

technologies, we believe the market will determine if and when the territories will make the investment needed to obtain and distribute the diesel fuel necessary to support these technologies.

We are also requiring that all nonroad diesel engines and equipment for these territories be certified and labeled to the applicable requirements—either to the previous-tier standards and associated requirements under this exclusion, or to the Tier 4 standards and associated requirements applicable for the model year of production under the nationwide requirements of today's action. The engines would still be emissions warranted, as otherwise required under the CAA and EPA regulations. Special recall and warranty considerations due to the use of excluded high sulfur fuel would be the same as those for Alaska during its exemption and transition periods for highway diesel fuel and for these territories for highway diesel fuel (see 66 FR 5086, 5088, January 18, 2001).

To protect against circumvention of the emission requirements applicable to the rest of the U.S., we are restricting the importation of nonroad engines and equipment from these territories into the rest of the U.S. After the 2010 model year, nonroad diesel engines and equipment certified under this exclusion for sale in American Samoa, Guam and the Commonwealth of the Northern Mariana Islands will not be permitted entry into the rest of the U.S.

b. Why Are We Treating These Territories Uniquely?

Like Alaska, these territories are currently exempt from the 500 ppm sulfur standard for highway diesel fuel. Unlike Alaska, they are also exempt from the new highway diesel fuel sulfur standard effective in 2006 and the new highway vehicle and engine emission standards effective beginning in 2007 (see 66 FR 5088, January 18, 2001).

Section 325 of the CAA provides that upon request of Guam, American Samoa, the Virgin Islands, or the Commonwealth of the Northern Mariana Islands, we may exempt any person or source, or class of persons or sources, in that territory from any requirement of the CAA, with some specific exceptions. The requested exemption could be granted if we determine that compliance with such requirement is not feasible or is unreasonable due to unique geographical, meteorological, or economic factors of the territory, or other local factors as we consider significant. Prior to the effective date of the current highway diesel fuel sulfur standard of 500 ppm, the territories of American Samoa, Guam and the

Commonwealth of the Northern Mariana Islands petitioned us for an exemption under section 325 of the CAA from the sulfur requirement under section 211(i) of the CAA and associated regulations at 40 CFR 80.29. We subsequently granted the petitions.¹⁰⁷ Consistent with this decision, in our January 18, 2001 highway rule (66 FR 5088), we determined that the 2007 heavy-duty engine emission standards and 2006 diesel fuel sulfur standard would not apply to these territories.

Compliance with the NRLM diesel fuel sulfur standards would result in major economic burden on the territories. All three of these territories lack internal petroleum supplies and refining capabilities and rely on long distance imports. Given their remote location from Hawaii and the U.S. mainland, most petroleum products are imported from east rim nations, particularly Singapore, Australia, the Philippines, and certain other Asian countries are beginning to consider and in some cases implement lower sulfur diesel fuel standards. However, it is not clear that supply, especially of 15 ppm sulfur diesel fuel, would be possible to these territories.

Furthermore, compliance with new 15 ppm sulfur requirement for highway diesel fuel beginning in 2006 and today's 15 ppm sulfur requirement for NRLM diesel fuel beginning in 2010 (or the 500 ppm sulfur requirement for NRLM diesel fuel beginning 2007) would require construction of separate storage and handling facilities for a unique grade of diesel fuel for highway and nonroad purposes, or use of 15 ppm sulfur diesel fuel for all diesel applications to avoid segregation. Either of these alternatives would require importation of 500 and 15 ppm sulfur diesel fuel from Hawaii or the U.S. mainland, and would significantly add to the already high cost of diesel fuel in these territories, which rely heavily on U.S. support for their economies. At the same time, it is not clear that the environmental benefits in these areas would warrant this cost. Therefore, we are not applying the fuel and engine standards to these territories.

The Caribbean Petroleum Corporation (CPC) commented that the proposed nonroad diesel rule would result in a major economic burden for Puerto Rico, the environmental benefits do not warrant the cost, and that Puerto Rico should be exempt. However, the CPC did not include any cost or environmental information to support

its claims. We have no reason to believe that the costs of the NRLM diesel fuel program in Puerto Rico will be significantly greater than that of the U.S. For example, Puerto Rico is close to the U.S. mainland, and to South American and Central American suppliers of fuel to the U.S. mainland, and therefore has ready access to nearby fuel supplies that meet U.S. requirements. Similar to the fuel distribution system in the rest of the country, the fuel distribution system in Puerto Rico is geared to separate fuel handling and storage facilities for highway and non-highway diesel fuels. Today's rule will require additional segregation for the NRLM diesel fuels, but no differently for Puerto Rico than for the U.S. Nevertheless, to avoid that additional fuel segregation, Puerto Rico could substitute highway fuel for use in NRLM diesel engines and equipment. We also believe that the important air quality benefits to be realized by today's rule for the four million people in Puerto Rico should not be significantly different than those for the rest of the country. Consequently, today's rule includes Puerto Rico in the NRLM diesel fuel program.

