Control of Hazardous Air Pollutants from Mobile Sources

Summary and Analysis of Comments

Chapter 3
New Light-Duty Vehicle Standards

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

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SUMMARY AND ANALYSIS OF COMMENTS:
CHAPTER 3
NEW LIGHT-DUTY VEHICLE STANDARDS

3. NEW LIGHT-DUTY VEHICLE STANDARDS

What We Proposed:

The comments in this section correspond to Section VI of the Notice of Proposed Rulemaking (NPRM), and therefore deal with the proposed light-duty vehicle standards. A summary of the comments received, as well as EPA's response to those comments, is located below. For the full text of comments summarized here, please refer to the docket for this rulemaking.

The MSAT NPRM proposed new cold temperature non-methane hydrocarbon (NMHC) standards for gasoline light-duty vehicles and trucks. We expected that by fully utilizing available Tier 2 hardware and software control strategies during cold temperature operation, manufacturers would be able to achieve this standard without major changes to Tier 2 vehicle designs and without the use of additional technology.

We are finalizing, as proposed, two separate sales-weighted fleet average NMHC standards: 0.3 grams/mile for vehicles at or below 6,000 pounds gross vehicle weight rating (GVWR) and 0.5 grams/mile for vehicles over 6,000 pounds, including medium-duty passenger vehicles (MDPVs). The lower weight category will consist of light-duty vehicles (LDVs) and light light-duty trucks (LLDTs). The heavier weight category will consist of heavy light-duty trucks (HLDTs) and MDPVs. NMHC emissions will be measured during the Cold Federal Test Procedure (FTP) test at 20º F, which already requires hydrocarbon measurement. The new standard does not require additional certification testing beyond what is required today with "worst case" model selection of a durability test group.

As proposed, we will begin implementing the standard in the 2010 model year (MY) for LDV/LLDTs, and MY 2012 for HLDT/MDPVs. In the first years of compliance, manufacturers must ensure that 25% of the vehicles sold in each weight category achieve compliance. Manufacturers will phase-in to 100% fleet compliance by MY 2013 for LDV/LLDTs, and MY 2015 for HLDT/MDPVs. The implementation schedule begins three model years after the Tier 2 phase-in is complete for each vehicle class.

3.1 Cold Temperature Requirements

What Commenters Said:

In its public hearing testimony, the American Lung Association (ALA) commented that it supports cold weather NMHC standards.

Northeast States for Coordinated Air Use Management (NESCAUM) noted that the NESCAUM states generally agree with the approach taken for control of cold start emissions from motor vehicles.

Toyota commented that it is encouraged by the Environmental Protection Agency's effort to reduce ambient air toxics, stating that each component of the proposed rule promises to improve and ensure sustained reductions of hazardous air pollutants (HAP) within our ambient environment. They added that the proposed cold temperature NMHC standards and evaporative emission system requirements will propel the automotive industry toward further utilization of ultra clean vehicle technology. Toyota commented that the Agency's approach to regulate mobile source air toxics through cold temperature hydrocarbon controls is both effective and logical. Toyota submitted data confirming that benzene and NMHC levels highly correlate at different temperatures, in agreement with the Agency approach of controlling benzene emissions by way of a cold temperature hydrocarbon standard.

The Manufacturers of Emission Controls Association (MECA) commented that it supports the U.S. EPA's proposed rule to reduce hazardous air pollutants from mobile sources by lowering benzene content in gasoline; reducing exhaust emissions from passenger vehicles operated at cold temperatures; and reducing emissions that evaporate from, and permeate through, portable gasoline containers.

The State of Alaska Department of Environmental Conservation (ADEC) supports the EPA proposal for cold temperature HC standards. ADEC commented that without a cold temperature standard, manufacturers would only certify vehicles emission standards at higher temperatures required by the Federal Test Procedure. With a cold temperature standard, vehicles sold in Alaska are meeting emission standards in winter and summer. Reducing these HC will help reduce production of secondary particulate, an important control for places like Fairbanks on the verge of becoming nonattainment for PM2.5.

Anchorage commented that it supports improvement in hydrocarbon emission controls at cold temperatures. The commenter stated that European application of cold temperature controls suggests that adoption of this technology may be an inexpensive means to significantly reducing exposure to air toxics in cold climates.

Letters:
American Lung Association OAR-2005-0036-0365
NESCAUM OAR-2005-0036-0993
Toyota Technical Center OAR-2005-0036-0773
Manufacturers of Emission Controls Association (MECA) OAR-2005-0036-0808
Alaska Department of Environmental Conservation, Division of Air Quality (ADEC) OAR-2005-0036-0975
Anchorage, Municipality of, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976

Our Response:

The cold NMHC standards reflect the greatest achievable reductions of air toxics from motor vehicles and will achieve significant environmental benefits. Colder temperature emissions standards highlight an extremely effective opportunity to reduce air toxics by utilizing the same emission control technology presently used at warmer operating temperatures. The

standard emission testing temperatures and cycles represent validation points for the emission control approaches, but they should not be treated as the only areas of emission control optimization. Emission controls should operate effectively across all real-world conditions experienced in normal driving, including operation at temperatures outside of standard emission test temperatures.

3.1.1 Standard Level and Feasibility

What Commenters Said:

Equal Standards for Both Vehicle Weight Categories

The ALA commented that the proposed cold weather NMHC standard for HLDTs and MDPVs should contain a second phase that reduces emissions to the same standard as applies to LDVs in the future.

STAPPA/ALAPCO commented that they do not believe trucks of 6,001 pounds to 8,500 pounds GVWR and passenger vehicles up to 10,000 pounds, warrant less protective standards than vehicles of 6,000 pounds GVWR or less, with the possible exception of work trucks.

The Wisconsin Department of Natural Resources (WDNR) commented that it believes that the NMHC cold temperature standards for Light-Duty vehicles weighing above 6,000 pounds should be the same as for vehicles less than 6,000 pounds.

Different Standards for Different Weight Categories

The Alliance of Automobile Manufacturers (Alliance) commented that it supports the proposal for separate fleet average 20°F NMHC standards for vehicles up to and including 6,000 lbs. GVWR and 6,001-8,500 lbs. GVWR. The commenter stated that Light-Duty Vehicles (LDV) and Light-Duty Trucks 1&2 (LLDT ≥6,000 lbs.) generally are equipped with smaller displacement engines and may have fewer cold-temperature emissions control constraints due to engine design. The commenter stated that it is reasonable to expect improved emissions performance for these vehicles at colder temperatures based on manufacturers' ability to locate the catalytic converter and oxygen sensors closer to the engine and achieve faster warm-up times, and therefore a quicker transition to closed-loop fueling.

The Alliance noted, however, that these lighter vehicles typically have more restrictive packaging constraints which may limit optimal emission control methods and options. (The commenter noted that in some instances, hardware modifications on smaller vehicles would not be feasible due to packaging constraints underbody or within the engine compartment.) The commenter stated that, in contrast, HLDT vehicles (LDT3&4) 6,001-8,500 lbs. GVWR generally are equipped with larger displacement engines and have additional physical constraints that must be accounted for when manufacturers design emission control systems; many of these vehicles are designed for higher performance and/or utility purposes, and these differences force unique considerations which make it appropriate to consider a higher standard for vehicles in these

weight classes. The commenter stated that heavier vehicles (>6,000 lbs. GVWR), designed for utility and/or high performance, generate significant heat and exhaust temperatures. Thus, catalyst systems may need to be designed and located farther from the engine to be protected from heat damage, particularly for compliance with US06 requirements in the Supplemental Federal Test Procedure (SFTP). Also, given the location and design constraints of these catalyst systems, hydrocarbon control at cold temperatures is more difficult.

The Alliance noted that HLDT engines typically require more fuel to start and maintain idle stability at cold temperatures and quench zones are larger. The commenter also stated that the fuel required to start and idle is more than can be fully oxidized in combustion and subsequently is carried through to the tailpipe prior to the catalyst reaching operating efficiency (light-off), resulting in increased hydrocarbon emissions at cold start. The issue is compounded by the increased exhaust mass flow prior to and during catalyst light-off, due to increased engine friction at cold temperatures and higher/prolonged idle speeds. This results in increased mass emission rates relative to lighter vehicles. The Alliance believes that these are compelling reasons why the proposed 20°F NMHC standards need to scale with increasing vehicle weight. The Alliance also believes that the 6,000 lbs GVWR split point between the two fleet-average 20°F NMHC standards is also an appropriate proposal based on standard testing methodology differences. The commenter stated that Adjusted Loaded Vehicle Weight (ALVW) test weight methodology is applied to vehicles over 6,000 lbs GVWR (vs. curb weight loading for vehicles up to 6,000 lbs. GVWR), and the more severe loading method produces higher loads and consequently higher emissions on the chassis dynamometer. Lastly, the Alliance commented that the 6,000 lbs GVWR split point, combined with a sales-weighted averaging approach, also avoids unwarranted bias and provides appropriate flexibility with 20° F emissions compliance for full line vehicle manufacturers.

Level of Standards is Appropriate

Toyota stated that data submitted with its comments substantiates the ratio approach upon which the Agency predicates their proposal for a cold temperature hydrocarbon standard (see docket number OAR-2005-0036-0773.1, p.3 for Graph 1: Non-methane organic gas (NMOG) mass emissions versus MSAT emissions). The commenter noted that in its data, Vehicle 1, a Tier 2 Bin5/Ultra Low Emission Vehicle II (ULEV II), and Vehicle 2, a Tier 2 Bin 8/ULEV II, demonstrate the consistency of the ratio between air toxic and hydrocarbon emissions. Lastly, Toyota stated that it supports this strategy as a successful means of HAP control.

Standards Will Be Challenging

The Alliance commented that the proposed standards will be extremely challenging to achieve for the industry. Because the proposed standards are based on full useful life performance, vehicles will require more robust designs, must rely on adequate fuel specifications, and will need fuel quality control measures in the field. The commenter also believes that with respect to the feasibility of the standards, manufacturers face a host of competing requirements for exhaust emissions compliance. The commenter further stated that, in order to maintain acceptable combustion quality, drive quality and defroster function, some engines may not be able to employ equivalent emission control strategies at 20°F relative to what

is feasible at 75°F. The commenter also stated that EPA must ensure that it does not adopt 20°F NMHC standards that effectively increase the stringency of the current Tier 2 standards, which are still completing phase-in. Further, the commenter noted, other EPA rulemaking efforts such as the fuel economy labeling proposal, and related proposed test procedure changes, must not inadvertently increase the stringency of the proposed 20°F NMHC standards.

