.

#### Cost/Benefit Comments

The District's estimate of approximately \$93,000 to comply with the rule coincides with a preliminary vendor estimate to retrofit the Elk Grove boiler. Current boiler emissions are below the present 30ppm limit for NOx based on test data confirming the manufacturer's claims at installation.

At the rated firing rate, 14.65MMBTU/hr heat input, and at the as tested emission rate of 18.7 ppm NOx, the boiler would emit approximately 1.44 ton/yr, assuming 365 operating days. By reducing the threshold to 15ppm (and assuming 12ppm actual for example), the emission drops to 0.93 tons/yr for a difference of 0.51tons/yr, according to data provided by the equipment vendor.

Of course, the boiler does not operate 365 days per year, nor does it operate at full capacity routinely. The average production rate is closer to 30%.

Under the best of conditions, the removal of NOx is minimal, perhaps a few hundred pounds per year, for a very large expenditure. A brief review of the Agency's DCF calculation methodology does seem to acknowledge the costs in some cases are quite high.

On the other hand, there seems to be some costs that are not adequately recognized with the current methods.

For example, the District apparently introduced the current NOx limits in 1997. For those facilities that had to retrofit at that time, was there an allowance, or consideration, in the cost impact analysis for the lost capital represented by disposing of burner equipment still operating years within its planned service life? Would the previous cost analysis have been done over a 15 year life and if so, is there some way for those who made the expenditure in good faith to recover losses?

While the DCF cost impact methodology used appears to be commonly employed in these

**000120**

evaluations, it does not seem to take into account the real and immediate financial burden on production facilities in the year the expense is incurred. In the highly competitive global markets in which many facilities operate, it is just not realistic to pass this type compliance cost directly to the customer. As a result, there are potential practical consequences that may be missed and that may only surface much later.

#### General Comments

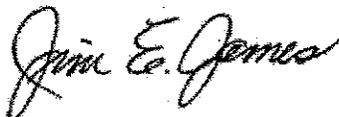
Weyerhaeuser Company has experience with the implementation of Rule 4306 in the San Joaquin at its Modesto facility. As required by the District, an "Application To Construct" was submitted

with the requisite retrofit schedule in a timely manner. However, the burner manufacturer has been unable to meet their production schedules, despite assurances at the beginning there would be no problems. Several facilities within the District are experiencing delays at this time.

The Sacramento Air District staff is encouraged to clearly outline the procedures available to those clients requiring boiler modifications who, through no fault of their own, are unable to meet the deadlines in the rule. Weyerhaeuser Company's policies do not allow for operating in a non-compliant mode, regardless of the cause. If the equipment is not available to install in time to meet the deadlines, then clients like Weyerhaeuser will need timely legal relief to avoid having to stop operating until the facility can again operate in compliance.

Thank you for this opportunity to comment on the proposed amendments to Rule 411. If you have any questions or comments, please contact me any time.

Regards,



Jim E. James  
Area Environmental Manager

cc: Gary Risner – EC2-2C1  
Scott Grimes – Portland

000121

10/10/2005



14700 Downey Avenue  
 P.O. Box 1418  
 Paramount, CA 90723  
 (562) 531-2060



February 2, 2005

Ali Mohamad  
 Sacramento Metropolitan  
 Air Quality Management District  
 777 12<sup>th</sup> Street, 3<sup>rd</sup> Floor  
 Sacramento, CA 95814-1908

**RE: Rule 411 Boiler Rule Comments**

Dear Mr. Mohamad:

I appreciated the opportunity to speak with you regarding the modifications to proposed amended rule (PAR) 411 on January 19, 2005. As we discussed, Paramount's Elk Grove facility has six affected units between 5 mmBtu/hr and 20 mmBtu/hr heat input as described in the staff report for PAR 411. All of the units have already been retrofitted with low NO<sub>x</sub> burners in recent years at a significant cost (i.e. approximately \$500,000) to meet the current requirements of Rule 411. The slight NO<sub>x</sub> reduction achieved to meet the proposed 15 ppm is estimated to cost an additional \$500,000. Therefore, Paramount requests an exemption to PAR 411 for its Elk Grove facility on the basis of cost effectiveness.

Four of the units are heaters, two of which are multi-burner. The other two units are boilers. Paramount has permit limits of either 30 ppm or 20 ppm NO<sub>x</sub> on each of the units (see attached permits). In addition to cost effectiveness, several air districts consider the useful life of a unit to be up to 15 years before additional controls or lower limits are required. Paramount is requesting that you consider this in your evaluation of the applicability of our units.

Although December 2003 source testing demonstrates that some of the units operate below their respective NO<sub>x</sub> permit limit and near the proposed 15 ppm limit, the boiler manufacturer will not guarantee the new limit unless new burners are installed. The source test report is attached for your review. The table below lists the current equipment permit limits.