D. NRLM Diesel Fuel Program Design

In addition to specifying the sulfur standards and the implementation dates when the standards take effect, the diesel fuel program compliance provisions must be designed and structured carefully to achieve the overall principles of the program. Specifically, the health and welfare benefits of the NRLM diesel fuel and the highway diesel programs, and the need for widespread availability of 15 ppm sulfur highway diesel fuel must be maintained. The program benefits and fuel availability will only happen if the NRLM diesel fuel program is designed such that the amount of 15 ppm sulfur fuel expected to be produced under the highway diesel fuel program is in fact produced and that 500 ppm highway fuel is not overproduced. Likewise, the benefits of the NRLM diesel fuel sulfur standards adopted today will only be achieved if the program is designed to ensure that the volume of diesel fuel consumed by NRLM diesel engines is matched by the supply of NRLM diesel fuel produced to the appropriate low sulfur levels. At the same time, promoting the efficiency of the distribution system calls for fungible products, and minimizing the need for product segregation.

As discussed below, the situation faced in 1993 when EPA first regulated the sulfur content of highway diesel fuel parallels some of the issues that EPA

¹⁰⁷ See 57 FR 32010, July 20, 1992 for American Samoa; 57 FR 32010, July 30, 1992 for Guam; and 59 FR 26129, May 19, 1994 for CNMI.

needed to address in today's rule. Prior to the implementation of the 500 ppm sulfur standard for highway diesel fuel in 1993, most No. 2 distillate fuel was produced to essentially the same specifications, shipped fungibly, and used interchangeably by highway diesel engines, nonroad diesel engines, locomotive and marine diesel engines, and heating oil applications. Beginning in 1993, highway diesel fuel was required to meet a 500 ppm sulfur cap and was segregated from other distillate fuels as it left the refinery by the use of a visible level of dye solvent red 164 in all non-highway distillate. At about the same time, the Internal Revenue Service (IRS) similarly required non-highway diesel fuel to be dyed red to a much higher concentration prior to retail sale to distinguish it from highway diesel fuel for excise tax purposes. Dyed non-highway fuel is exempt from this tax. This splitting of the distillate pool necessitated changes in the distribution system to ship and store the now distinct products separately. In some parts of the country where the costs to segregate non-highway diesel fuel from highway diesel fuel could not be justified, both fuels have been produced to highway specifications.¹⁰⁸

1. Requirements During the First Step of the Fuel Program

EPA is adopting specific compliance provisions during the first step of today's NRLM diesel fuel sulfur control program for three reasons. The first is to maintain the integrity of the highway diesel program, while allowing the efficient distribution of highway and NRLM diesel fuel. Since 500 ppm sulfur highway diesel fuel allowed under the highway diesel fuel program's Temporary Compliance Option (TCO) and NRLM diesel fuel meeting today's 500 ppm sulfur standard will be physically the same, it would be impossible to maintain the benefits and program integrity of the highway diesel fuel program without some means of differentiating highway diesel fuel from NRLM diesel fuel.

Continuing the current practice of dyeing NRLM diesel fuel at the refinery gate and requiring that it be segregated throughout the distribution system is not a practical way to differentiate NRLM diesel fuel from highway fuel. At the same time, allowing the unrestricted

fungible distribution of highway and NRLM diesel fuel with the same sulfur level risks the loss of important benefits of the highway program. For example, if a refiner produced all 500 ppm sulfur fuel and designated it as NRLM diesel fuel, that refiner would have no obligation to produce any 15 ppm sulfur highway diesel fuel. Without an effective way of limiting the use in the highway market of 500 ppm sulfur diesel fuel produced as NRLM diesel fuel, much more 500 ppm sulfur fuel could, and likely would find its way into the highway market than would otherwise happen under the current highway program. This would displace 15 ppm sulfur diesel fuel that would have otherwise been produced. This likely series of events would circumvent the intent of the highway program's TCO and sacrifice some of the resulting PM and SO₂ emission benefits of the overall highway diesel program. If this occurred to any significant degree, it could also undermine the integrity of the highway program by threatening the availability of 15 ppm sulfur diesel fuel nationwide for the vehicles that need it. This is no longer a concern after 2010, when all highway diesel fuel is required to meet a 15 ppm sulfur standard.