The Alliance commented that, with respect to development and certification, manufacturers currently must comply with FTP and SFTP requirements, at ambient temperatures between 68°F and 95°F. The commenter stated that these higher temperature standards under Tier 2 affect hardware decisions, such as catalyst location, and make it difficult to simultaneously obtain optimal performance at colder temperatures, which are encountered less often in-use. As a result of these competing requirements, the commenter noted, engineering tradeoffs are often necessary and vary depending on the class of vehicle (i.e., passenger car vs. utility truck). The commenter noted that another potential impediment to meeting 120,000 mile full useful life standards is the wide array of commercial fuel properties found in the field. The commenter stated that optimal emissions control designs are often limited by poor volatility fuels during transitional months and inadequate control of fuel additives (which are needed to maintain combustion efficiency). Consequently, calibration compromises are often needed to accommodate the wide range of fuels and provide for robust start-up and driveability at cold temperatures.

The Alliance commented that fundamental engine design and operating parameters are important determinants of the maximum potential for cold temperature emissions control. Open-loop fueling control must be used until the emissions control system reaches a sufficient temperature to allow closed-loop control and optimized fueling strategies, and maintaining acceptable combustion quality at lower temperature is an issue due to the potential for reduced lean tolerance and reduced fueling precision, and it requires a tradeoff between fueling control and spark timing.

Mitsubishi commented that it strongly disagrees with EPA's statement in the proposal "we believe our proposed standards can be met by the application of calibration and software approaches similar to those currently used at 50° F and 75° F" (71 FR 15847; col. 2). The commenter further stated that it presented EPA with information demonstrating its inability to achieve EPA's proposed Cold NMHC fleet average standard for light duty vehicle/light light duty trucks of 0.3 g/mile for certification and full useful life (FUL) with only calibration/software changes. The commenter noted that its feasibility study, based on 2005 and 2006 MY certification data and utilizing only calibration and software changes, indicated that even reaching 0.4 g/mile for FUL is extremely difficult. Based on these results, Mitsubishi believes that it will be unable to meet the proposed standard without major vehicle redesign to incorporate additional hardware such as a secondary air injection system or hydrocarbon trap or significantly alter their United States fleet mix to 100% expensive, Super Ultra Low Emission Vehicle (SULEV) certified vehicles. The commenter did not provide any data in its comments to support their feasibility concerns.

Mitsubishi further commented that in order to ensure their vehicles' driveability, calibrations for cold conditions are compromised by the worst possible case of fuel properties

(especially volatility) that are available in the U.S market and would limit the best optimizations for cold NMHC control. The commenter suggested that if EPA believes that cold NMHC reduction can be accomplished by the improvement of fuel calibration only, it requests that EPA reduce such variance of the fuel properties in the U.S. market. The commenter noted that there are other difficulties which they believe affect its ability to meet the proposed standard. The commenter stated that it has limited opportunities for compliance flexibility (i.e., trading between fleets) since it only manufacturers vehicles under 6,000 lbs. Thus, the commenter proposes that manufacturers of only light-duty vehicles should be allowed to comply with an alternative standard between the less than and greater than 6,000 pound standards.

EPA's Feasibility Study Not Appropriately Assessing Emission Capabilities

The auto industry commented that the EPA's feasibility study and assessment does little to demonstrate feasibility to meet the proposed 20° F NMHC standard. The commenter stated that the actions used by EPA were too simplistic and that the study does not even confirm the EPA premise that only calibration changes would be needed to meet the 20° F NMHC standards, as EPA decided that operation of secondary air injection was determined to be a requirement and that not all vehicles are equipped with this very costly hardware. The commenter noted that EPA disregarded standard industry calibration practices and did not attempt to validate a calibration which would satisfy driveability and customer satisfaction requirements.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association (ALA) OAR-2005-0036-0365
Mitsubishi Motors R&D of America OAR-2005-0036-0882
STAPPA/ALAPCO OAR-2005-0036-0836
Toyota Technical Center OAR-2005-0036-0773
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

While some comments indicated that vehicles over 6,000 lbs. GVWR should be required to meet the same standards as the lighter vehicles, we continue to believe that it is appropriate to have different standards for vehicles of different weights. Generally, we believe that heavier vehicles will have inherent design differences in the engine and emission control system hardware specifically to address expected customer usage and duty cycle. These design differences, including engine size and exhaust aftertreatment design may result in a much higher degree of difficulty achieving the same emission levels as vehicles not designed with similar utility capabilities.

The level of the standard for both of the weight classes was determined from analyzing certification Cold Carbon Monoxide (CO) results from many different vehicles and model years. (See Chapter 5 of the Regulatory Impact Analysis (RIA) for the analysis.) This data set included vehicles certified to Interim Non-Tier 2 and Final Tier 2 emission standards (at 75° F) and tested at different weights representing a variety of GVWRs. We observed a general trend of

increasing emission levels with increasing test weight across all available certification results. While the data set included only a limited number of Final Tier 2 vehicles certified to the over 6,000 lbs. GVWR, the data did support the engineering expectation of higher emissions with heavier vehicles. Some heavier vehicles did perform at levels approaching the lighter weight standard; however, the initial over 6,000 lbs. GVWR vehicles certified to Tier 2 standards likely represent the cleaner, less challenging vehicles which are generally the first to be phased in to the Tier 2 program. These vehicles may initially contain hardware content not typical of similar weight Tier 2 vehicles. Additionally, the feasibility test programs performed by EPA further support the level of the standard and confirm that heavier vehicles with typically larger application specific engines will have higher difficulty achieving the same emission levels as lighter and smaller engine vehicles. It is likely that extensive additional hardware beyond that required by Tier 2 would need to be added for many of these heavier models if required to meet the same emissions standards as the lighter models. However, as these heavier vehicles become Tier 2 compliant, we will continue to monitor emission levels and evaluate the appropriateness of the higher cold temperature standard.

We do not agree with the comment that vehicles over 6,000 lbs. will be tested with a more severe ALVW loading test method. With the phase-in of Tier 2, vehicles over 6,000 lbs. GVWR are required to comply with Cold CO standards using Loaded Vehicle Weight (LVW) test weights rather than ALVW test weight which is required for Non-Tier 2 vehicles. LVW is curb weight plus 300 lbs. while ALVW is the average of LVW and the typically much higher GVWR. This reduction in the test weight loading method will occur on all light duty vehicles over 6,000 lbs. GVWR by 2009 MY when 100% Tier 2 compliance is required. However, even with this change in test weight methodology, heavier vehicles will generally be tested at higher weights due to their higher curb weights and are typically equipped with larger engines and therefore remain a greater challenge for cold temperature emissions control than lighter vehicles.

One commenter indicated that they did not agree with our assessment that the proposed standards for light-duty vehicles could be met with the same calibration and software approaches currently used at 50° F and 75° F. While not all software and calibration approaches can be used at 20° F (e.g., lean start operation), we continue to believe that many of the long-established approaches are appropriate and will be highly effective. Similarly, prior to the implementation of the California 50° F NMHC requirement, many of the approaches to reduce emissions at 75° F were not used at 50° F, but later proved effective at that lower temperature. To support our position that these same controls could be used at colder temperature, our own limited feasibility test program specifically targeted using only the controls already available and practiced at 50° F and 75° F. Although this feasibility test program was limited in scope, its results indicate that these controls are highly effective at approaching and complying with the level of the new standard (consistent with engineering expectation). We continue to believe that efforts to control engine emissions and to optimize existing Tier 2 hardware generally will negate any need to incorporate SULEV or other new hardware. This is because most hardware improvements used in SULEVs (catalyst loading, oxygen sensors) are generally not immediately usable following a cold start. Therefore, compliance with the standards will necessitate optimized calibration and software controls to limit emissions produced by the engine prior to catalyst light-off.

The commenter also indicated that its own assessment based on its 2005 and 2006 MY certification data indicated their inability to achieve the new standard. However, these 2005 and 2006 MY vehicles used for the assessment do not reflect any control efforts. Some significant level of development effort would be required to fully explore existing opportunities in these models. In fact, certification results for some of this manufacturer's current vehicle offerings indicated that some specific vehicles models are close to achieving or have achieved the standard without any intentional development effort to control NMHC emissions. In addition, the design of the fleet average standards provides flexibility to manufacturers by allowing them to meet different vehicle specific standards (i.e., Family Emission Limits) to address any unique situations. Manufacturers can choose which vehicle lines to concentrate their emission reduction efforts while still achieving an overall fleet wide average.

The 0.3 g/mile fleet average standard for the vehicles below 6,000 lbs GVWR is appropriate and supported by our assessment (see Regulatory Impact Analysis). We know of no engineering basis for this standard not being technically achievable. We consequently do not accept the commenter's suggestion to adopt an alternative standard for manufacturers with a product line limited to vehicles below 6,000 lbs. GVWR. Indeed, there are nine other manufacturers with product lines exclusively below 6,000 lbs. GVWR that did not provide similar comments requesting an alternative standard.

The auto industry also stated that EPA must ensure that it does not adopt 20°F NMHC standards that effectively increase the stringency of the current Tier 2 standards. As supported by our assessment (see Chapter 5, section 5.1.2, of the RIA), we believe that level of the standard does not inadvertently increase the stringency of current Tier 2 standards by requiring new hardware for the cold standard. Several Tier 2 certified packages in our assessment already achieve emissions levels below the new standard including one manufacturer's entire vehicle product line. With respect to development and certification, the commenter noted that manufacturers currently must comply with FTP and SFTP requirements, at ambient temperatures between 68°F and 95°F. The commenter stated that these higher temperature standards under Tier 2 affect hardware decisions, such as catalyst location, and make it difficult to simultaneously obtain optimal performance at colder temperatures, which are encountered less often in-use. As a result of these competing requirements, the commenter noted, engineering tradeoffs are often necessary and vary depending on the class of vehicle (i.e., passenger car vs. utility truck). We understand the possibility of competing requirements depending on vehicle class and we believe separate fleet averages properly address these challenges. In addition, we are providing lead time and program flexibilities such as averaging to help manufacturers address issues with various models across their product lines.

While comments were submitted suggesting that potential variances in the fuel properties could affect NMHC emission levels, no supporting data was submitted substantiating any problem in the fuel pool or any vehicle emission impact. In fact, yearly fuels surveys performed by the Alliance indicate no issues in the US fuel supply during the colder months that would impact the ability to achieve these emission standards. Certain challenges may exist for some vehicle systems during certain seasonal fuel changes or other temporary situations but these situations can be managed through robust emission control approaches. We believe that some manufacturers and vehicle models are already using these robust approaches based on the

existing certification test results (see Chapter 5 of the RIA). We are providing the manufacturers with lead time necessary to evaluate and address any issues with their products.

We disagree with the auto industry comment that EPA's feasibility study and assessment does little to demonstrate feasibility to meet the proposed 20° F NMHC standard. Data to support the feasibility of complying with the 20˚ F NMHC standard includes evidence from recent model year certification emissions data submitted to EPA and a vehicle feasibility evaluation program (see Chapter 5, section 5.1.2, of the RIA). The certification data indicate many production vehicle models with emissions levels below the cold standard, which presumably (because they are production vehicles) employ thoroughly validated calibrations which would satisfy driveability and customer satisfaction requirements. The feasibility evaluation program undertaken by EPA examined the effects of making only calibration modifications to two vehicles deemed challenging due to their heavier weight.

