



# COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

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Mr. Marty Kay  
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Science and Technology Advancement  
21865 E. Copley Drive  
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Dear Mr. Kay:

## **Comments on Proposed Amended Rule 1110.2**

The Sanitation Districts of Los Angeles County (LACSD) appreciate the opportunity to comment on Proposed Amended Rule (PAR) 1110.2 for internal combustion engines (ICE) over 50 bhp. LACSD is responsible for wastewater collection and treatment for approximately 5.2 million people in Los Angeles County as well as solid waste management for a major portion of the County. Currently we operate three 4,261 bhp lean burn (LB) landfill gas (LFG) fueled engine-generators at our Puente Hills Landfill (PHLF), a single 400 kW digester gas-fueled LB cogeneration ICE at the Valencia Water Reclamation Plant and five 1,564 bhp natural gas-fueled rich-burn (RB) engines driving secondary influent pumps at our Joint Water Pollution Control Plant (JWPCP). The PHLF and JWPCP engines are currently operating with individual NO<sub>x</sub>/O<sub>2</sub> CEMS.

Reciprocating engines are an integral part of our operating philosophy given our continuous need to have reliable pumping and electrical power generation at all times. Engines are also an important component of effective management and utilization of landfill or digester gas, which we view as valuable resources of renewable energy. In fact, the State of California through SB 107 requires that investor owned utilities have 20 percent of its electricity from renewable sources by 2010. In addition, California, through its *Climate Action Plan* and AB32, has intended that renewable fuels be part of the solution for reducing the state's carbon footprint. The *Climate Action Plan* specifies that 20 percent of the energy from renewables must come from bioenergy resources. Thus, LACSD believes that all reasonable means should be used by the permitting authorities to encourage energy production from biofuels. The comments presented below focus on specific concerns LACSD has with PAR 1110.2 and instances where we believe the proposed amendments are contrary to California mandates encouraging development of renewable energy.

### **Natural Gas BACT Retrofit**

The issue of greatest concern to LACSD is the requirement to retrofit existing biogas engines to meet natural gas BACT standards. At issue here are the technical feasibility and economics of retrofitting engines to achieve compliance, and the precedent setting nature of these requirements.

A stated goal of the proposed rule change is to “*require facilities to retrofit or replace their equipment to achieve BACT emission levels*” (2007 AQMP Control Measure #2007MCS-01). In the case

of LFG-fired engines, we do not know of any similar engines that are operating successfully at the proposed natural gas BACT standard. A 1,060 kW engine with a selective catalytic reduction (SCR) unit is currently operating at the Pacific Palms Hotel in the City of Industry, partially fueled by landfill gas (approximately 25 to 30 percent of the total heating value). This supplemental fuel has non-detectable levels of siloxanes and is not representative of an engine operating on LFG. Assuming a system would work, meeting the standards would require an extensive biogas clean-up system to prevent poisoning of SCR/oxidative catalysts on the exhaust stream. Adding to the cost of this system would be the engineering required to install this system in facilities that were not originally designed for this equipment. Also, this blanket BACT retrofit requirement puts LB biogas engines in an unfair position when compared to RB natural gas engines. A RB engine can comply with the BACT retrofit requirement by installing a modern air/fuel ratio controller and a three-way catalyst. While there is expense that will be incurred, no additional fuel treatment is needed and the footprint shortage is not as severe. We strongly recommend that SCAQMD Staff address these technological "achieved in practice" and retrofit cost issues as part of this rule making.

While PAR 1110.2 is the first to apply draft Control Measure #2007MCS-01, it is likely that SCAQMD will next target turbine facilities under Rule 1134, and boilers under Rule 1146. As a result of these tightening regulations, facilities will likely revert to flaring instead of risking the expense of unproven technology. Such actions would be contrary to state mandates for renewable energy use.

SCAQMD permitting policy has always recognized all of the factors that go into developing an effective and economical solution to landfill/digester gas management and has always been technology neutral in any mandates to burn these gases. SCAQMD staff in meetings and in the PAR 1110.2 staff report contend that biogas facility owner/operators have other energy options available, such as low emission fuel cells, microturbines and gas clean-up to vehicle fuel. If these technologies were economically viable, they would have been considered during project development, but the cost of these devices coupled with the low energy output per device, generally rule out their use. To date, most applications with this equipment have been demonstration in nature, with much of the capital for the projects provided for through grants. Thus we consider many of the other low emission options to not be comparable to engines; we object to the technology bias within PAR 1110.2.