The second reason is to maintain the integrity of the NRLM diesel fuel program, while allowing the efficient distribution of NRLM diesel fuel and heating oil where they have similar sulfur levels. By establishing new sulfur standards for NRLM diesel fuel but not heating oil, today's program creates the need to distinguish the fuel used for these two purposes. Currently, there is no grade of diesel fuel which is produced and marketed as a distinguishable grade for NRLM diesel engine uses. It is typically produced and shipped fungibly with other distillate used for heating oil purposes, and it is all dyed red in accordance with EPA and IRS regulations. Because today's rule includes small refiner and credit provisions that allow the limited production of high sulfur (greater than 500 ppm) NRLM diesel fuel through 2010, it is not possible to rely on sulfur content alone to differentiate NRLM diesel fuel from heating oil during the first step of the program. Without adequate controls, a refiner could choose not to desulfurize any of its fuel that is destined for the NRLM diesel fuel market, instead designating that volume as heating oil at the refinery gate. This fuel, ostensibly manufactured for use as heating oil could be misdirected for use in NRLM diesel equipment, and would be indistinguishable from legal high sulfur NRLM diesel fuel produced by

small refiners and/or through the use of credits. This could substantially reduce the environmental benefits of today's rule.

After 2010, when the 15 ppm sulfur standard for NR diesel fuel goes into effect, small refiner and credit NR fuel must meet a 500 ppm standard. Therefore, after 2010 NRLM diesel fuel can be distinguished from high sulfur (greater than 500 ppm) home heating fuel based on sulfur content. However, 500 ppm NR (small refiner, credit) produced from June 1, 2010 through May 31, 2012, and 500 ppm NRLM (small refiner, credit) diesel fuel produced from June 1, 2012 through May 31, 2014, could not be distinguished from heating oil produced to meet a similar 500 ppm sulfur limit. Likewise, from June 1, 2010 to June 1, 2012, 500 ppm NR (small refiner, credit) diesel fuel and LM diesel fuel need to be distinguished from each other, so that diesel fuel produced as 500 ppm LM is not later misdirected to the NR diesel market. Such misdirected 500 ppm sulfur LM diesel fuel would be indistinguishable from legal 500 ppm sulfur NR diesel fuel, reducing the environmental benefits of today's rule. These various 500 ppm fuels could not be distinguished based on sulfur level. As previously discussed, the situation which was faced in 1993 regarding the need to differentiate 500 ppm sulfur highway diesel fuel from other diesel fuel is similar to the need today to differentiate highway diesel fuel, NRLM diesel fuel, and heating oil.

The third reason is to maintain the integrity of the anti-downgrading requirements in the highway diesel program. The highway diesel program requires that each entity in the distribution system downgrade no more than 20 percent of the 15 ppm sulfur highway diesel fuel for which it assumes custody to 500 ppm sulfur highway diesel fuel. These provisions are necessary to ensure the widespread availability of 15 ppm sulfur diesel fuel for use in model year 2007 and later highway vehicles, in which the use of 15 ppm sulfur fuel is essential to facilitate the projected emissions benefits of the highway program. The highway program placed no restrictions on the volume of highway diesel fuel that could be downgraded to NRLM diesel fuel. Under the proposed rule there would be no way to distinguish 500 ppm sulfur NRLM diesel fuel from 500 ppm sulfur highway diesel fuel downstream of the refinery. Therefore, to preserve the integrity of the highway program, the proposal would have made the highway program's anti-downgrade requirements more stringent by also

¹⁰⁸ Diesel fuel produced to highway specifications but used for non-highway purposes is referred to as "spill-over." It leaves the refinery gate and is fungibly distributed as if it were highway diesel fuel, and is typically dyed at a point later in the distribution system. Once it is dyed it is no longer available for use in highway vehicles, and is not part of the supply of highway fuel.

restricting downgrades to 500 ppm sulfur NRLM diesel fuel. We received several negative comments on this proposed restriction. The compliance and record keeping requirements finalized to address the two concerns discussed above, can be utilized to facilitate the implementation of the highway program's anti-downgrading requirements without the need to further restrict downgrading. As a result, today's rule also contains several modifications which clarify the anti-downgrading provisions of the highway diesel program.