In the case of the first feasibility vehicle, equipped with secondary air injection, we acknowledge that not all vehicles are equipped with this hardware. We also recognize that this first feasibility vehicle study does not constitute a production calibration and that additional development effort would be needed to achieve manufacturer functional objectives for cold starts. We recognize that significant development efforts are needed to prove out control strategies and are providing the lead time necessary for these development efforts. However, this test program demonstrates that in the case of this typical secondary air injection equipped vehicle, additional emission reduction opportunities exist by activating at cold temperatures the hardware already employed on the vehicle. The second feasibility vehicle demonstrates emission reduction opportunities with calibration changes only. For the second feasibility vehicle, testing was performed using a production calibration which would satisfy driveability and customer satisfaction requirements. These calibrations are already used in a production vehicle sold in Europe. Also, the second vehicle was selected because it is a heavier weight vehicle in the lighter weight class. In both cases, the feasibility testing clearly showed significant emissions reductions are achievable through calibration alone at cold temperatures. Given the lead time provided in the final rule, we believe manufacturers have ample time to further develop calibrations that meet the full range of driveability and customer satisfaction requirements.

3.1.2 Tailpipe Standards over All Cycles

What Commenters Said:

Control MSATs Over All Drive Cycles

The New Jersey Department of Environmental Protection (NJDEP) commented that although it supports adoption of the proposed cold temperature exhaust emission standards, it believes that EPA must look beyond technologies to reduce emissions during cold start modes to technologies that reduce MSAT emissions under all driving modes.

Benzene-specific Standards Necessary

The New York Department of Environmental Conservation (NYDEC) commented that EPA has not considered tailpipe standards for benzene (or any other mobile source air toxics such as acetaldehyde and polycyclic aromatic hydrocarbons) for any class of vehicle or engine in this rulemaking. NYDEC commented that it believes that EPA depends on the incorrect assumption that all hydrocarbon species react similarly in catalytic converters and that regulations targeting hydrocarbons reduce the emissions of all species equally (and based on this assumption, EPA claims that regulation of vehicle and engine hydrocarbon emissions is sufficient to control the (non-evaporative) toxic emissions of vehicles and engines). The commenter stated that it is "well known that different classes of hydrocarbons react at different rates in catalytic converters." The commenter further stated that it is well documented that benzene can be produced in automotive catalytic converters. The commenter stated that it can find no evidence that EPA even acknowledges the fact that catalytic converters can make benzene, much less considered it in developing this rule. The commenter then noted that it conducted its own study to evaluate the production of benzene in catalytic converters, using a 2005 passenger car from its own fleet and sampling and analytical methods adapted from EPA's Photochemical Assessment Monitoring Stations (PAMS) program. The commenter noted that exhaust was sampled before and after the main catalytic converter, which is not exactly the situation tested in the literature (because their test vehicle was equipped with more recent technology, specifically close-coupled pre-catalysts upstream of both sample locations; thus, the before-catalyst sample is not engine-out). In its comments, the commenter provided detailed information on how the study was performed, assumptions made, and the results of the study.

Lastly, the NYDEC commented that EPA cannot simply assume that other programs will protect the public from tailpipe benzene emissions. The commenter further commented that EPA cannot meet the mandate of section 202(l)(2) of the Clean Air Act (which requires EPA to regulate benzene emissions to obtain the "greatest degree of emissions reduction achievable") without any analysis, particularly when existing emissions control devices (catalytic converters) produce additional benzene under common operating conditions. The commenter believes that explicit tailpipe benzene standards must be promulgated.

Letters:
New Jersey Department of Environmental Protection (NJ DEP) OAR-2005-0036-0829
New York State Department of Environmental Conservation (NY DEC) OAR-2005-0036-0722

Our Response:

We believe that NMHC standards are an effective method of significantly reducing benzene and many air toxics levels in the exhaust as supported by the MSAT EPA test programs (see Regulatory Impact Analysis, Chapter 5). These programs confirmed that under the current cold start emission drive cycles, benzene levels closely correlate with NMHC levels and a reduction in NMHC will result in proportional reductions in benzene and other toxics. All current data suggests that the overwhelming majority of toxics from Tier 2 vehicles are emitted immediately following the cold start. While commenters suggested that toxics are also created or released during other operating modes, data is limited, especially for Tier 2 vehicles regarding

toxics formation across the catalyst during specific operating conditions (i.e., rich hot operation). Additionally, the areas of operation described in the comments where formation is expected to occur (i.e., over 81 miles per hour) represent a small fraction of vehicle miles traveled(VMT).

As indicated by the commenter, toxics formation in the engine and catalytic converter is a complicated issue that can be influenced by many factors not yet fully understood. The limited data provided by the commenter warrants further investigation to determine the mechanisms for benzene formation. However, we must evaluate the issue in the context of SFTP compliant Tier 2 vehicles, which will likely perform differently than the older vehicles included in the test data referenced by the commenter. Further, the operating conditions that result in possible toxics formation may not be demonstrated in current test procedures, thus requiring investigation beyond the current test cycles (e.g., operation at sustained high-loads even more severe than US06 cycle). Therefore, an assessment of tailpipe benzene emissions would need to be accompanied by an evaluation of the drive-cycle conditions that generates the conditions for benzene formation. Thus, we plan to undertake a more in-depth investigation to understand the potential mechanisms for toxics formation and the vehicle operating conditions under which such toxics may be formed.

3.1.2.1 PM-specific Standards

What Commenters Said:

The ALA, NESCAUM, and the NJDEP commented that there is a need for the establishment of particulate standards for gasoline passenger vehicles.

The Alliance commented that in addition to hydrocarbon reductions, it believes that the Agency provided considerable discussion on the co-benefits of particulate matter (PM) and ozone reductions. The Alliance commented that it agrees that PM emissions from mobile sources have steadily decreased as manufacturers comply with stringent federal exhaust emission standards. Additionally, the commenter stated that the proposed vehicle regulations should directionally reduce PM emissions from Tier 2 vehicles. Furthermore, the commenter believes that the reduction in volatile organic compounds (VOCs) will reduce the potential for secondary atmospheric formation of fine PM. However, the commenter stated that even though PM will be directionally reduced, it does not believe that PM from Tier 2 vehicles is an issue at the cold temperature conditions which are the subject of this proposed rulemaking. The commenter noted a feasibility study that EPA commissioned and stated that, according to the study, PM averages for all of the vehicles tested at 20°F were at or below the existing 75°F certification standards. The commenter believes that this indicates that PM is currently controlled adequately at cold temperatures, and with the proposed hydrocarbon standards leading to potential further decreases in PM, it would be inappropriate for EPA to consider the regulation of PM at cold temperatures.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association (ALA) OAR-2005-0036-0365
New Jersey Department of Environmental Protection (NJ DEP) OAR-2005-0036-0829

Northeast States for Coordinated Air Use Management (NESCAUM) OAR-2005-0036-0993, -0369

Our Response:

Our findings regarding PM levels during colder operation indicated that temperature appears to be an important factor for direct PM, similar to NMHC findings. While the PM averages for all of the vehicles tested at 20°F were at or below the existing 75°F certification standards, the levels were unexpectedly high compared with PM emissions at 75°F and these relatively low mileage vehicles were approaching or exceeding the Tier 2 PM standards. The cold temperature vehicle standards are being established to control MSATs under CAA 202(l) and PM reductions are a coincidental benefit. We will continue to fully investigate direct PM from gasoline engines, including the possible need for future cold PM standards as well as PM control under other operating modes.

3.1.2.2 Standards Do Not Account For Testing Requirements in Fuel Economy Label Standard

What Commenters Said:

The commenter noted that the proposed heater/defroster change to the fuel economy labeling requirements is a major change and will impact the existing Cold CO standards, the proposed 20°F NMHC standards, and the proposed Fuel Economy Labeling procedures. The commenter further stated that this test procedure change would be most appropriately addressed as a separate rulemaking initiated only after more extensive research is completed. The commenter believes that EPA needs to take into consideration the effect of heater/defroster activation on the 20°F NMHC standards proposed in the MSAT rule, and defer any test procedure changes until a thorough analysis of heater and/or defroster use and related emission impacts has been performed. The Alliance noted that the data EPA collected come from EPA's two feasibility studies, one conducted internally and the other conducted by Southwest Research Institute (SwRI), and that these two studies show conflicting results. The commenter noted that SwRI's results on the gasoline vehicle demonstrate a decrease in hydrocarbon emissions with heater/defroster use, while the Agency's in-house study shows an increase; thus, the commenter believes that more extensive study of this issue is needed.

Letters:
Alliance of Automobile Manufacturers (Alliance), OAR-2005-0036-0881
American Lung Association (ALA), OAR-2005-0036-0365
New York Department of Environmental Conservation, OAR-2005-0036-0722
New Jersey Department of Environmental Protection, Division of Air Quality, OAR-2005-0036-0829

Our Response:

Regarding new testing requirements under the Fuel Economy (FE) Labeling final rule, we do not believe there are any emissions issues related to use of the heater/defroster during the cold FTP test.[1] In the FE rule, we specifically structured the heater/defroster protocol to reflect real-world operation, (i.e., delay heater/defroster operation until 2 minutes into the test) which also has the effect of mitigating any emissions impact during start-up. EPA testing, including a vehicle feasibility demonstration (see Chapter 5, section 5.1.2.2, of the RIA) which followed the protocol, indicates that emission levels are not affected by the new testing requirements. Nevertheless, the FE rule gives manufacturers until the 2011 model year before heater/defroster use is required. We believe this allows sufficient lead time to investigate any potential emissions impacts.

3.1.3 Harmonizing with California LEV II Standards

What Commenters Said:

Harmonize with California LEV II

NESCAUM commented that California has finalized more stringent tailpipe HC emissions standards that EPA could adopt nationally.

The NJDEP commented that technologies exist today and are being utilized by automobile manufacturers for compliance with California's Low Emission Vehicle II (LEV II) exhaust and evaporative emission standards that reduce MSAT emissions under all driving modes. NJ DEP believes that EPA should consider adoption of exhaust and evaporative emission standards equivalent to or beyond California's Low Emission Vehicle (LEV) II standards.

The NJDEP also commented that it does not believe that Tier 2 exhaust and evaporative emission standards represent the greatest emission reductions achievable. EPA should consider adoption of exhaust and evaporative emission standards equivalent to or beyond the LEV II standards. For example, the Partial Zero Emission Vehicle (PZEV) and Advanced Technology PZEV (ATPZEV) exhaust and zero evaporative emission standards would achieve significant MSAT emission reductions beyond the lowest emitting of the federal Tier-2 emission standards. NESCAUM has estimated the LEV II exhaust and evaporative emission standards would yield a 23% reduction in air toxic emissions (benzene, 1,3 butadiene, formaldehyde and acetaldehyde were included in the analysis), on average for the states of New York, Massachusetts, and Vermont (states that had adopted the LEV program at the time of the study) relative to the federal Tier 2 evaporative and exhaust emission standards (Source: "California Low Emission Vehicle Program in the Northeast, NESCAUM, March, 2004).

