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U.S. Environmental Protection Agency
Public Docket A-96-40
Waterside Mall, Room M-1500
401 M Street, SW
Washington, DC 20460

To Whom It May Concern:

The State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) are pleased to provide the following comments to the U.S. Environmental Protection Agency (EPA) regarding the agency's Notice of Proposed Rulemaking (NPRM) for the *Control of Emissions of Air Pollution from Nonroad Diesel Engines*, as published in the *Federal Register* on September 24, 1997 (62 FR 50152).

The control of emissions from heavy-duty engines used in nonroad applications has been identified as a priority by state and local air quality regulators because these sources are significant contributors to elevated levels of ozone and fine particulate matter (PM_{2.5}). Given the limited authority individual states have to regulate heavy-duty engines, this federal initiative is critical to the ability of states and localities to demonstrate long-term attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) for these pollutants. The recent promulgation of new NAAQS for ozone and PM_{2.5} heightens the need for further reductions in precursor emissions. Additionally, diesel particles are classified by EPA as a Group B-1 probable human carcinogen and, further, excessive smoke from equipment using diesel engines is a major source of nuisance complaints received by air quality agencies across the country.

A recent report published by EPA, *Nitrogen Oxides: Impacts On Public Health and the Environment* (August 1997), concludes that, in addition to contributing to the reduction of ozone and PM_{2.5} levels, decreasing emissions of nitrogen oxides (NO_x) will also "likely help improve the environment by decreasing the adverse impacts of acid deposition, drinking water nitrate exposure, eutrophication of waterbodies, global warming, NO₂ exposure, nitrogen saturation of terrestrial ecosystems, PM formation, stratospheric O₃ depletion, toxics exposure, and visibility impairment."

Emissions from diesel engines used in nonroad applications represent a significant and growing share of the emissions inventory of both NO_x and PM. As much as 90 percent of the PM emitted by diesel engines is in the form of super-fine inhalable particles, which many studies conclude have the greatest adverse affect

on public health. Compared to highway vehicles, emissions from nonroad equipment are relatively undercontrolled. Given the current inequity in emission control requirements and the availability of known control technologies and strategies, reducing emissions from this source sector could represent one of the more cost-effective available control options.

STAPPA and ALAPCO strongly support the need for further emission controls on nonroad diesel vehicles and equipment and believe that this proposed rule generally represents an appropriate strategy for achieving this goal. We ask, however, that EPA consider the following comments and recommendations, which we believe will improve the program. Our comments are grouped according to NO_x standards, PM standards, enforcement and compliance issues, and other issues.

NO_x Standards

With respect to the NO_x standards proposed by EPA for nonroad diesel engines, STAPPA and ALAPCO believe that EPA should seriously consider the viability of a more stringent Tier III NO_x standard in the context of the technical feasibility review scheduled for 2001.

Once final, the nonroad diesel engine standards proposed by EPA will dictate the stringency of the controls for this sector well into the next millennium. While implementation of the proposed standards will substantially reduce per-engine NO_x emissions, history has shown that growth in the number of vehicles and equipment can quickly offset the emissions benefits associated with more stringent certification standards. Further, recent data suggest that the emissions inventory for diesel-powered mobile sources may currently be underestimated by as much as 50 percent. Because many of the heavy-duty diesel engines used in nonroad applications are similar to those used in highway trucks and buses, STAPPA and ALAPCO believe that in conducting its feasibility review of this program, to be concluded in 2001, EPA should consider a more stringent NO_x standard for Tier III engines. Accordingly, the associations urge the agency to include language in the final rule that explicitly commits to considering a more stringent NO_x standard as part of the feasibility review and notes that establishment of a more stringent NO_x standard is a possible outcome.

Given that the phase in of Tier III standards will only begin in the year 2006, engine and emission control equipment manufacturers would be afforded ample time to develop effective and durable NO_x controls for these vehicles and equipment. While applying established emission reduction technologies -- such as injection rate shaping, exhaust gas recirculation and air-to-air after-cooling -- to nonroad engines will require research and development on the part of manufacturers, much of the technology required to reach the proposed standards is already being used in various highway applications and can be readily adapted for use in nonroad engines. Further, as described in the NPRM, a substantial

portion of the NO_x reductions mandated by this proposal can be achieved by relatively simple engine modifications, such as injection timing retards, which do not necessitate technology advances.