The requirements described below will help ensure that the projected benefits of the highway diesel program and of today's NRLM diesel program are achieved.

a. Ensuring Refiner Production Volumes of 15 ppm Sulfur Highway Diesel Fuel Are Consistent With the Highway Rule's 80/20 Requirement

To avoid adding unnecessary cost to the fuel distribution system, we proposed that the current requirement of dyeing non-highway distillate fuels at the refinery gate become voluntary as of June 1, 2006.¹⁰⁹ As discussed in the proposal, continuing to require that NRLM diesel fuel and heating oil contain a visible trace of red dye at the refinery gate would allow for simple enforcement of the highway standards throughout the duration of the highway program's TCO. Clear, undyed diesel fuel would have to meet the 80/20 ratio of 15 ppm to 500 ppm sulfur highway diesel fuel, and dyed fuel could only be used in NRLM diesel equipment or as heating oil. Continuing the current dye provisions would therefore ensure that the intended benefits of the highway program are achieved. However, maintaining this dye distinction would also require segregation of a new grade of dyed 500 ppm sulfur NRLM diesel fuel throughout the entire distribution system. The costs of requiring segregation of two otherwise identical fuels throughout the entire distribution system could be quite substantial.¹¹⁰ Comments on the proposed rule confirmed EPA's assessment that the ability of the fuel distribution system to distribute these fuels fungibly is

essential, since segregating the fuels could result in substantial additional transportation costs and necessitate additional storage tanks throughout the system.

The NPRM invited comment on two alternative approaches to ensure that refiner production of 15 ppm sulfur highway diesel fuel met the highway rule's 80/20 requirement; the "refiner baseline" approach, and the "designate and track" approach. The baseline approach is essentially a constraint on the sulfur levels of the various distillate fuel products a refiner produces, based on historical production volumes. Fuel with similar sulfur levels could then be fungibly distributed with only limited controls on the downstream distribution system. The designate and track approach requires that a refiner designate into which market discrete volumes of the distillate fuels it produces must be sold, without any consideration of historical production volumes. The fuel must then be tracked through the distribution system and sold only for its designated purpose (or a purpose that requires less control). As with the baseline approach, diesel fuel with similar sulfur levels could be fungibly shipped up to the point of distribution from a terminal where off-highway diesel fuel must be dyed red pursuant to IRS requirements to indicate its tax exempt status.

We proposed the baseline approach because, in the absence of a red dye requirement at the refinery-gate for NRLM diesel fuel, we expected that it would: (1) Allow for the fungible distribution of 500 ppm sulfur highway and NRLM diesel fuel; (2) ensure the enforceability of the highway diesel fuel and NRLM diesel fuel standards; (3) maintain the projected production volume of 15 ppm sulfur highway diesel fuel; (4) allow refiner production of 500 ppm sulfur NRLM diesel fuel and heating oil to remain flexible to meet market demand; and (5) enable the efficient distribution of diesel fuel while imposing the least burden on the parties in the fuel production and distribution system. In the proposal, we also discussed how a refiner's baseline would be set, and invited comment on ways to account for changes refiners might make from their historical production practices in response to the highway diesel program.

In the NPRM, we expressed concerns that a designate and track approach would raise significant workability and enforceability issues and therefore might not maintain the integrity of highway and NRLM diesel fuel sulfur programs. Our concerns about the workability and enforceability of a

designate and track approach amplified potential concerns regarding whether the approach might reduce the volume of 15 ppm sulfur diesel fuel required to be produced under the highway diesel program, leading to a reduction in the environmental benefits of the highway diesel program and calling into question the availability of 15 ppm sulfur diesel fuel. We were also concerned about whether this approach would place too much burden on the numerous entities in the fuel distribution system, as compliance was focused on downstream parties. While the designate and track approach provided greater production flexibility to refiners than the baseline approach, it appeared to increase the burden and restrictions on downstream parties.