The NJDEP commented that the MSAT reduction benefits can be attributed to several of the key requirements of the LEV II program including: the LEV II program's declining non-

[1] "Fuel Economy Labeling of Motor Vehicles; Revisions to Improve Calculation of Fuel Economy Estimates," Final Rule, 71 FR 77872, December 27, 2006.

methane organic gas (NMOG) fleet average requirement; the PZEV, ATPZEV and ZEV exhaust emission standards and durability requirements; and the zero evaporative emission standard applicable to PZEVs and ATPZEVs.

The NJDEP also commented that New Jersey has adopted the LEV standards for vehicles delivered for sale in New Jersey on and after January 1, 2009. EPA should consider adoption of analogous exhaust and evaporative emission standards on a national basis to achieve additional MSAT reductions beyond those resulting from the proposed cold temperature emission standards. Such harmonization with California's most stringent emission standards would also simplify compliance for the automobile manufacturers with the vehicle emission standards across the nation.

Do Not Harmonize with California LEV II

The Alliance commented that the Tier 2 program provides comprehensive and extensive emissions reductions from mobile sources and noted that these standards have yet to fully phase-in and the fleet has yet to turn over for these vehicles. The commenter believes that setting more stringent Tier 2 NMOG standards, such as those adopted by California in its LEV II programs, would not provide any meaningful emissions benefits. The commenter believes that Tier 2 emission standards, in conjunction with the proposed 20°F NMHC standards and LEV II evaporative standards, will reduce further the inventory differences between programs. The Alliance commented that it maintains support of the federal Tier 2 program and the large emission benefits it affords. Lastly, the commenter stated that, for the reasons EPA cited in the preamble, coupled with the fact that LEV II provides no meaningful reductions compared to Tier 2, it agrees with EPA's conclusion that no changes should be made to the Tier 2 program.

Letters:
NESCAUM OAR-2005-0036-0993
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
New Jersey Department of Environmental Protection, Division of Air Quality (NJDEP) OAR-2005-0036-0829

Our Response:

We continue to believe, for reasons discussed below, that it would not be appropriate to adopt more stringent tailpipe standards under normal test conditions beyond those contained in Tier 2. It is possible that a future evaluation could result in EPA reconsidering the option of harmonizing the Tier 2 program with California's LEV-II program or otherwise seeking emission reductions beyond those of the Tier 2 program and those being finalized today.[2]

Section 202(l)(2) requires EPA to adopt regulations that contain standards which reflect the greatest degree of emissions reductions achievable through the application of technology that will be available, taking into consideration existing motor vehicle standards, the availability and

[2] See Sierra Club v. EPA, 325 F. 3d at 380 (EPA can reasonably determine that no further reductions in MSATs are presently achievable due to uncertainties created by other recently promulgated regulatory provisions applicable to the same vehicles).

costs of the technology, and noise, energy and safety factors. The cold temperature NMHC program finalized today is appropriate under section 202(l)(2) as a near-term control: that is, a control that can be implemented relatively soon and without disruption to the existing vehicle emissions control program. We did not propose additional long-term controls (i.e., controls that require longer lead time to implement) because we lack the information necessary to assess their appropriateness. We believe it will be important to address the appropriateness of further MSAT controls in the context of compliance with other significant vehicle emissions regulations (discussed below).

In the late 1990's both the EPA and the California Air Resources Board finalized new and technologically challenging light-duty vehicle/truck emission control programs. The EPA Tier 2 program focuses on reducing NOx emissions from the light-duty fleet. In contrast, the California LEV-II program focuses primarily on reducing hydrocarbons by tightening the light-duty NMOG standards.[3] Both programs will require the use of hardware and emission control strategies not used in the fleet under previously existing programs. Both programs will achieve significant reductions in emissions. Taken as a whole, the Tier 2 program presents the manufacturers with significant engineering challenges in the coming years. Manufacturers must bring essentially all passenger vehicles under the same emission control program regardless of their size, weight, and application. The Tier 2 program represents a comprehensive, integrated package of exhaust, evaporative, and fuel quality standards which will achieve significant reductions in NMHC, NOx, and PM emissions from all light-duty vehicles in the program. These reductions will include significant reductions in MSATs. Emission control in the Tier 2 program will be based on the widespread implementation of advanced catalyst and related control system technology. The standards are very stringent and will require manufacturers to make full use of nearly all available emission control technologies.

Today, the Tier 2 program remains in its phase-in. Cars and lighter trucks will be fully phased into the program with the 2007 model year, and the heavier trucks won't be fully entered into the program until the 2009 model year. Even though the lighter vehicles will be fully phased in by 2007, we expect the characteristics of this segment of the fleet to remain in a state of transition at least through 2009, because manufacturers will be making adjustments to their fleets as the larger trucks phase in. The Tier 2 program is designed to enable vehicles certified to the LEV-II program to cross over to the federal Tier 2 program. At this point in time, however, it is difficult to predict the degree to which this will occur. The fleet-wide NMOG levels of the Tier 2 program will ultimately be affected by the manner in which LEV-II vehicles are certified within the Tier 2 bin structure, and vice versa. We intend to carefully assess these two programs as they evolve and periodically evaluate the relative emission reductions and the integration of the two programs.

Today's final rule addresses toxics emissions from vehicles operating at cold temperatures. The technology to achieve these new standards is already available and we project that compliance will not be costly. However, we do not believe that we could reasonably propose further controls at this time. There is enough uncertainty regarding the interaction of

[3] NMOG includes emissions of nonmethane hydrocarbons plus all other nonmethane organic air pollutants (for example, aldehydes), which are ozone precursors. For gasoline and diesel vehicles, NMHC and NMOG emissions levels are very similar.

the Tier 2 and LEV-II programs to make it difficult to evaluate today what might be achievable in the future. Depending on the assumptions one makes, the LEV-II and Tier 2 programs may or may not achieve very similar NMOG emission levels. Therefore, the eventual Tier 2 baseline technologies and emissions upon which new standards would necessarily be based are not known today. Additionally, we believe it is important for manufacturers to focus in the near term on developing and implementing robust technological responses to the Tier 2 program without the distraction or disruption that could result from changing the program in the midst of its phase-in. We believe that it may be feasible in the longer term to seek additional emission reductions from the base Tier 2 program, and the next several years will allow an evaluation based on facts rather than assumptions.

Additionally, adopting the LEV II emission standards would likely not result in reductions in MSAT emissions under all driving modes, contrary to the commenter's assertion. As evidenced by the need to adopt cold temperature standards, emission controls on vehicles certified to stringent levels at 75° F may not guarantee proportional reductions at all driving conditions. LEVII standards do not contain requirements below 50°F. The past SFTP rulemaking resulted in standards that were established to address unique driving conditions that were not captured with a more stringent 75° F standard. As such, establishing emission standards for other driving modes, including cold temperature, as we have done in this rule, will result in the largest reductions in MSAT emissions.

The summary and analysis of comments concerning harmonizing with the evaporative standards of LEVII is contained in section 3.2 below.

3.1.4 Timing and Phase-in

What Commenters Said:

Timing Should Be Accelerated

NESCAUM commented that, given the fact that the controls require only calibration and software changes and not hardware changes, they encourage EPA to establish an earlier program start date than the dates proposed.

Timing and Phase-In Are Appropriate

The Alliance commented that the relative stringency of 20°F NMHC standards will increase incremental development workload and facility needs exponentially. The commenter stated that an appropriate phase-in approach is critical to avoid a front-loaded phase-in or one of short duration, which could further magnify the workload burden in the short-term; the commenter believes that even the current proposed phase-in creates a significant impact on facility capacity needs over a relatively short time period, affecting each manufacturer to a different degree. The commenter also stated that a manufacturer's testing capacity should be utilized steadily in order to prevent "vacant/orphan" facilities at end of phase-in; an aggressive phase-in requirement would create an unnecessary cost burden for manufacturers. The commenter further stated that the proposed rule recognizes these cost issues and provides

sufficient mechanisms for phase-in flexibility in an attempt to partially mitigate these costs.

The Alternative Phase-In Requires More Flexibility

The Alliance noted that the alternative phase-in program outlined by the Agency in this rulemaking emphasizes the ability to bring in additional products meeting the 20ºF NMHC standard under accelerated timing, and that the alternative phase-in schedules are especially attractive for the flexibility afforded the manufacturer. However, the Alliance commented that the additional stipulation regarding the initial years of product phase-in significantly curtails the necessary flexibility. Further, the Alliance stated, even if a manufacturer introduces a significant volume of products meeting this standard early, in 2008 and 2009, there is a possibility of debit generation as early as 2010 despite accelerated compliance efforts on the part of the manufacturer. To avoid limiting the flexibility of its alternative phase-in program and diminishing the incentive to strive for early compliance, the Alliance recommends that EPA amend the proposal and fully align with the alternative phase-in schedule as outlined in Title 13, California (CA) code of Regulations Section 1961 (b)(2) without additional constraints (which effectively eliminates any "early-year" phase-in requirements of an alternative phase-in).

Nissan Motor Company, Ltd (Nissan) commented that it understands EPA's desire to reduce mobile source air toxics (MSAT), and that several elements of the proposed MSAT rule can be implemented within the timetable set forth in the proposed rule. However, the commenter believes that the proposals for regulating vehicle tailpipe NMHC at low temperatures appear to require powertrain hardware changes and increased development and laboratory facility burden that cannot be accommodated within the time-table in the NPRM.

In its comments, Nissan suggested a modification to the phase-in provisions for HLDT/MDPV which it believes could produce a demonstrable benefit for EPA. The commenter believes that the purported relief offered by the phase-in schedule of 25%/50%/75%/100% is not useable or effective for any manufacturer of a narrow range of HLDT/MDPV engines and truck lines; the commenter believes that the three intermediate phase-in rates mentioned in the proposed rule offer no actual leveling of burden.

Nissan commented that it currently has only one engine configuration (5.6L V8) and only one vehicle platform in the HLDT/MDPV class, and that such a structure means the manufacturer could implement at only one rate (i.e., 100%). The commenter noted that it plans to pull-ahead its full implementation date to model year 2013; the second year of the phase-in. The commenter believes that its targeted 0%/100%/100%/100% phase-in schedule would provide a significant incremental environmental benefit. However, it believes that another provision in the proposed rule inhibits its ability to deliver that benefit; the provision that states "In addition, manufacturers electing to use an alternate phase-in schedule & must ensure that the sum of products is at least 100% for model years and 2012 and earlier for HLDT/MDPVs." The commenter notes that even though it plans to fully (100%) implement low temperature control for HLDT/MDPV in 2013 (when the phase-in requirement is only 50%) the "sum of products and at least 100%" provision obviates its early full implementation schedule and eliminates a net benefit from its early full implementation. The commenter thinks that the provision could be improved, to create mutual benefits, in the following ways:

A. In § 86.1811-10(g)(4)(ii), EPA could simply eliminate the "sum of products ... at least 100% provision, or
B. In §86.1811-10(g)(4)(ii), EPA could modify the "sum of products ... at least 100% requirement to apply to 2013 and earlier, or
C. In §86.1811-10(g)(4)(ii), EPA could allow manufacturers to begin implementation on any schedule that produces a net benefit to EPA, which would be validated by the manufacturer exceeding the "500% phase-in product" requirement for the phase-in period (for example, 525% total), or
D. EPA could move implementation of the low temperature requirement to the 2013 model year for HLDT/MDPV.