In addition to the technical issues surrounding natural gas BACT retrofits, there is the precedent setting nature of SCAQMD rule development staff making policy that is counter to the decisions made by permitting staff. This is certainly true in the case of permitting new equipment whereby the permitting staff established what is reasonable BACT for that equipment. In many cases the affected facilities were recently permitted and constructed. A basic tenet of any control strategy is that the equipment must serve out a useful life before being subject to new requirements. PAR 1110.2 conflicts with this long-held tradition.

In light of these technical, economic and policy issues, LACSD strongly recommends that PAR 1110.2 extend the biogas exemption on emission limits or adopt language that would allow adequate returns on investments and time for technology to advance. The latter concept currently exists in Rule 1146.2 for small boilers. Our suggested language is as follows:

*"On or after January 1, 2012, no person shall operate in the District any landfill or digester gas-fired engine that is more than 15 years old, based on the original date of installation, which does not meet the emission limits specified in Table III [BACT limits]."*

### **Biogas-Fired Engines and Natural Gas Usage**

Staff has added language to PAR 1110.2 eliminating the engine efficiency correction and requiring new engines to meet the extremely stringent DG standards for all engines, if a facility burning landfill or digester gas uses 10 percent or more natural gas on an annual basis. Energy facilities at landfills are often planned to manage gas for the longest operational period possible during the life of the landfill. Since LFG generation follows a bell curve in terms of volume and may have less than optimum gas BTU content on either side of the curve, natural gas is often used to supplement, or stabilize the combustion process. A stable combustion process results in fewer emissions, and higher destruction efficiency for toxic air contaminants. The permitting staff generally reviews each project individually and makes a case-by-case determination on the amount of natural gas needed to sustain a project. Financing and overall economics of the project are often dependent upon the facility being able to supplement with some level of natural gas. Once again, actions that discourage biogas projects are counter to the state's mandate for utilities to use renewable fuels. Also, the rulemaking staff is making decisions counter to the permitting staff who thoroughly evaluates the circumstances of each application. More importantly, this conflict within an agency brings uncertainty to every permitting project.

We strongly recommend that the PAR 1110.2 provide language that allows the usage of natural gas for landfill and digester gas-fired engines up to 25 percent of the heat input, for stabilization purposes.

### **Efficiency Correction Factor Determination**

PAR 1110.2 (d)(C)(i) provides for the determination of a biogas engine's energy consumption by using ASME Performance Test Code (PTC) 17 at the average load. While LACSD appreciates the retention of the efficiency correction and recognizes the need for improving uniformity and compliance determination, we question whether ASME PTC-17 will be effective in practice. Even with a single load test, the PTC is very burdensome and complicated. The current language is also deficient in that only  $q_a$ , net specific energy consumption based on net mechanical power output, is specified, which requires a calibrated dynamometer. For engine generators,  $q_b$ , or energy consumption based on net electrical power output, would be more appropriate. Section 7.3.2.1(d) of the PTC admits that "with few exceptions, the engine manufacturers' shops are the only facilities that are adequately equipped with calibrated test equipment; therefore it is recommended ... tests be conducted at the works of the engine manufacturer."

We suggest that the ASME PTC-17 requirement be modified to allow the use of alternate test methods or the manufacturer-determined efficiency, subject to approval by the Executive Officer. It may also be better to specify the precise formula and the essential inputs for determining  $q_a$  in Btu/hp-hr or  $q_b$  in Btu/kW-hr without requiring strict adherence to PTC-17. For example, the proposed rule already mentions the use of the LHV of the fuel, but this can be further clarified as determined independently by ASTM Method D-1826 (or equivalent).

### **BACT vs. BARCT Emission Limit Averaging Time**

LACSD is also concerned that engines currently subject to 1-hour BACT emission limits will be faced with 15-minute-based requirements. By reducing the emission limits from 36/250/2000 ppm for NOx/CO/VOC, respectively to 11/30/70 ppm over 15 minutes, PAR 1110.2 will *not just match natural gas BACT levels but exceed them*, since current BACT limits are based on a 1-hour average. While the 15-minute average works well with inspections via portable analyzers and we recognize the precedent within current Rules 1110.2, 1134 and 1146, it is inappropriate to go beyond BACT when the stated

### **New CEMS Compliance Dates**

For existing engines that will need to install new CEMS or add CO CEMS, the proposed compliance schedule is unrealistic. As currently written, engine operators must apply for new or modified CEMS by 1/1/08 and have the changes completed and operational by 7/1/08. We request that at minimum, an additional six months be allowed to bring new monitors online. This is reasonable considering that a shortage of CEMS contractors or backlog with instrument manufacturers may occur, and one year is typically the minimum for large agencies to specify, procure and install capital equipment.