Equipment	Rating (MMBtu/hr)	NO <sub>x</sub> Permit Limit (ppm)	12/2003 NO <sub>x</sub> Average Level (ppm)
CB Boiler	14.3	20	14.9
Rooney Heater #1	7.9	20	15.3
Rooney Heater #2	7.9	20	16.4
Broach Heater #1	13	30	24.2
Broach Heater #2	13	30	19.1
Kewanee Boiler	13.6	30	23.6

*off set*

*7/1/05*

In December 2004, we contacted R.F. MacDonald to provide us with an estimate of capital costs to retrofit our units to meet 15 ppm. The cost originally provided to us included new burners, O<sub>2</sub> trim, and variable speed drives (VFD) and was estimated to be \$750,000. Recently, R.F. MacDonald stated that O<sub>2</sub> trim and VFDs would not be needed. Even with the elimination of these costly items, the estimated total capital cost to retrofit all six units to meet 15 ppm is \$464,000 as represented in the table below. This is based on replacing the burners in the six units, adding new non-resettable gas meters and source testing. The average unit cost is still over \$77,000 per unit.

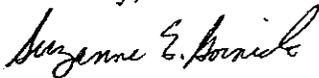
Equipment	NO <sub>x</sub> Reduced (tons)	Capital Cost (\$)	Cost Effectiveness (\$/ton)
CB Boiler	0.382	\$74,000	\$193,683.10
Rooney Heater #1	0.211	\$74,000	\$350,590.94
Rooney Heater #2	0.211	\$74,000	\$350,590.94
Broach Heater #1	1.042	\$84,000	\$80,614.05
Broach Heater #2	1.042	\$84,000	\$80,614.05
Kewanee Boiler	1.090	\$74,000	\$67,884.03

The cost to retrofit all of the units significantly exceeds SMAQMD's cost effectiveness threshold of \$32,000 per ton of NO<sub>x</sub> reduced. This is because the quantity of NO<sub>x</sub> reduction is relatively small given that low NO<sub>x</sub> equipment retrofits have already been made. The incremental NO<sub>x</sub> reduction to achieve 15 ppm from either 20 ppm or 30 ppm ranges from 0.211 tons to 1.09 tons. The range of cost effectiveness dollars varies from a minimum of \$67,884 to a maximum of \$350,591.

Paramount requests an exemption from PAR 411 revised NO<sub>x</sub> limit of 15 ppm because additional retrofits of Paramount's affected units are not cost effective. Therefore, Paramount would appreciate the opportunity to meet with you to discuss qualification for an exemption based on exceedance of the current SMAQMD cost effectiveness criteria.

Please contact me at your convenience to discuss this issue. My phone number is (562) 531-2060 x2706.

Sincerely,



Suzanne E. Gornick

File EG.100.100

**ALI MOHAMAD**

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**From:** sgornick@ppcla.com  
**Sent:** Tuesday, February 08, 2005 1:44 PM  
**To:** ALI MOHAMAD  
**Subject:** Paramount Petroleum Elk Grove Facility

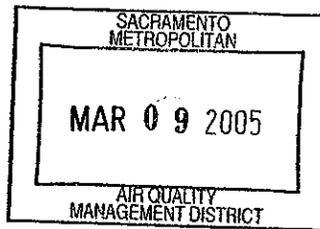
Ali,  
Attached is the updated cost effectiveness calculation for Paramount's Elk grove Facility. As we discussed, I calculated the cost effectiveness using a 15 year useful life and 7% interest. I was not able to confirm the previous NOx limits for the retrofits completed in the late 1990's so I did not include this data. Two of the units, the Rooney heaters, are above the District's cost effectiveness threshold of 32,000 \$/ton. Therefore, Paramount is requesting exemption for those two units.

As you mentioned in our telephone call earlier, please email information regarding emissions offsets. Are you still considering allowing facilities with multiple units a several year compliance schedule to offset high capital costs?

Sue Gornick  
Senior Environmental Engineer  
Paramount Petroleum  
Phone: (562) 531-2060 x2706  
Fax: (562) 529-8061

000124

10/10/2005



March 7, 2005

Ali Mohamad  
Sacramento Metropolitan Air Quality Management District  
777 12<sup>th</sup> Street, Third Floor  
Sacramento, CA 98514-1908

Dear Mr. Mohamad,

I've been talking with Dave Deckman, Impact Sciences, and Carla Jo, SMAQMD, about Rule 411 because it sounds like it could have an impact on our process when the rule changes.

**Background:**

Grafil Inc. uses a thermal oxidizer to thermally treat the exhaust gases coming from an electrically-heated furnace. This year we are up-grading the process line and consequently purchasing a new low NOx incinerator. The low NOx incinerator uses steam in order to get the low NOx profile. Instead of buying a new natural gas heated boiler we decided use the waste heat generated by the incinerator to make the steam.