Nissan commented that its "Proposal C" above would create flexibility only in the first year of the phase-in schedule while requiring much higher implementation rates in years 2 and 3, and would also pull-ahead 100% compliance by one model year. The commenter stated that this net benefit would also attenuate burden for manufacturers of narrow HLDT/MDPV offerings which is the original intent of the phase-in provision.

Nissan also commented that it believes that the proposed implementation time-table and the inflexibility of the proposed phase-in rules will cause a short-term spike in its facilities development and testing burden. The commenter does not believe that forced investment to cover this transitory spike is an efficient use of limited capital and resources, and suggests the following modifications to the MSAT program:

A. Modify the phase-in compliance calculation method as discussed in 1.C above, and
B. Modify the less-than 100% phase in period from 3 years to 4 years. For example, adopt a nominal phase-in of 20%/40%/60%/80%/100%.

The commenter believes that taken together, these two steps can significantly smooth the burden on facilities, development and testing resources and provide for more efficient implementation.

Mitsubishi Motors (Mitsubishi) commented that it is an Intermediate Volume Manufacturer, and as such has a limited number of vehicle lines and therefore the percentage that needs to be phased-in for a given year affects a much larger portion of their product offerings. The commenter stated that this leads to challenges where it could become very costly and quite difficult to complete enough development work fast enough for compliance (and notes that a large increase in the workload would result in facility expenses proportionately greater than those of the full line manufacturers). The commenter stated that it agrees with the AAM facility expense calculations, except that real estate costs are much higher at their research and development facility in Japan. Therefore, the commenter stated, merely finding a location and constructing such a facility will be very costly and time consuming, and will significantly delay its ability to effectively implement the major vehicle redesign required to meet the proposed standard. Mitsubishi concluded by stating that it believes that additional phase-in time should be allowed to provide enough time to construct new development facilities.

Letters:
Alliance of Automobile Manufacturers (Alliance), OAR-2005-0036-0881
Mitsubishi Motors R&D of America (Mitsubishi), OAR-2005-0036-0882

NESCAUM, OAR-2005-0036-0993
Nissan Technical Center North America (Nissan), OAR-2005-0036-0825

Our Response:

We believe that the finalized start date and phase-in schedule will achieve the greatest amount of emissions reductions in the shortest feasible amount of time. EPA must consider lead time in determining the greatest degree of emission reduction achievable under section 202(l) of the Clean Air Act. Also, for vehicles above 6,000 GVWR, section 202(a) of the Act requires that four years of lead time be provided to manufacturers. We believe that lead time and a phase-in schedule is needed to allow manufacturers to develop compliant vehicles without significant disruptions in the product development cycles. The three-year period between completion of the Tier 2 phase-in and the start of the new cold NMHC standard should provide vehicle manufacturers sufficient lead time to design their compliance strategies and to determine the product development plans necessary to meet the new standards.

We recognize that the new cold temperature standards we are finalizing could represent a significant new challenge for manufacturers and development time will be needed. The issue of NMHC control at cold temperatures was not anticipated by many entities, and research and development to address the issue is consequently at a rudimentary stage. Lead time is therefore necessary before requiring compliance to be demonstrated. While certification will only require one vehicle model of a durability group to be tested, manufacturers must do development on all vehicle combinations to ensure full compliance within the durability test group. A phase-in is needed because manufacturers must develop control strategies for several vehicle lines. Since manufacturers cannot be expected to implement the standard over their entire product line in 2010, we believe a phase-in allows the program to begin sooner than would otherwise be feasible.

The lead time and phase-in are also needed to address facilities issues. Manufacturers raised concerns that a rapid phase-in schedule would lead to a significant increase in the demand for their cold testing facilities, which could necessitate substantial capital investment in new cold test facilities to meet development needs. This is because manufacturers would need to use their cold testing facilities not only for certification but also for vehicle development. Durability test groups may be large and diverse and therefore require significant development effort and cold test facility usage for each model. If vehicle development is compressed into a narrow time window, significant numbers of new facilities would be needed. Manufacturers were also concerned that investment in new test facilities would be stranded at the completion of the initial development and phase-in period.

We took these concerns into consideration when drafting our proposed rule and are finalizing the start date and phase-in as proposed because we continue to believe they address these issues adequately. Our finalized phase-in period accommodates test facilities and work load concerns by distributing these fleet phase-in percentage requirements over a four-year period for each vehicle weight category (six years total). The staggered start dates for the phase-in schedule between the two weight categories should further alleviate manufacturers' burden regarding construction of new test facilities. We recognize that some manufacturers may still

determine that upgrades to their current cold facility are needed to handle increased workload, or that additional shifts must be added to their facility work schedules that are not in place today. The lead time and the four-year phase-in period provide needed time for vehicle manufacturers to develop a compliance schedule that does not significantly interfere with their future product plans.

We have revised the terms of the optional alternative phase-in, in response to public comment. We proposed alternative phase-in schedules for both the LDV/LLDT and HLDT/MDPV weight categories to provide manufacturer flexibility and to encourage early emissions benefits. These alternative schedules included "early-year" provisions to ensure an adequate number of vehicles achieved compliance during the initial years of an alternative phase-in. Specifically, a manufacturer who adopts an alternative phase-in must ensure that the "Anticipated Phase-In × Year" factors in the alternative phase-in equation sum to at least 100% for 2010 and earlier model year LDV/LLDTs, and 2012 and earlier model year HLDT/MDPVs. Commenters were concerned these provisions would create significant hardship, especially for limited-line manufacturers who produce only a narrow range of car lines. (For example, a manufacturer who only sells one configuration in the HLDT/MDPV category would not have the option of certifying only 25% of these vehicles in 2012. To meet our proposed criteria, that manufacturer would have to ensure that the model is fully compliant in 2013; i.e., 100% of their HLDTs/MDPVs. This would eliminate any flexibility for these manufacturers, as noted in comments.

To address these legitimate concerns, we are providing an option that would eliminate the early-year provision for HLDT/MDPV manufacturers as long as their full phase-in is accelerated. As proposed, manufacturers may still apply for an alternative phase-in option in which the equation sum to at least 500%, including an "early-year" provision meeting 100% criteria. However, in response to comments, we are also allowing another alternative phase-in option in which the equation must be at least 600% for HLDTs/MDPVs, without any early-year provision. We believe this will still yield environmental benefits as quickly as possible, while not putting an unreasonable burden on limited-line manufacturers of HLDTs/MDPVs. Manufacturers with limited HLDT/MDPV product offerings will still achieve 100 percent phase-in of the HLDTs/MDPVs before the end of the phase-in schedule in 2015.

Regarding the early-year provisions for LDV/LLDTs, we believe that the proposed early-year requirements provide emissions benefits without unreasonably burdening manufacturers who elect to adopt an alternative phase-in. Manufactures of LDV/LLDTs typically produce a wider variety of configurations in the lower weight category than in the HLDT/MDPV category, thus have more flexibility within the LDV/LLDT category to meet a fleet-average standard. Furthermore, LDV/LLDTs as a group face fewer technological hurdles as do the heavier vehicles. Therefore, we will retain the early year requirements for the alternative phase-in for LDV/LLDTs.

3.1.5 Credits

3.1.5.1 Use of Credits

What Commenters Said:

ALA commented that it opposes the use of credits generated by over-compliance by a manufacturer in one weight class toward meeting a manufacturer's obligation in a heavier or lighter weight class.

The Alliance commented that the availability of credits for early or accelerated efforts to introduce compliant vehicles provides a mechanism for manufacturers to offer products meeting the 20ºF NMHC standard earlier than mandatory and allows customers the opportunity to purchase these vehicles, and that this alternative phase-in structure allowed for early vehicle introduction under both the Tier 2 and California's LEV II programs.

Letters:
American Lung Association (ALA) OAR-2005-0036-0365
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

EPA views the use of credits generated in one weight class toward meeting obligations in a different weight class, and the other averaging, banking, and trading (ABT) provisions, as important elements in setting emission standards reflecting the greatest degree of emission reduction achievable, considering factors including cost and lead time. If there are vehicles that will be particularly costly or have a particular challenge coming into compliance with the standard, the ABT program allows a manufacturer to adjust the compliance schedule accordingly, without special delays or exceptions having to be written into the rule. This is an important flexibility especially given the current uncertainty regarding optimal technology strategies for any given vehicle line. In addition, ABT allows us to consider a more stringent emission standard than might otherwise be achievable under the Clean Air Act, since ABT reduces the cost and improves the technological feasibility of achieving the standard. By enhancing the technological feasibility and cost-effectiveness of the new standard, ABT allows the standard to be attainable earlier than might otherwise be possible.

3.1.5.2 Credits from a Voluntary HDV Program

What Commenters Said:

ALA commented that it opposes the creation of NMHC credits applicable to other vehicle categories from reductions achieved by HDVs.

Letters:
American Lung Association OAR-2005-0036-0365

Our Response:

Our proposal sought comment on voluntary approaches where manufacturers could earn credits by including heavy-duty gasoline vehicles in the program. The ALA's was the only comment responding to this solicitation. Due to insufficient data on such a program's ramifications, as well as the lack of support, we are not including a heavy-duty standard or credit program at this time.

3.1.5.3 Credits and the Family Emission Limit (FEL) Structure

What Commenters Said:

The Association of International Automobile Manufacturers commented that it supports EPA providing the provision that allows manufacturers to optionally certify using Family Emission Limits; however, as described in the proposal, rounding would be required to one decimal place, which would significantly limit manufacturers' ability to use FELs and make it very difficult to earn credits. The commenter recommends that EPA instead allow rounding to two decimal places in order to allow the flexibility which the commenter believes EPA intended with this provision.

Letters:
Association of International Automobile Manufacturers (AIAM) OAR-2005-0036-0973

Our Response:

We believe that rounding FELs to one decimal place is consistent with the one-decimal place standard, simplifies calculations, and will neither help nor hinder the generation of credits. The net effect of rounding the FEL to one decimal place is that some test groups may round down to the FEL, thus promoting the generation of credits. Conversely, some test groups may have to round up to the next FEL, thus potentially limiting credit generation.

3.1.5.4 Cold NMCH Credits and the Tier II Program

What Commenters Said:

ALA commented that it opposes the use of cold NMHC credits to offset deficits in compliance with any portion of the Tier II requirements.