Of the approaches discussed in the NPRM, we expected that the baseline approach would provide the best mechanism to achieve the fuel program goals described at the beginning of this section. Since the proposal, we have comprehensively evaluated the advantages and disadvantages of both approaches. Based on this review, we now believe that a baseline approach would produce significant adverse problems because of its overly restrictive impact on the ability of fuel producers and distributors to efficiently respond to the myriad and daily needs of the markets for highway and NRLM diesel fuel. Implementation of the approach could also produce an unintended bias that would tend to reduce the benefits of the highway program and reduce the availability of 15 ppm sulfur highway diesel fuel. At the same time, our review of the approaches shows that the designate and track approach can be implemented in an enforceable manner and likely would not cause a reduction in the environmental benefits of the highway diesel program or adversely impact the widespread availability of 15 ppm sulfur highway diesel fuel. Our evaluation of these alternate approaches is discussed in more detail in the following sections.

i. Proposed Refiner Baseline Approach

Under the refiner baseline approach, we proposed that from June 1, 2007 through May 31, 2010, any refiner or importer could choose to distribute its 500 ppm sulfur NRLM and highway diesel fuels fungibly without adding red dye at the refinery gate. Refiners and importers who elect to distribute these fuels fungibly would need to establish a non-highway distillate baseline, defined as a percentage of its total distillate fuel production volume based on historical production data. For future production

¹⁰⁹ The IRS requirements concerning dyeing of non-highway fuel prior to sale to consumers are not changed by this rulemaking.

¹¹⁰ Under the highway program the potential exists to add a third grade of diesel fuel in an estimated 40 percent of the country, and we projected one-time tankage and distribution system costs of \$1.05 billion to accomplish this. Using similar assumptions, to add a second 500 ppm grade nationwide would cost in excess of \$2 billion. This assumes that the capability exists to add such new tankage.

purposes, this percentage of the volume of diesel fuel produced would have to either meet the 500 ppm sulfur NRLM diesel fuel sulfur standard or be marked as heating oil. All the remaining production of diesel fuel would have to meet the requirements of the highway fuel program (*i.e.*, 80 percent of this fuel would have to meet a 15 ppm sulfur cap). Refiners not wishing to participate in the baseline approach would have to dye all of their 500 ppm sulfur NRLM diesel fuel at the refinery. However, we anticipated that few refiners would opt to dye 500 ppm sulfur NRLM diesel fuel, other than the volumes that they dispense from their own racks, since this would eliminate the ability to fungibly distribute 500 ppm sulfur highway and NRLM diesel fuels.

Since the publication of the proposed rule, we have developed a better understanding of refiner concerns about the constraints associated with the baseline approach. Specifically, it is now clear that individual refiners would be significantly constrained by the baseline approach from efficiently responding to changes in contract arrangements with their clients and changes in market demands. Refiners commented that they win and lose contracts on a daily basis and that depending on which contracts they secure, they may not be able to comply with their baseline. Specific concerns were raised regarding the ability of refiners to compensate for the loss of export contracts and to respond to spikes in the demand for heating oil which periodically result from an unexpectedly cold winter. Refiners also related that the constraints under the baseline approach could cause an anti-competitive dynamic between fuel refiners and their customers.

Based on our reevaluation of the baseline approach and the information gathered from the public comments, it is now clear that the constraints on the slate of fuels that a refiner produces under the baseline approach could interfere with a refiner's ability to meet market demands, which in turn could result in supply shortages and increased fuel prices. For example, if a refiner were to lose an export contract for high sulfur diesel fuel, the baseline approach could prevent that refiner from seeking to market that product domestically. This could impact the overall supply of diesel fuel since the refiner may not have sufficient facilities to desulfurize diesel fuel. Also, knowing that losing such an export contract would leave the refiner with no ability to market its fuel domestically could give the refiner's export client an undue advantage during contract negotiations.

In the case of a spike in heating oil demand due to an unusually cold winter, the baseline approach would limit a refiner's ability to produce additional volumes of high sulfur distillate fuel beyond the volume established under its baseline. Refiners that were limited in their ability to produce additional high sulfur fuel could choose to supply low sulfur diesel fuel to the heating oil market. However, they may not have sufficient hydrotreating capacity to do so. This could limit their ability to respond to a supply shortage.

The proposed rule suggested various potential modifications to the baseline approach to address refiner concerns regarding the associated constraints on the slate of fuels they produce. We received comments on the potential modifications discussed in the NPRM as well as other potential changes to the baseline approach. Some commenters suggested that if EPA were to finalize a baseline approach, refiners should be able to apply to EPA for a yearly adjustment to their baseline based on annual demand forecasts. Even with such flexibility, refiners still concluded that in many cases they would likely be forced to dye their fuel instead. For fuel distributors, having refiners dye their NRLM diesel fuel presented an unacceptable situation due to the need to distribute another grade of fuel. As a result, all comments from the refining and fuel distribution community were in agreement that the baseline approach may be unworkable.