Also, although we are using a low NOx incinerator, the combustion of natural gas in the incinerator is not the primary source of NOx in our exhaust. The waste gas from the furnace contains nitrogen compounds, which form additional NOx when combusted. As you are probably aware, the boiler rules were originally intended to control NOx generated by fuel combustion in boilers and similar equipment and not to regulate emission control devices.

It has been brought to my attention that Rule 411 may apply to the Incinerator and Waste Heat Boiler in combination calling the two together a boiler.

We had decided to purchase the Waste Heat Recovery Boiler because it is the best environmentally friendly way to make steam for the incinerator. We need the thermal oxidizer to treat the off gases of our process whether or not we use a waste heat boiler in conjunction with it. I am concerned that we are going to be penalized for using the best available technology for lowering NOx to the atmosphere.

Please take our type of situation into consideration when making the rule changes.

Sincerely,

Renée Kunz  
Manufacturing Technology Manager  
Grafil Inc.

5900 88th Street  
Sacramento, CA  
95828, USA  
Tel: 916.386.1733  
Fax: 916.383.7668  
Web: www.grafil.com

000125



**ALI MOHAMAD**

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**From:** Dave Deckman [daved@impactsociences.com]  
**Sent:** Thursday, March 10, 2005 1:17 PM  
**To:** ALI MOHAMAD  
**Cc:** Renee Kunz  
**Subject:** Rule 411

Ali,

I was reviewing a recent "MACT standard" (National Emission Standard for Hazardous Air Pollutants) for industrial, commercial, and institutional boilers. You might be interested to note the definition of "boiler" in this regulation.

"Boiler means an enclosed device using controlled flame combustion and having the primary purpose of recovering thermal energy in the form of steam or hot water. Waste heat boilers are excluded from this definition."

The regulation also includes a definition of a waste heat boiler:

"Waste heat boiler means a device that recovers normally unused energy and converts it to usable heat. Waste heat boilers incorporating duct or supplemental burners that are designed to supply 50 percent or more of the total rated heat input capacity of the waste heat boiler are not considered waste heat boilers, but are considered boilers. Waste heat boilers are also referred to as heat recovery steam generators."

The MACT standard is not applicable to waste heat boilers.

As we have discussed, the proposed waste heat boiler at the Grafil facility will not be fired with supplemental fuel. I am just passing along this information for the District's consideration for the proposed revision of Rule 411.

David Deckman  
Impact Sciences

000126

10/10/2005

## ALI MOHAMAD

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**From:** robert\_zimmerman@campbellsoup.com  
**Sent:** Wednesday, April 13, 2005 10:45 AM  
**To:** charles\_fisher@campbellsoup.com; ALI MOHAMAD  
**Cc:** ed\_perek@campbellsoup.com; james\_cheng@campbellsoup.com;  
robert\_shober@campbellsoup.com; john\_batura@campbellsoup.com  
**Subject:** Re: BOILER NOX REDUCTION - RULE 411 AMENDMENT

I have contacted Mr. Ali Mohamad of the Sacramento Metropolitan Air Quality Management District to discuss the proposed board hearing. Mr. Mohamad stated that he will issue to Campbell Soup Company a response to each issue raised in our November 22, 2004 and December 21, 2004 letters to the District. In addition, Mr. Mohamad stated that a revised Staff Report and a new Rule 411 Amendment will be submitted for review next week that incorporates multiple changes in response to the comments received.

Upon review of the documents next week a meeting can be scheduled with the District to discuss the new Staff Report and proposed Rule 411 Amendment.

During our phone conversation Mr. Mohamad continued to express an opinion that CSC could lower our expected cost of compliance by limiting the steam producing capability of our boilers. Therefore, we will have to provide a written explanation, with financial implications, to convince Mr. Mohamad that the facility must have the ability to operate all boilers at the present permitted capacity. Chuck or John, can you provide a draft explanation which can then be reviewed by the group?

Mr. Mohamad has been copied on this e-mail so that he is aware of our interest in this issue and desire to help the district craft regulations that achieve the improvement of local air quality without unnecessarily harming local industry.

Robert Zimmerman  
Environmental Project Manager

Charles  
Fisher/US/CAMPSOU  
P/CSC

04/11/2005 05:08  
PM

To  
Robert  
Zimmerman/US/CAMPSOUP/CSC@CSC  
cc  
Robert Shober/US/CAMPSOUP/CSC@CSC,  
Ed Perek/US/CAMPSOUP/CSC@CSC, James  
Cheng/US/CAMPSOUP/CSC@CSC  
Subject  
BOILER NOX REDUCTION - RULE 411  
AMENDMENT

Bob,

We just received the Spring edition of Air Lines, the Sac Metro AQMD publication of the current events within the air district that affects the local community. In this edition,

there is a small article about a "Tentative Board Hearing scheduled for May 26, 2005" to approve the proposed amendments to Rule 411 reducing allowable boiler NOx emissions.

We still have not received a written response from the AQMD to our letter dated 12-21-2004.