Letters:
American Lung Association OAR-2005-0036-0365

Our Response:

With regard to cold NMHC credits, EPA does not support the use of these credits to offset Tier II compliance deficits, and in fact specifically prohibited in the proposed regulations the use of cold NMHC credits to offset any deficits other than those generated with respect to the cold NMHC standard [§86.1864-10(o)(7)(i)]. The cold NMHC and Tier 2 programs will operate independently of one another in terms of both FEL and credit determination. These provisions are not changing for the final rule, and we will therefore maintain the prohibition of using cold NMHC credits for any other program.

3.1.6 Vehicle Applicability

What Commenters Said:

Proposal Captures Appropriate Vehicles

The Alliance commented that gasoline vehicles account for the vast majority of vehicle miles traveled in the light duty fleet, and it believes that EPA has appropriately focused its 20°F standards on gasoline-fueled vehicles. The commenter noted that applying this standard to the gasoline LDV/LLDT/HLDT/MDPV vehicle classes will capture all but a very small percentage of the air toxics emissions of the light-duty on-road fleet. In addition, the commenter noted that there are restrictions on the availability of emissions testing facilities as well as a lack of current data on which to base a 20°F standard for other classes and categories of vehicles. The commenter further stated that there currently are no cold temperature test fuel specifications for diesel or for alternative fuels, nor are there any specified testing procedures established for alternative fuel vehicles. For all of these reasons, the Alliance stated that it agrees that 20°F standards should not be established for diesels and alternative fuel vehicles.

International Truck and Engine Corporation (International) commented that it supports EPA's decision not to establish cold-temperature non-methane hydrocarbon (NMHC) emissions standards for diesel vehicles. The commenter believes that such standards are unnecessary, as diesel vehicles meeting current emissions standards already have near-zero NMHC emissions as a result of recent rulemakings, and that such emissions should not increase appreciably at low temperatures.

International also commented that even when operated at low temperatures, diesel vehicles are unlikely to generate elevated hydrocarbon emissions. The commenter specifically noted that diesel particulate filters reduce hydrocarbon emissions by physically trapping them so, unlike the 3-way catalysts used in gasoline engines, there is no temperature threshold that must be reached in order for such filters to be effective in reducing NMHC emissions. The commenter stated that as a result, the substantial reductions in NMHC emissions from new diesel emissions are likely to carry over to operation at cold temperatures.

Proposal Should Apply to Additional Vehicles

ALA commented that the cold NMHC standards must be fuel-neutral. ALA believes that the following issues must be addressed: application of a cold weather hydrocarbon emissions

standard to Heavy-Duty passenger vehicles, diesel passenger vehicles, alternative fuel vehicles and flexible fuel vehicles. The commenter believes that the proposal exempts diesel, alternative fuel, and flexible fuel vehicles from the cold weather NMHC standards based on a lack of data; the commenter does not believe that EPA has presented any data to indicate whether the emissions from these vehicles are higher, lower, or the same as the gasoline vehicle subject to the proposed regulations. The commenter further stated that it believes that EPA must commit to exercising its authority to gather the needed data and establishing cold weather NMHC standards for diesel, alternative fuel vehicles and flex-fuel vehicles (FFVs) or explain why such standards are not needed; and further stated that developing standards for both these categories of vehicles should be a priority. The commenter stated that it sees no technical reason why FFVs would not be required to certify to the applicable cold NMHC standard for both E-85 and gasoline in the near future. Lastly, the commenter stated that it believes that EPA should establish cold weather standards for heavy-duty vehicles (HDVs).

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association OAR-2005-0036-0365
International Truck and Engine Corporation (International) OAR-2005-0036-0826

Our Response:

A comprehensive assessment of appropriate standards for diesel vehicles will require a significant amount of investigation and analysis of issues such as feasibility and costs. While we have significant amounts of data on which to base our final standards for light-duty gasoline vehicles, we have very little data for light-duty diesels. Currently, diesel vehicles are not subject to the cold CO standard, so there is very limited data available on diesel cold temperature emissions. Also, many manufacturers are currently in the process of developing diesel product offerings and the cold temperature performance of these vehicles cannot yet be evaluated.

There are sound engineering reasons, however, to expect cold NMHC emissions for diesel vehicles to be as low as or even lower than the finalized standards. This is because diesel engines operate with leaner air-fuel mixtures compared to gasoline engines. Therefore diesels have lower engine-out NMHC emissions due to the abundance of oxygen and more complete combustion. A very limited amount of confidential manufacturer-furnished information is consistent with this engineering hypothesis. Therefore, at this time, we are not finalizing cold NMHC standards for light-duty diesel vehicles. We will continue to evaluate data for these vehicles as they enter the fleet and will reconsider the need for standards. Specifically, we have finalized cold temperature FTP testing for diesels as part of the Fuel Economy Labeling rulemaking, including NMHC measurement.[4] These testing data will allow us to assess diesel NMHC certification levels over time. Meanwhile, postponing the promulgation of this cold temperature NMHC rule would postpone the benefits we can achieve much sooner by limiting the rule to gasoline vehicles. Therefore, the rule will not apply to diesel vehicles at this time.

[4] "Fuel Economy Labeling of Motor Vehicles; Revisions to Improve Calculation of Fuel Economy Estimates," Final Rule, 71 FR 77872, December 27, 2006.

In addition, while FFVs are currently required to certify at 20° F while operating on gasoline, there is no cold testing requirement for these vehicles while operating on the alternative fuel at 20° F. There are little data upon which to evaluate NMHC emissions when operating on alternative fuels at cold temperatures. There are also many issues that must be resolved before we are able to establish a cold temperature standard for FFVs when run on E85 (E70 at cold temperatures). These include feasibility (i.e., levels that are technically achievable), cost, test procedures, test fuel specifications and the appropriate form of the standard. For example, because much of the VOC emissions from FFVs operating on the high ethanol blends at cold temperatures is unburned ethanol on the start, we may need to consider whether higher NMHC level would be justified or whether an NMHC minus ethanol standard would have merit. Also, from a toxics perspective, FFVs operating on E85 will have a different toxics profile due to the shift in fuel from mostly gasoline composing of different compounds to mostly ethanol, a single compound.

Between the proposed rule and today's final rule, we conducted an initial emissions testing program on a limited number of FFVs operated on several blends of gasoline and ethanol at normal test temperatures and 20° F.[5] These vehicles were tested on summer gasoline and E85 under normal test temperatures and on winter gasoline and E70[6] at 20° F. At 20° F, HC emissions were significantly higher with E70 fuel than with gasoline, with the HC emissions largely consisting of unburned ethanol generated during the cold start. The reason for the elevated HC emission levels is that during cold starts, ethanol, which is an MSAT, does not readily burn in the combustion chamber due to its higher boiling point (approximately 180° F). FFVs must start on the gasoline portion of the alternative fuel, which can compose as little as 15% of the alternative fuel. Ethanol emissions are further increased at colder temperatures because the lower engine start temperature will require an increasing amount of the fuel mixture to start the vehicle and subsequently more unburned ethanol can escape the combustion process. However, the testing also indicates significantly lower benzene emission levels for FFVs when operating on the high ethanol blends. Benzene was approximately 65% lower on E85 and approximately 30% lower on E70 compared to the levels when run on gasoline. Acetaldehyde emissions are significantly higher with E85 relative to emissions from gasoline-fueled vehicles, since it is a byproduct of partial (i.e., incomplete) ethanol combustion. In addition, some other VOC-based toxics emissions were generally lower with the vehicles running on E85 and E70 compared with gasoline.

Other fuels such as methanol and natural gas pose similar uncertainty. As in the case of diesels, it will take time to gain an understanding of these other technologies in sufficient detail to support a rulemaking, which delays the benefits that may be achieved now by limiting the rule to gasoline vehicles. Therefore, as proposed, we are not finalizing a cold NMHC testing requirement for FFVs or alternative fuel vehicles under this final rulemaking. We will continue to investigate these other technologies.

Finally, as with diesel and FFVs, we lack relevant data upon which to establish a cold

[5] "Flex Fuel Vehicles (FFVs) VOC/PM Cold Temperature Characterization When Operating on Ethanol (E10, E70, E85)" February, 2007

[6] E70 is a fuel mixture consisting of 70% ethanol and 30% gasoline typical of a winter blend of an ethanol based alternative fuel.

NMHC standard HDVs. Also like diesel and FFVs, a comprehensive assessment of appropriate standards would require a significant amount of investigation and analysis. Such an investigation of HDVs would postpone the promulgation of this rule, which would postpone the benefits we can achieve much sooner by limiting the rule to gasoline LDV/LLDT/HLDT/MDPVs. Therefore, the rule will not include HDVs at this time.

3.1.7 Interim In-Use Standard

What Commenters Said:

Nissan commented that it understands and accepts EPA's desire to phase-out the interim in-use standards; however, it believes that the 0.1g/mi increment is insufficient, given the current (low) level of experience with factors influencing variability of low temperature performance. The commenter noted a study of some 77°F in-use standards which indicated that a 0.1 gpm increment may be insufficient to address possible variability during the phase-in years of this new standard. The commenter offered (as a precedent for such an increment) information regarding the LEV2-SULEV standard when it was adopted. The commenter noted that it was accepted that early implementation contains an inherent risk for misestimating factors affecting in-use variability, so the SULEV rule addressed those factors by setting a higher interim in-use standard for a limited period of time. Nissan suggests that EPA take a similar approach for this new low-temperature NMHC standard.

Nissan also commented that the finding of feasibility for the low temperature NMHC controls tends to be based, in part, on data from low odometer vehicles. The commenter believes that it may not fully reflect in-use variability at higher odometer. The commenter also stated that it believes that test data used to assess feasibility may not account for certain emerging technologies. Nissan believes that an interim in-use standard that does not accommodate these facts means that manufacturers could be inadvertently penalized for early introduction of the leading-edge and fuel-saving technology.

Nissan summarized its comments by reiterating its desire that EPA reconsider interim in-use standards and allow an increment greater than 0.1 gpm for a limited time; stating that it believes that such a targeted standard could influence the earlier implementation of the standard for some models. Nissan further stated that if manufacturers are more confident about in-use compliance, they may be able to pull-ahead some models that would otherwise be delayed because of concern over the narrow margin of the current in-use standard.

Letters:
Nissan Technical Center North America (Nissan) OAR-2005-0036-0825

Our Response:

We did not receive any data that supported Nissan's assertion, nor any indication of an acceptable increase beyond the 0.1 g/mi increment. Furthermore, no other manufacturers commented on this provision. We believe the 0.1 g/mi increment is sufficient and that anything

greater may result in a reduction of emission control. A larger increment may provide incentive for manufacturers to starting reducing their compliance margins, which is not the intent of the provision.