Based on our review of the comments and our discussions with fuel producers and distributors, it has become clear that none of the potential modifications to the baseline approach would adequately compensate for the inherent inflexibility of requiring refiners to comply with set production ratios. Even if EPA were to adjust such ratios on an annual basis, refiners might need to approach EPA for an interim adjustment if their contractual agreements changed or if market demand shifted unexpectedly. The process of evaluating requests for baseline adjustments could be very burdensome to the industry and to EPA, and EPA would unlikely be able to respond quickly enough to changing market conditions.

More importantly, all of the potential alternatives that we might implement to mitigate the constraints of the baseline approach could potentially undermine the environmental benefits of the highway program. Such alternatives all would involve granting allowances to some refiners to produce additional volumes of non-highway fuels above the set baseline to facilitate a refiner

meeting the market demand for such fuels. At the same time, it would not be possible for EPA to reduce the ability of other refiners to produce non-highway fuel who may have lost these markets. Therefore, for such alternatives to be effective in responding to changing market conditions, an unintended downward bias would result regarding the required production of 15 ppm sulfur highway diesel fuel.

Even without any changes we discovered from the highway diesel program pre-compliance reports that the proposed baseline approach has a downward bias that could result in a reduction in the volume of 15 ppm sulfur diesel fuel produced under the highway diesel program.¹¹¹ We proposed that refiners could choose to calculate their off-highway baseline using either an average of 2003 through 2005 production data or 2006 production data. Providing the option for a 2006 baseline was necessary because a number of refiners will be changing the slate of fuels that they produce in response to the highway diesel rule which becomes effective in 2006. While the highway diesel pre-compliance reports indicate an overall increase in production volume, they also indicate that 40 percent of highway diesel refiners will decrease the volume of highway diesel fuel they produce. If all of these refiners were to take a 2006 baseline to determine the volume of 15 ppm sulfur diesel fuel they would be required to produce, a substantial drop in the total volume of 15 ppm sulfur diesel fuel produced could result.

The pre-compliance reports indicate that the other 60 percent of refiners will be increasing the volume of highway diesel fuel they produce. We projected that these shifts in the slate of fuel products that refiners produce would have an overall positive impact on diesel fuel supply. However, refiners that increase the volume of highway fuel they produce would likely chose to calculate their baseline using their lower 2003–2005 production volumes. Doing so would result in a lower percentage of their distillate fuel that would be required to be produced for highway diesel use, and subject to a 15 ppm sulfur standard.

The volume of spillover could also be reduced if refiners were to dye 500 ppm sulfur diesel fuel manufactured to meet anticipated NRLM diesel fuel demand in order to avoid needing to comply with the baseline approach. Many refiners commented that they

¹¹¹ "Summary and Analysis of the Highway Diesel Fuel 2003 Pre-compliance Reports," EPA 420-R-03-103, October 2003.

considered the baseline approach so unworkable and onerous that they would choose to dye all of their 500 ppm sulfur NRLM diesel fuel at the refinery gate. This could force some parts of the distribution systems which had previously not carried two grades of diesel fuel for highway and off-highway uses to begin doing so.

In summary, we are not finalizing the proposed baseline system because we believe—

1. It could unnecessarily constrain refiners ability to meet market demands, encouraging them to dye 500 ppm sulfur NRLM diesel fuel at the refinery resulting in an added burden to the distribution system;

2. It could create a bias that could result in a loss in the volume of 15 ppm sulfur highway diesel fuel produced, and the options to remove these market constraints would only increase the bias to reduce the volume of 15 ppm sulfur highway diesel fuel; and

3. The baseline approach would not ensure that the environmental benefits of the 2007 highway diesel program would be maintained.

ii. Designate and Track Approach

At the time of the NPRM, we invited comment on an alternative to the baseline approach called the “designate and track” approach. Under the envisioned designate and track approach, refiners and importers would designate the volumes of 500 ppm sulfur diesel fuel they produce/import as either highway or NRLM diesel fuel and would ship them fungibly. These designations would follow the fuel through the distribution system and be used to restrict the sale of 500 ppm sulfur NRLM diesel fuel from the highway market. While we sought comment on various forms of the designate and track approach, we also expressed serious reservations regarding its workability, enforceability, impact on the benefits of the highway rule, and constraints on the distribution system. For example, at the time of the proposal, refiners supported a designate and track approach where certain parts of the distribution system (e.g., pipelines) did not have to report. EPA believed that such an approach was unenforceable. Refiners were also supporting the designate and track approach as an option for refiners to choose in addition to the baseline approach. However, EPA believed that the two approaches were incompatible.