Particulate Matter Standards

Regarding PM standards for nonroad diesel engines, STAPPA and ALAPCO recommend that EPA formally commit in the final rule to 1) promulgate an appropriate Tier III PM standard, 2) conduct a thorough assessment of aftertreatment technologies as part of the 2001 technical review and 3) complete - - in time to allow for its consideration as part of the 2001 feasibility review -- the development of an appropriate transient test procedure for nonroad diesel engines that ensures in-use PM emission reductions.

STAPPA and ALAPCO believe that Tier III particulate standards should be promulgated for all categories of nonroad diesel engines. Given the improved understanding of the adverse health effects associated with exposure to fine particulate matter, the recent promulgation of an ambient standard for PM_{2.5} and the long timeframe associated with this proposal, the associations believe that it is incumbent upon EPA to include a tighter PM standard for the engines covered by this rule.

EPA cites the inverse relationship between NO_x and PM emission controls as a rationale for choosing not to include Tier III PM standards. State and local air quality agencies recognize the challenge associated with attempting to simultaneously optimize NO_x and PM emissions through engine modifications alone. However, we believe that significant developments and improvements in aftertreatment technologies will enable engine manufacturers to further lower particulate emissions without adversely affecting NO_x. It is incumbent upon EPA to fully consider and incorporate the opportunities associated with these technological advances.

There is potential for catalyst and filter technology to be used in combination with other technologies, such as exhaust gas recirculation and ignition timing retard, to reduce both PM and NO_x emissions. Oxidation catalysts have substantial performance histories in nonroad equipment. Worldwide, approximately 250,000 pieces of nonroad equipment have been outfitted with catalytic converters. Preliminary data gathered as part of an ongoing construction equipment retrofit pilot project in the northeast indicate that such widely used construction equipment as crawler tractors and front-end loaders are suited to use passive particulate filters. These aftertreatment devices can reduce PM emissions in excess of 90 percent.

The other primary reason cited by EPA in deciding not to move forward with Tier III PM standards at this time is that the current steady-state test procedure used for certification purposes is inadequate to ensure real-world particulate reductions.

We concur that a representative transient test procedure is needed. However, this weakness was identified in the Tier I rulemaking and states and localities believe that the time is now right to develop and utilize a more representative test procedure.

Compliance Issues

Smoke Opacity Standards

STAPPA and ALAPCO support the inclusion of a certification short test for smoke opacity that is consistent with the snap-idle tests now being used by some state and local governments for in-use enforcement of diesel smoke emissions. Additionally, we believe that it is incumbent upon EPA to adopt opacity cutpoints that are appropriate for the engine technology against which they will be applied.

The associations are sensitive to industry's desire for international harmonization and understand EPA's interest in retaining its current outdated smoke opacity test procedure pending the outcome of the ISO effort. Nevertheless, it is imperative that EPA also consider the immediacy of the need for states and localities to have a reasonably stringent and technically sound certification procedure that is replicable in the field for in-use enforcement purposes. EPA should consider adopting the Society of Automotive Engineers' J1667 smoke opacity test procedure that has been widely endorsed by regulators and the regulated community.

A shortfall of the J1667 procedure is that it does not include compliance cutpoints. From the state and local air quality regulators' perspective, it is critical that EPA adopt an opacity standard that takes into account the anticipated improvement in emission characteristics of the engines covered by this rule. The current smoke standard allows a maximum 50-percent opacity (i.e., clearly "dirty"). This standard, however, is inconsistent with the 40-percent cutpoint many states currently apply for in-use emissions from onroad truck engines with similar technologies. Since well-maintained new technology diesel nonroad engines are expected to be capable of operating without emitting visible smoke, STAPPA and ALAPCO believe that a cutpoint of 30-percent maximum opacity (i.e., nearly invisible) should be adopted for these engines.