3.1.8 Interaction with Tier 2 Standards

What Commenters Said:

ALA commented that it is not clear whether this compliance structure will conflict or interfere with compliance of other Tier 2 standards. The ALA added that compliance and enforceability are made even more complicated by the proposal of an alternative phase-in schedule. ALA urges EPA to consider this matter more carefully before finalizing the FEL structure, and the alternative phase-in schedule in the final rule.

Letters:
American Lung Association (ALA) OAR-2005-0036-0365

Our Response:

The cold NMHC and Tier 2 programs will operate independently of one another in terms of the following: FEL determination for cold NMHC compliance, selection of compliance bins for Tier 2, credits, compliance, and enforcement. A test group's cold NMHC FEL selected by a manufacturer for the cold NMHC program will not dictate any specific Tier 2 bin for the same test group. Conversely, a manufacturer's selection of the Tier 2 bin for a test group will not determine the FEL established by the manufacturer for cold temperature standard test group. Credits earned with the ABT program for the cold NMHC program are not interchangeable with the NOx credits of the Tier 2 program. Because of the independent nature of the programs, the overlap of the Tier 2 phase-in with the cold NMHC alternative phase-in will not pose complications in terms of compliance and enforcement.

3.1.9 Intermediate Temperature Control and Determination of Defeat Devices

What Commenters Said:

The Alliance commented that the linear interpolation line used to determine emission control at ambient temperatures between 25° F and 68° F is inappropriately stringent. EPA proposed that the guideline for NMHC emission congruity across the intermediate temperature range be the linear interpolation between the NMHC FEL at 25° F and the Tier 2 NMOG standard to which the vehicle was certified at 68° F. The Alliance recommended that EPA develop the linear interpolation based on the FEL "pass limit" at 20° F, instead of the actual FEL itself.

The Alliance commented it is not appropriate to state that a "vehicle will automatically be considered to be equipped with a defeat device without further investigation" if the intermediate

temperature MHC emission level is greater than the 20° F FEL pass limit. The Alliance provided suggested modified language, and recommended that a similar modification be made for the corresponding CO language in this section.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

Based on the Alliance's comments, we have revised the regulations with respect to cold NMHC congruity at ambient temperatures between 20° F and 68° F. Instead of basing the linear interpolation on the FEL at 25° F, we will instead use the FEL "pass limit" at 20° F, per the Alliance's recommendation. For example, if a test group certifies to an FEL of 0.4 g/mi, then the linear interpolation would be based on a line drawn from the FEL pass limit of 0.449 g/mi at 20° F to the applicable Tier 2 NMOG standard at 68° F.

In addition, we have revised the language regarding the presence of a defeat device when the intermediate temperature NMHC emission level is greater than the 20° F FEL pass limit. Instead of "automatically" considering such a test result as indicative of a defeat device, the language will now read "…the vehicle will be presumed to have a defeat device unless the manufacturer provides evidence to EPA's satisfaction that the cause of the test result in question is not due to a defeat device." Though the Alliance recommended that we apply a similar change to the language regarding cold CO controls, such a revision is beyond the scope of the present rulemaking.

3.2 Evaporative Emissions Standards

3.2.1 Level/Feasibility

What Commenters Said:

ALA, in its hearing testimony, commented that it fully supports these proposed standards.

Anchorage commented that it supports the expansion and codification of standards to reduce these emissions both in ambient air and from vehicles parked in attached garages.

NYDEC commented that it is pleased that EPA has decided to modify the motor vehicle evaporative standards to harmonize with the California standards. The commenter noted that as tailpipe emissions continue to decline, evaporative emissions are an ever increasing fraction of their inventory, and a significant contributor to air toxics; it believes that full harmonization will benefit air quality, as well as benefiting motor vehicle owners and operators.

WDNR commented that it believes that all vehicles should meet the proposed evaporative standard for Light Duty Vehicles of 0.5 grams of hydrocarbon on the "3 day diurnal plus hot soak test" and 0.65 grams of hydrocarbon on the "supplemental 2 day diurnal plus hot soak test."

STAPPA and ALAPCO commented that they are disappointed that EPA did not propose to take more meaningful action to address evaporative emissions, such as nationwide adoption of California's Partial Zero-Emission Vehicle (PZEV) evaporative standards. The commenters further urged the Agency to commit in the final rule to pursue actions to achieve additional evaporative emission reductions in the future.

In addition, NESCAUM commented that California has finalized evaporative emissions standards for PZEVs that are significantly more stringent for light-duty vehicles than the federal Tier 2 standards, and the California Air Resources Board estimates that the additional per-vehicle cost for a PZEV evaporative system is approximately $10.2. The commenter believes that EPA should explore the introduction of a similar standard for some vehicles.

Also, NJDEP commented that EPA should look beyond simply the proposed harmonization of the Federal evaporative emission standards with California's standards and consider adoption of California's zero evaporative emission standards (since this harmonization would only occur for the less stringent of the LEV II program's evaporative emission standards). The commenter believes that EPA should evaluate adoption of a zero evaporative standard for federal Tier-2 certified vehicles; noting that the zero evaporative emission standard technology exists today and is being used on over 35 different models of 2006 model year vehicles certified under the LEV II program rules (Source- www.cleanvehicles.gov).

The Alliance commented that it supports the Agency's goal of aligning the federal evaporative standards with the existing LEV II evaporative standards, but noted that field data on these systems is limited, and ensuring in-use compliance with the LEV II standard over the broader range of fuels and conditions encountered nationwide will be very challenging. The commenter noted that granting additional flexibility to implement these requirements will ensure the earliest implementation of the proposed requirements; the commenter further noted that meeting the LEV II evaporative standards can be achieved more effectively if greater flexibility in the certification process is provided to manufacturers (which would allow the option to use either California or Federal test procedures for evaporative certification purposes). The commenter also stated that the ability to complete development and certification is critically dependent upon the flexibility both EPA and California provide in evaporative testing, and therefore recommends EPA allow certification compliance to LEV II standards through either Federal or California evaporative testing procedures without pre-approval.

The Alliance commented that it agrees with EPA's conclusion that it would be inappropriate to propose tighter evaporative emission standards than the LEV II standards at this time. The commenter noted that PZEVs have been limited to a small fraction of the car and light-duty truck fleet, has not been proven feasible across the light-duty fleet, it is significantly more costly to meet the PZEV evaporative emission standard due to the significant changes needed to the evaporative emission control system and the fuel system, and the emission benefits of the PZEV evaporative emission standard are minimal.

Lotus Engineering expressed that it has in its client base some very small vehicle manufacturers, with sales less than a 100 total vehicles and 50 vehicles per year in the U.S. Some of these small volume manufacturers (SVMs) want to introduce models into the 45 states

in the U.S. subject to EPA Tier 2 standards, and delay the introduction of models into the LEV II states. The difference in the Tier 2 to LEV II standards is almost a 50 percent reduction, and this difference is further exacerbated by an increased assigned deterioration factor (DF) from California -- increased stringency of 36 percent for the 2-day test and 70 percent for the 3-day test (compared to those assigned DFs from EPA).

In addition, Lotus Engineering indicated that large manufacturers have the resources to test and demonstrate their own fleet DFs. Even accepting that these fleets have both steel and plastic tanks, the large manufacturers have successfully demonstrated 0 gram DFs. The SVMs do not have this opportunity, and if the proposed harmonization of the Tier 2 and LEV II evaporative emission standards were to be established, SVMs would need a less aggressive assigned DF. SVMs should benefit from an assumption of a 0 DF unless there are technical reasons to suggest otherwise.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881
American Lung Association OAR-2005-0036-0365
Lotus Engineering OAR-2005-0036-1033
Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976
NESCAUM OAR-2005-0036-0993
New Jersey Department of Environmental Protection, Division of Air Quality (NJDEP) OAR-2005-0036-0829
New York Department of Environmental Conservation (NYDEC) OAR-2005-0036-0722
STAPPA/ALAPCO OAR-2005-0036-0836
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

Comments expressed by ALA, Anchorage, NYDEC, WDNR, and the Alliance support the adoption of the new evaporative emission standards, which harmonize with California's LEV II standards. Vehicles sold in all 50 states will now be required to meet the same numeric standard. However, we believe the LEV II standards were essentially equivalent to the current Tier 2 standards because of differences in testing requirements between the two programs (see section V.C.5 in the rule, *Existing Differences Between California and Federal Evaporative Emission Test Procedures),* and thus, vehicles contain the same evaporative emission control hardware for the two programs. (As discussed in the rule, this view is supported by manufacturers and by current industry practices.) We expect that manufacturers will continue to produce 50-state evaporative systems, and this rule will codify (i.e., lock in) the approach manufacturers have already indicated they are taking for 50-state evaporative systems.

In regard to the STAPPA/ALAPCO, NESCAUM, NJDEP, and Alliance comments related to more stringent evaporative standards (or California's PZEV evaporative emissions standards), we have decided not to set more stringent PZEV-equivalent evaporative standards at

this time. The limited PZEV vehicles available today require additional evaporative emissions technology or hardware (e.g., modifications to fuel tank and secondary canister) beyond what will be needed for vehicles meeting the new standards that we are adopting today. As we described in the proposed rule, at this time, we need to better understand the evaporative system modifications (i.e., technology, costs, lead time, etc.) potentially needed across the vehicle fleet to meet PZEV-level standards before we can fully evaluate whether it is feasible to consider more stringent standards. For example, at this point we cannot determine whether the PZEV technologies could be used fleet-wide or on only a limited set of vehicles. Thus, in the near term, we lack any of the information necessary to determine if further reductions are feasible, and if they could be achievable considering cost, energy and safety issues. Moreover, sufficient new information or data was not provided from commenters on the proposed rule to close these gaps in our understanding. However, we intend to consider more stringent evaporative emission standards in the future.

In response to the comments of Lotus Engineering, it is important to note that we are finalizing flexibility provisions for SVMs. The final rule allows SVMs a two-year delay to comply with the new evaporative standards. For a model year 2009 start date for LDVs and LLDTs, SVMs will be permitted to comply with the standards beginning in model year 2011. For a model year 2010 implementation date for HLDTs and MDPVs, SVMs will be allowed to meet the standards in model year 2012. Also, under the hardship provisions established in this rule, SVMs can apply for an additional 2 years -- beyond the above delay in the start date -- to comply with the new standards. (Before we grant hardship relief, one of the criteria is that the applicant must include evidence that the noncompliance will occur despite their best efforts.) With this extra lead time, the SVMs would be able to utilize proven evaporative emission hardware from large volume manufacturers (lowest permeation materials, etc.). In addition, it is likely that the assigned DFs will be revised before the start date of the new standards, since they are based on the 70^{th} percentile of DFs from large volume manufactures (DFs would likely decrease due to completion of phase-in of Tier 2 standards, etc.).

In addition, we support the Alliance comments to allow federal certification to the new standards through California evaporative testing results without obtaining advance approval. Since we are harmonizing federal evaporative standards with the LEV II evaporative emission standards in this rule, we believe that for the new standards it is unnecessary to continue to require this advance approval for California results. Thus, we are finalizing provisions that would allow certification to the new evaporative emission standards in accordance with California test conditions and test procedures without pre-approval from EPA.