As noted in the proposal, the designate and track approach allows maximum flexibility for refiners and importers, but EPA had concerns that the volume reconciliation requirements

would inappropriately restrict the flexibility of downstream parties to respond to market changes. EPA also had concerns that it would reduce the amount of 15 ppm spillover from the highway market, reducing the environmental benefits of that rule.

Since the proposal, we received extensive input both in the written comments and through in-depth meetings with representatives of all segments of the fuel distribution industry on how the designate and track system might be structured to provide the needed compliance oversight without placing an undue burden on industry. Refiners now agree that the designate and track approach should not be an option for refiners in addition to the baseline approach, and support it as a stand alone approach. All parties in the fuel distribution system have also now expressed support for the record keeping and reporting requirements associated with tracking designated fuel volumes through each custodian in the distribution chain until the fuel leaves the terminal either taxed or dyed. Furthermore, commenters from all segments of the fuel distribution industry from the refiner through to the terminal stated that the information needed to support the designate and track approach is already kept as part of normal business practices. Commenters stated that only modest upgrades in their record keeping procedures would be needed to compile the needed information and that preparing the necessary reports would not represent a significant burden. Thus, our concerns that a designate and track approach might represent a large burden to fuel distributors were unfounded.

In addition, we have developed appropriate solutions to the various open questions and issues that we had with the designate and track approach at the time of the proposal. In the proposal it was unclear how a designate and track approach would be structured to account for the swell in highway diesel fuel volumes in the winter that results from downstream kerosene blending to improve cold flow properties. Without an adequate control mechanism, normal swell in downstream highway diesel fuel volumes in the North due to kerosene blending during winter months could mask the inappropriate shifting of NRLM-designated 500 ppm sulfur fuel to the highway diesel pool. We have developed an appropriate mechanism to address this situation as described in section IV.D.3.

In the proposal, we also expressed concerns regarding how normal volumetric fluctuations in the distribution system such as those

caused by product downgrading in pipelines could be adequately accounted for under a designate and track system so that such fluctuations would not mask the inappropriate shifting of 500 ppm sulfur NRLM diesel fuel to the highway pool. We have subsequently developed a periodic volume account balance system to account for such fluctuations.

Through discussions with terminal operators, we have also resolved concerns expressed in the NPRM that a designate and track approach might limit a terminal operator's ability to respond to shifts in demand for 500 ppm sulfur highway versus NRLM diesel fuel. To avoid this potential problem today's rule allows terminal operators and others to switch the designation of 500 ppm sulfur NRLM diesel fuel to highway diesel fuel on a temporary basis but not on a cumulative basis over time. This will allow terminal operators to sell NRLM designated 500 ppm sulfur fuel into the highway market provided that they later sell the same volume of highway-designated 500 ppm sulfur fuel into the NRLM market. To ensure that 500 ppm sulfur NRLM diesel fuel is not inappropriately shifted into the highway diesel pool, terminal operators will need to demonstrate that the volume of 500 ppm sulfur highway diesel fuel they delivered is less than or equal to the volume received.

In the NPRM, we stated that determining the responsible party for a violation of the restriction against shifting 500 ppm sulfur NRLM diesel fuel into the highway pool would be difficult under a designate and track approach because a number of parties in the distribution chain take custody of the fuel without taking ownership. However, this concern can be addressed by structuring the provisions to hold the custodian of the fuel accountable for any such violation that takes place while the fuel is in their custody. Review of electronic data submitted from all custodians in the highway and NRLM diesel fuel distribution chain will reveal the custodian responsible for a violation. By comparing such data on the hand-offs of designated fuel volumes between all adjacent pairs of custodians in the distribution chain for discrepancies, we can identify any party responsible for inappropriately shifting volumes of 500 ppm sulfur fuel designated for use in NRLM equipment to the highway market. Many terminals do not take ownership of the fuel that they handle. Terminals that lease storage tanks to multiple owners will need to enter into contractual agreements with their tenants to ensure that they understand their obligations as

a custodian of designated fuel and do not inappropriately change the designation of fuels stored in such leased tanks.

An effective enforcement and compliance assurance program must include the ability to rapidly and accurately review the large amount of data on the hand-offs of designated fuel volumes for discrepancies. This can be accomplished if all parties report electronically to a database which can reconcile hand-off volumes between all parties in the distribution chain in an automated fashion. All segments in the fuel distribution system are now in support of providing the necessary information to such an electronic reporting system. We have conducted a review of the Agency resources that would be needed to compile the industry reports on the transfer of designated fuel volumes, perform quality assurance on these data, and to perform the necessary analysis of the database to discover potential violations. Our review indicates that the reporting forms can be standardized and the review process automated in such a fashion as to minimize the Agency resource requirements, while at that same time ensuring the quality of the data and completeness of the review process. In light of the above discussion, we are now convinced that a designate and track approach can be designed to meet our enforcement and compliance assurance needs under today's rule.