Chuck Fisher  
Environmental Coordinator / Project Engineer Campbell Soup Supply Co - Sacramento, CA  
Tel: (916) 395-5137  
Fax: (916) 395-5156

\*\*\*\*\*  
This e-mail and any files transmitted with it may contain confidential information and is intended solely for use by the individual to whom it is addressed. If you received this e-mail in error, please notify the sender, do not disclose its contents to others and delete it from your system.  
\*\*\*\*\*

**ALI MOHAMAD**

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**From:** Eggleston, Don [Don.Eggleston@dgs.ca.gov]  
**Sent:** Wednesday, September 21, 2005 8:53 AM  
**To:** ALI MOHAMAD  
**Subject:** RE: Rule 411, NOx from Boilers, Process Heater, and Steam Generators Proposed Amendments

Hello Ali,

Thanks for the notice on rule 411. For what it is worth, OSP has no problem with it, and will not submit any comments.  
DGE

-----Original Message-----

**From:** ALI MOHAMAD [mailto:AMOHAMAD@airquality.org]  
**Sent:** Monday, September 19, 2005 9:52 AM  
**To:** Balazs, Rick; Zegarski, Bob; charles\_fisher@campbellsoup.com; Craig D. Thiry; Dave Deckman; Debbie Sprock; Dennis Gregor; Eggleston, Don; Moulton, Donna - PM Realty; Greg Kendrick; Greg Schnable; Hegeman Jacob; JChristman@ppcla.com; Piotrowski, Jerry; James, Jim; Lay, Jimmy F.; Linden. Ron (MSA); Lisa Davis; Lou Brizzolara; Manuel Salinas; Mark Beaty; Mimi Sen; MTomas@coen.com; Paris Rivera; Richard Williams; robert\_zimmerman@campbellsoup.com; Rowe, Greg; sgornick@ppcla.com; Steve Brown; Teresa Aronson; Thaniel Davis; Hess,Thomas C.; Simmons, Todd A.; Tony Simoni; Johnston, William; Williams, Tom (DGS)  
**Cc:** ALI MOHAMAD  
**Subject:** Rule 411, NOx from Boilers, Process Heater, and Steam Generators Proposed Amendments

Enclosed are copies of Rule 301, Permit Fees - Stationary Source, Rule 411, NOx from Boilers, Process Heaters, and Steam Generators, and the associated Staff Report. The District is amending Rule 411 to set new NOx emission standards applicable to boilers and process heaters rated at or above 1 mmBtu/hr input. Rule 301 amendments are to specify the fees applicable to small boilers rated below 5 mmBtu/hr input.

A public workshop was held in December 2004 to discuss the proposed changes to these rules. The District made changes to Rule 411 and the staff report to address the comments that were received during and after the public workshop. The District is planning to take these rules before the District's Board for adoption on October 27, 2005. Please review these rules and provide me with comments by this coming Friday, September 23, 2005. If you like to meet with the District to discuss these changes or your specific concerns, please feel free to contact me at (916) 874-4850.

Sincerely,

Ali Mohamad  
Associate Air Quality Engineer  
Sacramento Metropolitan Air Quality Management District

**Note:**

If you get two e-mails, please ignore one of them because you may be listed on two District contact lists.

Enclosures

000129

10/10/2005

- Rule 411, NOx from Boilers, Process Heaters and Steam Generators
- Rule 301, Permit Fees - Stationary Sources
- Staff Report, Rules 301 and 411

<<RULE301 boiler draft rv2.doc>> <<STAFRPTrule411rv25.doc>> <<RULE411rv25.doc>>

**000130**

**ALI MOHAMAD**

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**From:** Joe Carlone [JCarlone@bdgrowers.com]  
**Sent:** Thursday, September 22, 2005 3:17 PM  
**To:** ALI MOHAMAD  
**Subject:** RE: Rule 411

Thank you for addressing our concerns. We should be able to comply with the changes.

-----Original Message-----

**From:** ALI MOHAMAD [mailto:AMOHAMAD@airquality.org]  
**Sent:** Tuesday, September 20, 2005 10:05 AM  
**To:** Joe Carlone  
**Subject:** Rule 411

Enclosed are copies of Rule 301, Permit Fees - Stationary Source, Rule 411, NOx from Boilers, Process Heaters, and Steam Generators, and the associated Staff Report. The District is amending Rule 411 to set new NOx emission standards applicable to boilers and process heaters rated at or above 1 mmBtu/hr input. Rule 301 amendments are to specify the fees applicable to small boilers rated below 5 mmBtu/hr input.

A public workshop was held in December 2004 to discuss the proposed changes to these rules. The District made changes to Rule 411 and the staff report to address the comments that were received during and after the public workshop. The District is planning to take these rules before the District's Board for adoption on October 27, 2005. Please review these rules and provide me with comments by this coming Friday, September 23, 2005. If you like to meet with the District to discuss these changes or your specific concerns, please feel free to contact me at (916) 874-4850.