Certification Test Fuel

The use of low-sulfur diesel fuel is not required in nonroad vehicles and equipment, except for a portion of the California nonroad diesel fleet. Nevertheless, EPA has proposed allowing manufacturers to certify their nonroad engines on low-sulfur highway diesel fuel. Since this would result in a significant underestimation of real-world PM emissions for nonroad vehicles and equipment, STAPPA and ALAPCO believe that, at a minimum, inventory estimates would have to be corrected to account for this difference. Preferably, the associations

support the extension of the highway low-sulfur diesel fuel requirements to nonroad applications. We believe that the cost-effective PM reductions achieved through the on-highway program justify the expansion of this program to all mobile sources. Further, the use of low-sulfur fuel would enable manufacturers to develop and utilize aftertreatment technologies that are susceptible to the adverse effects of elevated fuel sulfur. The associations also urge EPA to resolve the issue of fuel sulfur levels so that the outcome can be taken into consideration as part of the 2001 feasibility review.

Also related to the issue of certification test fuel is the practice of blending used oil. Some manufacturers of onroad and nonroad diesel engines allow for the blending of used oil, such as spent crankcase and transmission fluids, as a standard practice in engine operation. STAPPA and ALAPCO believe that the addition of these and similar substances to the fuel supply can play a role in elevating in-use emissions of regulated and nonregulated pollutants. Incorporation of such substances into the fuel supply in significant quantities is also suspected of resulting in premature failure of certain emission control components, including trap oxidizers and oxidation catalysts.

STAPPA and ALAPCO believe if the practice of blending used oil and similar substances is recommended or condoned by diesel engine manufacturers, this practice should be accounted for in the certification process as part of the certification test fuel. Fuel mixing in this manner should be conducted in the maximum proportions recommended by the manufacturer; such proportions should be clearly stated in any literature supplied by the manufacturer to the ultimate purchaser. Further, manufacturers that do not condone the practice of blending used oil into diesel fuel should, likewise, be required to indicate this prohibition in literature that is supplied to the ultimate purchaser.

Useful Life

Data on newer nonroad diesel engines suggest that EPA's decision to retain the current 8,000-hour useful life requirement is inappropriate and should be increased. EPA adopted the existing 8,000-hour useful life requirement based on data showing that older technology engines were typically first rebuilt after about 8,000 hours of use. However, data on newer engines suggest that the first rebuild typically occurs at around 14,000 hours of use. Consequently, STAPPA and ALAPCO recommend that the regulatory useful life for these engines be increased to 14,000 hours. This change would be consistent with the extension of the useful life requirements for passenger cars from 50,000 to 100,000 miles.

Warranty Period

STAPPA and ALAPCO suggest that the emissions warranty coverage for diesel nonroad engines be extended beyond the current 3,000-hour/five-year requirement, to reflect the longer useful life of these engines. Major emission-

related components on light-duty vehicles are now warranted for 80 percent of the vehicle's regulatory useful life. STAPPA and ALAPCO recommend that the major emission-critical components of diesel engines used in nonroad vehicles and equipment be similarly warranted for 80 percent of their useful life. Assuming the 14,000-hour useful life recommended above, emission-related components should be warranted for 11,000 hours.

Rebuild Requirements

The associations support the adoption of requirements to ensure that rebuilt engines retain the low-emission characteristics to which they were certified. This requirement already applies to onroad diesels. Since it is expected that many of the same firms that manufacture diesel rebuild kits for onroad applications will engage in the nonroad business, similar requirements seem feasible for this sector.

Deterioration Factors

We support the proposal to allow individual manufacturers to establish deterioration factors (DFs) for their engine families. This approach is appropriate given the large number and diversity of engine families covered by this rule. Further, this approach will minimize the technical and administrative burden on EPA and allow for the use of more model-specific DFs and is consistent with other EPA efforts to streamline the compliance process.

Averaging , Banking and Trading

STAPPA and ALAPCO acknowledge the importance of the Averaging, Banking and Trading (ABT) program to manufacturers of diesel nonroad engines in terms of lowering their compliance costs and allowing them to continue to produce a full line of products to meet the demands of a broad and diverse nonroad vehicle and equipment manufacturing industry. We want to ensure, however, that such flexibility does not jeopardize the realization of the full potential benefits of these new standards and believe that EPA's justification for increasing flexibility for ABT is insufficient.