With the pump engines at JWPCP, the five CEMS units are housed in a specially sized and designed building. To comply with PAR 1110.2, we must retrofit each unit to add CO CEMS. The lack of space available in the current CEMS cabinets means that either major reconfiguration is required or entirely new cabinets will be needed. Any modification to the current CEMS must also require careful scheduling to maintain engine and CEMS availability. For these reasons, we request that the CEMS installation/operational deadline in PAR 1110.2 Table VII be revised to January 1, 2009. Likewise the certification tests would then be completed by March 30, 2009. As to the CEMS application deadline of 1/1/08, that date is reasonable provided the proposed amendments are adopted on 6/1/07.

### **Startup Exemption**

On the provision for a 15-minute exemption from emission limits during engine startups in PAR 1110.2 (h)(12), we request that the allowance be increased to at least 30 minutes. As you know, emission compliance for rich-burn engines cannot be achieved without sufficient engine and catalyst warm up. Additional flexibility is warranted since the required temperature and warm up period may vary with engine and catalyst design, operating load, as well as unit-specific exhaust system design.

For LB engines there is no need of catalyst warm up, but for units such as our PHLF engines, the air-to-fuel ratio controllers perform best if the engines are not accelerated to normal load for 10 to 15 minutes after a cold start. Abnormally high emissions may still occur during the delayed ramp-up that is part of startup operation, and thus should be exempted.

Further, there is a practical basis for a 30-minute startup exemption due to the use of block data averages. Block averages are much more straightforward to use, implement and analyze compared to rolling averages. This approach is widely used in CEMS data acquisition systems, including the ones at LACSD. For engine startups that can occur at any time, even a short thermal stabilization period will often impact two 15-minute averages. Thus we request for the startup exemption to be extended to *"no more than 30 minutes or two consecutive 15-minute block averages"*.

### **Reporting of Noncompliance Based on Portable Analyzers or Operating Parameters**

LACSD is concerned with the requirement in PAR 1110.2 (f)(D)(vii) for non-CEMS equipped engines to report excess emissions suggested by portable analyzers or operating parameters according to Rule 430 procedures. Neither portable analyzers, control equipment parameters, nor engine operating conditions can be expected to provide the same level of measurement quality as conventional Rule 218 or 40 CFR 60 compliant CEMS. Doing so would create a host of difficult issues such as false breakdown or deviation reports and questionable excess emission calculations based on imprecise correlations between operating parameters and emissions.

rulemaking objective is to bring existing BARCT engines to BACT. We are also not aware of any federal or state emission standards based on a 15-minute average.

Practically speaking, reducing the averaging period from 1-hour to 15 minutes also unreasonably limits operational flexibility for existing engines. In our experience with RB engines, excess emissions are usually mitigated in the short term by engine speed changes or engine shutdown. Air-to-fuel ratio controller (AFRC) adjustments require instrumentation technicians separate from engine operations staff. To maintain pumping operations in these situations, a redundant unit typically must be ramped up or freshly started. Thus, the process of discovering and reacting to an exceedance easily takes more than 15 minutes.

We request that a 1-hour average be considered in PAR 1110.2 emission limits for consistency with both BACT guidelines and state distributed generation standards.

#### **CEMS Requirement for Engines with an Aggregated 1,000 bhp**

LACSD is also concerned about the increased and perhaps unnecessary cost that the proposed rule will have on industry. Currently for non-CEMS engines, compliance has consisted of a source test once every three years. While this needs to be more frequent, the current proposal for aggregating engines for the purpose of applying CEMS will be costly and unnecessary. For example in the inspections conducted by SCAQMD, the non-compliance rate improved from over 80% to about 50% between the first and second rounds. This demonstrates that compliance can improve with closer attention to engine operation, and that the CEMS proposal in PAR 1110.2 is perhaps overkill. Weekly monitoring with a handheld monitor, as well as appropriate alarms, can dramatically increase compliance without the excessive cost of a CEMS. Our point is that under PAR 1110.2, engine testing will be changed from the current timetable of once every three years to weekly monitoring, a vast improvement which will also dramatically improve compliance.