Sincerely,

Ali Mohamad  
Associate Air Quality Engineer  
Sacramento Metropolitan Air Quality Management District

Enclosures

- Rule 411, NOx from Boilers, Process Heaters and Steam Generators
- Rule 301, Permit Fees - Stationary Sources
- Staff Report, Rules 301 and 411

<<RULE301 boiler draft rv3.doc>> <<STAFRPTrule411rv25.doc>> <<RULE411rv25.doc>>

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10/10/2005

## ALI MOHAMAD

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**From:** charles\_fisher@campbellsoup.com  
**Sent:** Thursday, September 22, 2005 2:58 PM  
**To:** ALI MOHAMAD  
**Cc:** ed\_perek@campbellsoup.com; james\_cheng@campbellsoup.com; robert\_zimmerman@campbellsoup.com; john\_batura@campbellsoup.com; KEVIN J. WILLIAMS  
**Subject:** CAMPBELL SOUP SUPPLY CO COMMENTS TO PROPOSED RULE 411 AMENDMENTS

Mr. Mohamad:

After a review of the proposed changes to the amendments to Rule 411 and the Staff Report, Campbell Soup Supply Company (CSSC) respectfully submits the following comments, in the form of requests, related to Rule 411:

1. That the language in the definition for "Load Following Unit" be changed, by the addition of the phrase in blue font, to read as shown below.

211 LOAD FOLLOWING UNIT: A unit with normal operational load fluctuations and requirements, imposed by fluctuations in the process(es) served by the unit, which exceed the operational response range of an Ultra-Low NOx burner system(s) operating at 9 ppmv NOx. The operator shall designate load-following units on the Permit to Operate.

It is CSSC's considered opinion that our boilers are, in fact, Load Following Units, in accordance with this definition.

2. That the following exemption be added, to the proposed changes to the amendments to Rule 411, as the District sees fit, to address CSSC's and others' fully anticipated requirement, to utilize a "Standing Pilot Burner" arrangement, to meet steam production requirements, in situations where steam demand is considerably less than that which can be provided by the current Ultra-Low NOx burner system technology's turn-down capability.

Exemption: In the case of Load Following Units, at times during which demand imposed by fluctuations in the process(es) served is lower than the operational response range of an Ultra-Low NOx burner system(s) necessitating that a Standing Pilot Burner or similar arrangement be utilized to serve the process, the NOx limit in Section 301 shall not apply.

In conversations with an RF MacDonald Co. representative, it was learned that such a "Standing Pilot Burner" arrangement was determined to be necessary, for a boiler owned and operated by Hershey's, in Oakdale, CA.

Additionally and, most significantly, this arrangement was approved by the San Joaquin Valley Unified APCD.

We look forward to hearing from the District, after their review and consideration of this matter.

Chuck Fisher  
Environmental Coordinator / Project Engineer Campbell Soup Supply Co - Sacramento, CA  
Tel: (916) 395-5137  
Fax: (916) 395-5156

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**ALI MOHAMAD**

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**From:** Zegarski, Bob [bob.zegarski@intel.com]  
**Sent:** Thursday, September 22, 2005 2:00 PM  
**To:** ALI MOHAMAD  
**Subject:** Boiler Retrofit Question

Ali,

Appreciate your time in this morning's telecom and your assistance in answering the questions generated against the proposed changes to Rule 411. Another question surfaced that I would like to run by you.

What actually constitutes a boiler retrofit that would require submittal of an application towards a potential modification to the permit to operate?

1. Functional replacement in kind of the entire boiler? Yes.
2. Replacement of the burner assembly? Yes.
3. Replacement of expendable hardware found defective during preventative maintenance? Assume No.
4. Installation of emission controls and/or O2 trim systems that do not change the NOx or CO emissions under the permitted conditions? Not sure.
5. Others?

Any assistance would be greatly appreciated.

Regards,  
Bob

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10/10/2005

**ALI MOHAMAD**

**From:** Hess, Thomas C. [HESSTC@airproducts.com]  
**Sent:** Thursday, September 22, 2005 1:21 PM  
**To:** ALI MOHAMAD  
**Cc:** Thompson, Gerard P.; Henninger, Jeffrey L.; Cargile, Race C.; White, Robert A.; Solodar, Todd E.  
**Subject:** Air Products Updated Comments to Rule 411

Dear Mr. Mohamad:

I apologize, but as I reread the draft revision to 411 a couple of minor editorial suggestions came to mind that might make the rule a little clearer in the following areas:

With regard to applicability I'd suggest that "reformers" be added specifically to the list to be consistent with the inclusion of the definition of a reformer at section 218 (definitions):

**102 APPLICABILITY:** The requirements of this Rule shall apply to units (i.e., boilers, steam generators, reformers, and process heaters) fired on gaseous or nongaseous fuels with a rated heat input capacity of ~~5~~ 1 million Btu per hour or greater, used in industrial, institutional, and commercial operations.