Historically, the ABT program for heavy-duty highway engines, upon which this nonroad proposal is largely based, has not been supported by an adequate in-use enforcement program to ensure that the family emission limits (FELs) selected by the manufacturer are being met in the real world. STAPPA and ALAPCO believe that the increased flexibility of the heavy-duty ABT program adopted in the highway rule and proposed in this NPRM must be balanced with an increased commitment to in-use compliance testing and enforcement.

Our primary concern is that engine manufacturers have little incentive to set FELs that adequately account for in-use variability and deterioration since there is no credible enforcement program to identify engine families that are not achieving

these certification levels in-use. Consequently, engine manufacturers may have an incentive to "shave" their compliance margins and maximize banked credits. We believe this issue can be resolved with a firm commitment by EPA to routinely test and enforce in-use emission standards.

With regard to the proposed PM trading program, we ask that EPA limit the use of PM credits to those power categories in which the credits were generated. In addition, to prevent the delay of Tier II standards for many engines, EPA should limit the availability of early PM credits to the three-year period prior to the applicable Tier II standards taking affect.

STAPPA and ALAPCO are concerned with some of the specific changes EPA has proposed for the ABT program in the NPRM. In particular, we question the elimination of credit discounting and the extension of the limited life credit provisions beyond three years. The historical ABT program provided manufacturers considerable flexibility to produce higher-emitting engines that prove technically difficult or costly to bring into compliance with the certification standards. EPA has not provided sufficient evidence to suggest that further flexibility is needed to meet the NO_x or PM standards proposed in this rule.

Other Issues

Voluntary Low-Emission Engines

STAPPA and ALAPCO applaud EPA's recommendation to create a voluntary low-emission engine certification program. This type of program will provide an incentive for the development of both improved engine designs and aftertreatment technologies. We concur with EPA's conclusion that nonroad equipment may, in some cases, be better suited to alternative fuel applications than are highway vehicles and expect that this initiative will encourage more research and development on this front.

We strongly endorse the concept incorporated in the Blue Sky Series engine proposal included in the NPRM. This forward-looking program will encourage both the design and manufacture of new families of low-emitting engines and improvements to existing lines of engines and vehicles. The Blue Sky Series program will also reward manufacturers who have invested in alternative fuel nonroad products. STAPPA and ALAPCO offer the following recommendations for enhancing the viability of this initiative.

In its current form, the program would allow manufacturers to generate ABT credits through the manufacture and sale of engines meeting the Blue Skies Series standards. The Blue Skies Series program could be strengthened by allowing purchasers of low-emission vehicles, rather than manufacturers, to receive credit for emission reductions. Allowing states and other end users to "own" the credits from the purchase of clean vehicles and equipment will provide a stronger market

push for those engines than if manufacturers receive the credits. This would also ensure that credits are used in the area in which they are generated. This expanded market will, in turn, drive manufacturers to produce greater numbers of Blue Skies Series engines and help lower the cost of these units through economies of scale. In order for this alternative to work, however, the engine manufacturers would have to agree to forego the ABT credits associated with the production of these low-emission engines. Instead, these engine families would be excluded from the manufacturer's fleet average compliance calculations.

We believe the Blue Skies Series approach proposed by EPA in the NPRM and the alternative approach offered by STAPPA and ALAPCO could co-exist, with individual manufacturers provided the ability to choose the approach they prefer.

In conclusion, we thank you for the opportunity to comment on this important proposal. On behalf of STAPPA and ALAPCO, we look forward to working in close partnership with EPA as the agency further develops a final program for controlling emissions from nonroad diesel engines. If we can provide you with any further information as you consider our comments, please do not hesitate to contact either of us or S. William Becker, Executive Director of STAPPA and ALAPCO.

Sincerely,

John Elston
Chair
STAPPA Mobile Sources and Fuels Committee

Richard Baldwin
Chair
ALAPCO Mobile Sources and Fuels Committee