LACSD does recognize SCAQMD's concern that under the current rules, large engines such as 999 bhp units, are escaping frequent monitoring. However, we cannot see the logic of requiring CEMS on smaller engines, which would occur under SCAQMD's proposed aggregation of engines for the purpose of applying CEMS. As a compromise, LACSD suggest that the aggregation language be eliminated, and the CEMS threshold be decreased to 750 bhp. In this way, it will be ensured that larger engines with the greater potential for emissions apply the more expensive monitoring option, but smaller engines will be captured under the weekly handheld monitoring provisions.

#### **Carbon Monoxide (CO) CEMS for Lean Burn Engines**

The additional CEMS requirements in PAR 1110.2 would apply to both LB as well as RB engines. However, the compliance statistics compiled by SCAQMD do not provide any basis for CO analyzers on lean-burn engines. Specifically, while 28% of the RB engines tested through surprise inspections were out of compliance, none of the LB engines tested failed on CO. We request that the CO continuous monitor requirement for LB engines be deleted from the proposed rule.

As an option, LACSD supports the approach in the *CARB RACT/BARCT Determination for Stationary Spark-Ignited Internal Combustion Engines*. In Chapter IV, Section K (pg. IV-17) of that document, the guideline reads “*NOx emission readings [with a portable NOx analyzer] in excess of the limits shall not be considered a violation, so long as the problem is corrected and a follow-up inspection is conducted within 15 days of the initial inspection.*” Besides recognizing the lower accuracy of portable analyzers, this language essentially gives a grace period for self-detected exceedance. Even if the grace period were tightened from 15 days to perhaps 1 day, it would incentivize the immediate resolution or mitigation of excess emissions for engine operators desiring to avoid reporting. For this alternative, the following language can be added to the end of Section (f)(D)(vii):

*“Any potential noncompliance indicated by portable analyzers or operating parameters may be exempted from Rule 430 reporting requirements so long as the engine operator immediately corrects the noncompliance and a follow-up inspection is conducted within 24 hours of the initial test. All these instances should be logged and the records made available for inspection.”*

### **Summary and Conclusions**

SCAQMD has added natural gas BACT retrofit provisions to biogas engine requirements which will encourage operators to choose flaring over energy recovery projects. This is contrary to California’s policies with respect to use of renewable energy and biofuels to reduce greenhouse gas emissions.

Because existing engines were permitted and installed with predetermined economics and BACT feasibility, they should be allowed to operate for a useful life of 15 years and for a proper return on investment to owners. Similarly, the feasibility, life and economics of a resource recovery project often depend on natural gas augmentation. Current precedent established by SCAQMD permitting staff is to accept 25% by volume of natural gas blending for biogas equipment.

With the efficiency correction for emission limits, we appreciate the reference to ASME PTC-17, but request for alternate approved methods or that the manufacturer-determined efficiency to be allowed.

On the emissions averaging period, it is inappropriate for a BARCT rule to exceed BACT limits. Please consider a 1-hour average for any future amendments to the emission limits in the rule.

The original purpose of PAR 1110.2 was to provide adequate monitoring to ensure a greater level of compliance. This objective could be achieved without aggregating engines for the purpose of applying CEMS, but focusing on only the largest engines (≥750 hp), and allowing the remainder to perform weekly monitoring with handheld monitors. Likewise, the SCAQMD compliance statistics show no basis for requiring CO CEMS for existing LB engines at all. In addition, the compliance schedule for new CEMS is too short. We request for at least 6 additional months for installing new CEMS on existing facilities.

The startup exemption is an important provision for day-to-day engine operations. However, we request for this to be extended to 30 minutes or 2 consecutive 15-minute blocks in order to account for unit specific differences in design and operation.

Finally, we object to Rule 430 reporting of excess emissions that are only suggested by operating parameters or portable analyzers. We suggest a 24-hour grace period in which reporting is not required if the problem can be corrected and documented.

Mr. Marty Kay

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February 23, 2007

We again thank you for the opportunity to comment on PAR 1110.2. Please contact the undersigned at (562) 699-7411 ext. 2113, should you have any questions regarding these comments.

Very truly yours,

Stephen R. Maguin



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