Here is the definition of reformer I suggested in my e-mail this morning:

**218 REFORMER:** A furnace in which a hydrocarbon feedstock is reacted with steam over a catalyst at high temperature to form hydrogen and lesser amounts of carbon monoxide and carbon dioxide.

Finally, because reformer furnace is new term in the revised rule, you may want to consider removing the reference to reformer limits in the table for 1997.

**301 BARCT Limits**

Unit Size/Description

MmBtu/hr Input Effective

May 31, 1997 Effective

(See Section 407)  
NOx Limits

ppmvd@3% O2 CO

Limits

ppmvd@3%O2 NOx

Limits

ppmvd@3%O2 CO Limits

ppmvd@3%O2

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Greater than or equal to 1 and less than 5	-	-	30	400
Greater than or equal to 5 and less than or equal to 20	30	400	15	400
Greater than 20	30	400	9	400
Gas Fired Reformer Furnaces	-----		30	400
Greater than or equal to 5 and fired on landfill gas or a combination of landfill gas and natural gas	30	400		
	15	400		
Load Following Units greater than or equal to 5 mmBtu/hr input	30	400	15	400

Again, many thanks for your time.

Best regards,

Tom Hess  
610-481-7620

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10/10/2005

**ALI MOHAMAD**

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**From:** Hess, Thomas C. [HESSTC@airproducts.com]  
**Sent:** Thursday, September 22, 2005 7:07 AM  
**To:** ALI MOHAMAD  
**Cc:** Cargile, Race C.; White, Robert A.; Thompson, Gerard P.  
**Subject:** Sacramento Hydrogen Plant, Rule 411 Comment

Dear Mr. Mohamad:

Thank you for sending the revised draft Rule 411. My only comment regards the definition of the term reformer. In the draft rule the following definition is given:

218 REFORMER: A system that performs gasification via a low-temp steam reforming chemical reaction. The reforming reaction is conducted between liquid hydrocarbons and steam over a catalyst bed to form methane, hydrogen and carbon oxides.

The following better defines the reformers used at hydrogen production facilities such as ours in Sacramento:

**REFORMER: A furnace in which a hydrocarbon feedstock is reacted with steam over a catalyst at high temperature to form hydrogen and lesser amounts of carbon monoxide and carbon dioxide.**

Thanks again for your consideration.

Best regards,

Tom Hess  
610-481-7620

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10/10/2005

**ALI MOHAMAD**

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**From:** Sue Gornick [sgornick@ppcla.com]  
**Sent:** Friday, September 23, 2005 10:46 AM  
**To:** ALI MOHAMAD  
**Cc:** June Christman  
**Subject:** Comments on the Staff Report

Ali,  
Because the two 7.9 mmBtu/hour heaters are already limited to 20 ppm, even though the annualized cost is \$8,124.80/yr, the cost effectiveness still exceeds the District's \$32,000 \$/ton. Paramount's cost effectiveness is over \$38,000 \$/ton. However, page 17 of the staff report does not reflect cost effectiveness in \$/ton. Will you be providing exemptions for units above the cost effectiveness?

Thanks,

Sue Gornick  
Senior Environmental Engineer  
Paramount Petroleum  
Phone: (562) 531-2060 x2706  
Fax: (562) 529-8061

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10/10/2005

**ALI MOHAMAD**

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**From:** Linden. Ron (MSA) [lindenr@SacCounty.NET]  
**Sent:** Tuesday, September 27, 2005 11:57 AM  
**To:** ALI MOHAMAD  
**Cc:** BRIGETTE TOLLSTRUP; Donahue. Michael (MSA); kgwilliams@airquality.org  
**Subject:** Meeting on Proposed New Blr Rule 411

Dear Ali and Brigette,

(Note: Ali, if I got Brigette's e-mail address wrong in the cc-list, please forward to her).

We appreciate the opportunity to meet with you on Wednesday 9/28 at 2 PM to present our concerns about the new blr Rule.

For the record, I did my best to contact you Ali prior to the Friday 9/23 date suggested in your e-mail for our comments (two phone messages left on 9/22 and 9/23 and an e-mail on 9/23) to request a meeting. Furthermore, your e-mail with the announcement was sent to me as late as 9/19 and not read by me until 9/21. This left an unacceptably short time to review and comment two days later. Especially in an organization like ours where people in different sections need to be involved in the process. But we assume that we can still present our concerns since we are within the public notice period, the announced purpose of which is to invite comments from all parties up until the Board meeting on October 27.

At our meeting on Wednesday (9/28) I and Mike Donahue will present our concerns in detail and soon thereafter submit our official response. In preparation for the meeting I enclose with this e-mail a **spreadsheet showing the performance of our boilers** that has been compiled by Mike Donahue and operations staff with some comments below.