3.2.2 Timing

What Commenters Said:

The Alliance commented that EPA must independently consider the stringency of LEV II standards relative to the emissions control capability of multi-fueled vehicles (MFVs) in setting the timetable for LEV II evaporative emissions standards for these vehicles. The commenter noted that, in addressing the timing for compliance of gasoline-fueled vehicles to California's

LEV II evaporative emissions standards, EPA based its timetable for implementing the new standards on two key factors: 1) that manufacturers already voluntarily equip federally-certified vehicles with LEV II evaporative systems hardware, so most manufacturers have experience with these systems; and 2) the Federal in-use environment may raise unique issues 'the broad range of climates and road conditions across the U.S. can potentially be more severe than in California' which necessitates unique considerations in the transition to LEV II in-use standards federally. The commenter noted that the Agency recognizes that the in-use factors are a significant factor in meeting LEV II evaporative standards over a vehicle's full useful life, and further commented that when proposing the adoption of LEV II evaporative standards for MFVs, the same two factors that guided the adoption of the standards for gasoline-fueled vehicles are critically important considerations. The commenter believes that, in this case, differences between the fuels lead to a different conclusion regarding a reasonable implementation schedule for MFVs; thus, the commenter believes that these considerations need to be addressed independently and not as an extension of adopting LEV II standards for gasoline vehicles. The commenter offered 'evidence' of these differences, noting that of the Alliance members currently marketing MFVs, only one manufacturer has any models certified for sale in California where they are subject to the LEV II evaporative standards.

The Alliance commented that for many manufacturers of MFVs, the new LEV II evaporative standards are a more stringent requirement being contemplated for these vehicles for the first time, unlike gasoline vehicles in which case it is not EPA's intention to impose additional stringency but rather to codify what is already in place. The commenter noted that for most manufacturers of MFVs, there is currently no demonstrated capability to meet the LEV II evaporative certification standard from which to begin planning compliance to the standard. The commenter stated that it believes that this alters the starting point for EPA's rulemaking, as applicable to MFVs, relative to the starting point for regulating gasoline vehicle evaporative emissions (where existing systems demonstrate capability to meet the LEV II evaporative certification standard). The commenter stated that it believes that this alone justifies a separate timetable for adopting the lower LEV II evaporative standards for MFVs, which it noted that the Agency recognized in the proposal. The commenter noted, however, that as interest in alternative fuels heightens due to energy supply issues, manufacturers are suddenly contemplating widespread introduction of flexible fuel models across entire product lines. The commenter believes that these new developments justify reconsideration by the Agency of the general lead-time requirements.

In particular, the Alliance requests the following revisions to the proposed LEV II evaporative standards for MFVs (*See docket number 0881.1, p. 30 for Table 2: Proposed Phase-in Schedule for LEV II Evaporative Standards for Multi-Fueled Vehicles by Model Year*):

1. Combine the LDV/LLDT and HLDT/MDPV fleets for the purposes of compliance planning flexibility.
2. Implement a phase-in of this combined fleet to the LEV II evaporative standard beginning in 2013.
3. Allow a 3-year phase-in of 30/60/100% based on the combined fleet.

The Alliance provided the following technical rationale:

1. Under the current proposal, 2012 will see an implementation of the LEV II evaporative in-use standards for gasoline models, using lessons learned from field experience gained on systems certified to the LEV II standards from 2009 for LDVs/LLDTs and 2010 for HLDTs/MDPVs. The commenter believes that these in-use lessons learned can be applied to the MFV product beginning the next model year, to the extent they apply; where MFV evaporative emission control systems must be robust enough to control hydrocarbon emissions to near-zero levels from fuels ranging from zero to 85% ethanol, there can be overlap between operating conditions and consequently some similarity of field data. This field data can be leveraged, and this encourages a seamless progression of the LEV II evaporative certification and in-use standards from gasoline vehicles in 2012 to MFVs in 2013.

2. The commenter stated that model renewals provide the most cost-effective and advantageous timing for introduction of new emissions capability to meet LEV II evaporative standards. The commenter noted that some manufacturers currently plan model renewals for multiple vehicle lines in the window of the three model years from 2013 to 2015. The commenter believes that providing a 3-year phase-in for MFVs provides greater opportunities for scheduled model renewals to coincide with implementation points for LEV II evaporative standards for these vehicles; planning, engineering, and development activities necessary to comply with these new standards can be incorporated into the model redesign activities.

3. The commenter stated that it believes that combining the LDV/LLDT fleet with the HLDT/MDPV fleet for the purpose of complying with the phase-in requirements of this new standard for MFVs gives manufacturers greater flexibility in managing the timing of any necessary redesigns of evaporative emission control system architecture and technology. The commenter noted that more product lines would be in the pool of vehicles requiring phase-in, which would allow more choice in how to stage the phase-in. The commenter believes this is especially important if manufacturers opt to take advantage of certification to LEV II evaporative standards to offer an MFV package as a 50-state package, which must then also simultaneously satisfy California's LEV II exhaust emission standards and the additional complexity of NMOG compliance plans, which are sales-volume based.

4. The commenter stated that it believes that a 3-year phase-in to the LEV II evaporative standards for MFVs will allow better application of in-use experience gained on those packages phased-in earlier to those packages phased-in later-- thereby shortening the overall timetable for full implementation of the new standards relative to what would otherwise be necessary.

The Alliance commented that the MFV portion of the light-duty on-road fleet is currently a small fraction of the total light-duty fleet, and that while this is expected to increase, it is still projected to be a small fraction through the proposed phase-in period. The commenter stated that it believes that the incremental effect of providing a 3-year phase-in of MFV LEV II evaporative standards will not materially affect the contribution of the light-duty fleet to the air toxics inventories.

Letters:
Alliance of Automobile Manufacturers (Alliance) OAR-2005-0036-0881

Our Response:

We believe that many of the concerns expressed by manufacturers supporting additional lead time for MFVs are valid. Most manufacturers have less experience meeting the new standards on the non-gasoline portion of MFVs (or FFVs) compared to gasoline vehicles. Different from what we proposed, the new standards will apply beginning in model year 2012 with a three-year phase-in, 30/60/100 percent, for LDVs/LLDTs and HLDTs/MDPVs grouped together (see the below table for the phase-in schedule). Although auto manufacturers requested a start date of 2013 for a combined fleet, we believe the additional flexibilities we are providing (three-year phase-in and grouping LDVs/LLDTs and HLDTs/MDPVs together) is sufficient flexibility for the production of MFVs. There is enough time between now and the implementation dates or phase-in schedule (2012 through 2014) for manufacturers to coordinate model renewals with the introduction of broader product offerings of MFVs.

Phase-in Schedule for Non-Gasoline Portion of MFVs: Evaporative Emission Standards*

Vehicle GVWR (Category)	2012	2013	2014
≤ 6000 lbs (LDVs/LLDTs) and > 6000lbs (HLDTs and MDPVs)	30%	60%	100%

*Phase-in schedules are grouped together for LDVs/LLDTs and HLDTs/MDPVs.

As described in section V.C.4 of the rulemaking (*In-Use Evaporative Emission Standards*), the existing Tier 2 evaporative emission standards will apply in-use for the first three model years after an evaporative family is first certified to the new standards, but similar interim in-use provisions will not apply to the non-gasoline portion of MFVs. We believe that three to five additional years to prepare vehicles (or evaporative families) to meet the certification standards, and to simultaneously make vehicle adjustments from the federal in-use experience of other vehicles (including those that are not MFVs) is sufficient to resolve any issues for MFVs. Therefore, according to the phase-in schedule above for a combined fleet (for non-gasoline portion of MFVs), the evaporative emission standards will apply both for certification and in-use beginning in 2012 for LDVs/LLDTs and HLDTs/MDPVs.

3.2.3 Other

3.2.3.1 On-Board Diagnostics and Evaporative Emissions Standards

What Commenters Said:

WDNR questioned whether or not, with regard to evaporative emissions standards, vehicles with On-Board Diagnostic II (OBD II) systems would require recalibration by the

manufacturer of the evaporative monitor in the OBD II system to ensure that the evaporative emission standards that are chosen in adopted rule are met. The commenter also questioned whether or not manufacturers would have some identification for the new vehicles that meet the standard, noting that individual State and local agencies will not have the capability to identify these new certified vehicles in an OBD II emissions testing program. In addition, the commenter asked how the use of ethanol added fuel (E10 or E85) would affect the certified recalibration standard for the evaporative monitor in the OBD II system in new vehicles.

Letters:
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

We believe some additional context is needed in regard to OBD II requirements. OBD II monitors for vapor leaks (0.040 inches or 1 millimeter is the EPA leak monitor requirement; a vacuum or pressure check of the evaporative system is performed to test for leaks) and equipment malfunctions of the evaporative emissions system. Therefore, the OBD II system would not have to be recalibrated for the new evaporative emission standards. Moreover, the OBD II system will operate the same regardless of fuel type, and thus, E10 or E85 fuels (E10 is fuel that is 10 percent ethanol and 90 percent gasoline, and E85 is fuel that is 85 percent ethanol and 15 percent gasoline) will not impact the OBD II system monitoring for evaporative emission leaks. As for identification of the new vehicles meeting the promulgated standards, we have a vehicle certification database on EPA's website at www.epa.gov/cfeis.htm, and in this database the public would be able to identify the evaporative emissions data for new vehicles. (This database includes a document index system (DIS), and it contains a summary of the certification test data on a report, which is commonly called the "summary sheet.")

3.2.3.2 Compliance During Phase-in Period

What Commenters Said:

WDNR questioned who will be responsible for ensuring that the standards are being complied with during the phase-in.

Letters:
Wisconsin Department of Natural Resources, Bureau of Air Management (WDNR) OAR-2005-0036-0828

Our Response:

EPA has compliance and enforcement staff that are responsible for ensuring that manufacturers meet the standards according to the phase-in schedules. In addition, manufacturers are required to perform in-use, 2-day evaporative emission tests on one low-mileage vehicle and one high-mileage vehicle in each certified evaporative family. (Low-

mileage vehicles are typically one year old with approximately 10,000 to 20,000 miles. High-mileage vehicles are typically three to four years old with a minimum of 50,000 miles.)

3.2.3.3 Cold-temperature Testing for Compliance Assurance

What Commenters Said:

Anchorage recommended cold-temperature testing of running and evaporative emissions to ensure controls are working as designed.

Letters:
Municipality of Anchorage, Department of Health and Human Services (Anchorage) OAR-2005-0036-0976

Our Response:

It is important to note that evaporative emissions are much less at cold temperatures. EPA's evaporative emission test procedures correspond to in-use vehicle operation in ozone-prone summertime conditions -- hot weather (March 24, 1993; 58 FR 16002). See also section 202(k) of the Clean Air Act – *Evaporative Emissions*.