When I and Mike met with you and Alita last year on this subject and you indicated that there would be an exemption threshold of 200,000 therms/yr per boiler, it appeared that we would be able to meet such a condition without being forced into doing further retrofit or replace the boilers. After additional review and in light of subsequent developments we now have second thoughts about this. I might add that when your previous boiler retrofit Rule (BARCT) was adopted it changed our boiler permit condition from a NOx emission factor of 0.060 lbs/mmBTU to the present 0.0364 lbs/mmBTU and a lowering of the NOx emission concentration to 30 ppmvd (@ 3% O2). With this approximately 50% emission reduction it forced us to embark on a large boiler retrofit contract. Through this retrofit we were able even better than the new requirement.

The attached spreadsheet shows the results from the last 5 annual source tests (by amendment to the blr rule we now have to perform annual source tests). As can be seen from the spreadsheet our present performance for NOx is much below the present limit (30 ppmvd). As a matter of fact, when the fuel is digester gas (called Sludge Gas or SG in our SRWTP terminology) the average (multiyear) performance is **11.19 ppmvd (@ 3% O2)** and 0.0138 lbs/mmBTU. These actual emission numbers only 37% and 38% respectively of what we are allowed in the permit limits (30 ppmvd and 0.0364 lbs/mmBTU). Sludge gas in our main fuel. Per annual reporting submitted to you under condition 20 of P/O 16048 you can see that sludge gas was used 94% of the time and natural gas only 6% of the time. Furthermore, when the boilers are used during a Carson outage (see discussion below) the sludge gas will be the exclusive fuel of choice. We provide this information so that you will have an appreciation for why we believe any additional retrofit is not cost-effective. As a public agency we can always find the financial resources to do what you require. However, we trust that both our Districts are interested in spending taxpayers money wisely. **Therefore, the fact that we are already so close to the new proposed NOx limit (9 ppmvd) plus the fact that we have such a low usage factor (see discussion below) both cry out for making sure that your proposed exemption levels will cover us at all times. Our concern is that presently it may not.**

It is apparent that under the new proposed Rule 411, overall economics for retrofit/replacement is the driving force. We are pleased that the exemption thresholds are generally tied to the boiler usage factor. However, to us there seems to be large variations in usage factor within a boiler range. For example, in the size range (5 to

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99.99 mmBTU/hr) of our own boilers (38 mmBTU/hr) the boiler usage factor (qualifying for the exemption threshold) ranges from 0.457 (45.7%) for a 5 mmBTU/hr boiler) down to 0.023 ( 2.3%) for a 99 mmBTU/hr boiler. Then if the boiler size goes just 1% above the 99 and reaches 100 mmBTU/hr, the permissible usage factor (to qualify for the exemption threshold) suddenly becomes 0.034 (3.4%) or almost 50% higher. Such a jagged curve (when plotting qualifying usage factor against boiler size) seems to be improper. A formula could easily be written that would yield a straight line on such a curve.

The basic rationale (from an "equity" point of view) would be to make such a straight line (when plotting exempted usage factors against boiler size) a horizontal line. However, an argument can be made to make the straight line slope downwards to allow higher usage factors for smaller boiler sizes since "the cost of retrofit per unit NOx emission saved" is higher for smaller boiler sizes.

The proposed "exemption usage factor" in the proposed Boiler Rule should also consider another equally important cost-effectiveness aspect. Boilers, like our own, that are already very close to meeting the new standard get very little "bang for the buck" when installing retrofits or being replaced. **While there is still a single boiler within your District that operate close to the present 30 ppmvd level (at 3% O2) and is allowed an exemption usage factor as high as over 0.40 (40%) - as will still be the case under the proposed Rule - it does not make sense to force boilers like ours at 11.19 ppmdv to be replaced or retrofitted (if the usage factor were to exceed 0.06 or 6%) in order to come below the new 9 ppmvd level.**

Our concern is rooted in the fact that when the Carson Cogen plant has a shut-down (whether it is scheduled maintenance and replacement or inadvertent outage) we will have to start up our boilers to meet the thermal load of the SRWTP. Then it will not be long before we reach the exemption threshold and will be in violation of the permit. With Carson Cogen plant coming of age, it is to be expected that maintenance and operational problems will increase. Additional consideration of these and similar aspects - like potential problems on our side with the steam transfer system - has caused us to reconsider the impact of the proposed new Rule. At the same time it is not to be expected that major outages - at either SRWTP or Carson Cogen - will occur frequently or even on an annual basis. To that end, if a **multiyear approach to the exemption level threshold** could be part of the new Rule, it would go a long way to ameliorate our concerns. In other words: instead of making the 200,000 therms/yr a limit for each year, let the exemption level threshold be **an average of 200,000 therms over the last 5 years.**

These are the topics we would like to discuss with you on Wednesday.

Sincerely

Ron Linden

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10/10/2005

**Attachment G**

**Evidence of Public Notice**

**THE DAILY RECORDER**

~ SINCE 1911 ~

901 H ST STE 312, SACRAMENTO, CA 95814  
Telephone (916) 444-2355 / Fax (916) 444-0636

Ali Mohamad  
SAC. METRO AIR QUALITY MGMT DIS  
777 12TH ST., THIRD FLOOR  
SACRAMENTO, CA - 95814

**PROOF OF PUBLICATION**

(2015.5 C.C.P.)

State of California )  
County of SACRAMENTO ) ss

Notice Type: HRG - NOTICE OF HEARING

Ad Description: Rule 411

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE DAILY RECORDER, a newspaper published in the English language in the city of SACRAMENTO, county of SACRAMENTO, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SACRAMENTO, State of California, under date 05/02/1913, Case No. 10038. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

09/26/2005

Executed on: 10/14/2005  
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.



Signature

This space for filing stamp only

SC #: 870802

**NOTICE OF PUBLIC HEARING  
SACRAMENTO METROPOLITAN  
AIR QUALITY MANAGEMENT  
DISTRICT  
COUNTY OF SACRAMENTO**

The Board of Directors of the Sacramento Metropolitan Air Quality Management District (District) will conduct a public hearing on October 27, 2005 at 9:30 A.M. in Room 1450 (Board of Supervisors' Chamber), County Administration Building, 700 H Street, Sacramento, California.

The District Board will consider the adoption of the proposed amendments to Rule 411, NOx from Boilers, Process Heaters, and Steam Generators and Rule 301, Permit Fees - Stationary Sources.

Rule 411 applies to new and existing units (e.g., boilers, steam generators, process heaters). The proposed amendments to Rule 411 will:

1. Lower rule applicability from 5 million Btu per hour (mmBtu/hr) input to 1 mmBtu/hr input.
2. Set a 30 parts per million NOx emission standard for new and existing units rated between 1 mmBtu/hr and less than 5 mmBtu/hr input. The NOx emission standard for these units can be verified by either performing an emissions source test or by using an approved portable analyzer.
3. Lower the NOx emission limits for new and existing units rated at or above 5 mmBtu/hr input, and
4. Establish exemptions from new and revised NOx emission limits for existing units with low annual fuel usage.

Rule 301 amendments are intended to clarify the fee requirements applicable to small units subject to Rule 411.

Rule 411 was created in response to the requirement of the Federal Clean Air Act Amendments of 1990 that the District submit NOx Reasonably Available Control Technology (RACT) rules for stationary sources. Rule 411 also fulfilled the requirement of Health and Safety Code section 40919(a)(3) that required the District to implement Best Available Retrofit Control Technology (BARCT) for all existing permitted stationary sources.

Copies of this notice, rule, and staff report will be posted on the District's website at [www.airquality.org](http://www.airquality.org) and may be downloaded. Hard copies of the rule and the staff report can be provided upon request (916) 874-4800.

By this notice, all interested parties are specifically requested to testify on the adoption of the proposed amendments to Rules 301 and 411. Oral and written testimony may be directed to the Board of Directors at the public hearing on October 27, 2005, or to the Sacramento Metropolitan Air Quality Management District, 777 12<sup>th</sup> Street, 3<sup>rd</sup> Floor, Sacramento, CA 95814, ATTENTION: Ali Mohamad (916) 874-4850.

09/26/2005

SC-870802#

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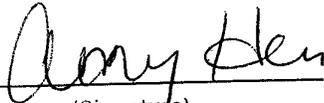
DECLARATION OF PUBLICATION  
(C.C.P. 2015.5)

COUNTY OF SACRAMENTO  
STATE OF CALIFORNIA

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the printer and principal clerk of the publisher of The Sacramento Bee, printed and published in the City of Sacramento, County of Sacramento, State of California, daily, for which said newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sacramento, State of California, under the date of September 26, 1994, Action No. 879071; that the notice of which the annexed is a printed copy, has been published in each issue thereof and not in any supplement thereof on the following dates, to wit:

September 26, 2005

I certify (or declare) under penalty of perjury that the foregoing is true and correct and that this declaration was executed at Sacramento, California, on September 26, 2005.

  
(Signature)

NO 858 PUBLIC NOTICE

NOTICE OF PUBLIC HEARING  
SACRAMENTO METROPOLITAN  
AIR QUALITY MANAGEMENT DISTRICT  
COUNTY OF SACRAMENTO

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3. Lower the NOx emission limits for new and existing units rated at or above 5 mmBtu/hr input, and
4. Establish exemptions from new and revised NOx emission limits for existing units with low annual fuel usage.

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Rule 411 was created in response to the requirement of the Federal Clean Air Act Amendments of 1990 that the District submit NOx Reasonably Available Control Technology (RACT) rules for stationary sources. Rule 411 also fulfilled the requirement of Health and Safety Code section 40919(a)(3) that required the District to implement Best Available Retrofit Control Technology (BARCT) for all existing permitted stationary sources.

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ATTENTION: Ali Mohamad  
(916) 874-4850

RIN TT 109/26/2005

CNS-870805#

THE SACRAMENTO BEE