In addition to concerns regarding the workability and enforceability of a designate and track approach, the NPRM expressed concerns that application of such an approach could reduce the benefits of the highway diesel program by reducing the amount of highway diesel fuel that is used in nonroad equipment due to the logistical constraints in the distribution system ("spillover"). Specifically, it was thought that the opportunity to fungibly ship batches of 500 ppm sulfur NRLM diesel fuel and 500 ppm sulfur highway diesel fuel might allow refiners to supply highway and NRLM diesel fuel to markets where they would otherwise have supplied just highway fuel for both purposes. Our reevaluation since the proposal indicates that this is not a significant concern. As noted earlier, there are currently substantial regions of the country where only highway diesel fuel is supplied by bulk shipments to both the highway and NRLM markets due to the high costs associated with segregating an additional distillate grade

in the distribution system.¹¹² These are the same areas where the majority of spillover occurs today. After the highway diesel program becomes effective in 2006, we project that only 15 ppm sulfur highway diesel fuel will be supplied in bulk shipments to both the highway and NRLM markets in most of these same areas. Although 500 ppm sulfur highway diesel fuel could be shipped in bulk to these areas through 2010 under the highway program's TCO, the potential demand for such fuel and for 500 ppm sulfur NRLM diesel fuel would not be sufficient to justify the cost of segregating an additional grade of 500 ppm sulfur diesel fuel in these areas for a short period of time. The designate and track approach does not impact the costs of segregation, and therefore is not expected to change distribution patterns that are based on these costs.

After 2010, when 500 ppm sulfur highway fuel no longer exists, the total volume of 500 ppm sulfur diesel fuel in the distribution system will be substantially reduced, and there will be even less incentive to distribute an additional grade of 500 ppm sulfur diesel fuel in bulk. Therefore, the only areas where substantial flexibility will exist under today's program to supply either highway or NRLM diesel fuel to the NRLM market is in areas where this flexibility exists today. Despite this flexibility in the current regulations, spillover currently still occurs. Therefore, we project that there will be little additional potential due to today's rule for refiners to reduce highway spillover into the NRLM market under a designate and track approach and that such spillover levels would not be significantly reduced from historical levels. In contrast, as discussed above, we now believe that the baseline approach would have resulted in a significant loss of 15 ppm diesel production.

Furthermore, concerns regarding a potential reduction in the spillover of 15 ppm sulfur highway diesel into the NRLM markets has been lessened by the information provided in the highway program pre-compliance reports. These reports suggest that more than 95 percent of highway diesel fuel will be produced to a 15 ppm sulfur standard beginning in 2006. In calculating the projected benefits of the highway diesel program, we assumed that only 80 percent of highway diesel fuel would meet a 15 ppm sulfur standard. Therefore, the actual benefits of the

highway program will be substantially greater than estimated if the projections in the pre-compliance reports are realized.

Based on the above discussion, we believe that the concerns regarding the designate and track approach's workability, enforceability, and ability to preserve the benefits of the highway program and today's NRLM diesel fuel program have been satisfactorily resolved.

b. Ensuring That Heating Oil Is Not Used in NRLM Equipment From June 1, 2007 Through June 1, 2010

i. Use of a Fuel Marker in Heating Oil

To prevent shifting heating oil into the NRLM market, we proposed that a fuel marker be added to heating oil at the refinery gate. We proposed that the presence of the marker required in heating oil would be strictly prohibited in NRLM diesel fuel. As noted earlier, this approach is similar to red dye requirements for high sulfur diesel fuel that were implemented in 1993 to prevent its use as highway diesel fuel subject to the then applicable 500 ppm sulfur standard.

We proposed that the marker be added at the refinery gate rather than at the terminal for several reasons. First, this seemed to be the most efficient and lowest cost option for addition of the marker given that the number of terminals is far greater than the number of refineries.¹¹³ Second, requiring that the marker be present in heating oil when it is introduced into the distribution system would ensure that we could differentiate high sulfur small refiner and credit fuel from heating oil at any point in the system. This approach would provide good assurance that the inability to use fuel sulfur content to differentiate heating oil from high sulfur NRLM diesel fuel produced under the small refiner and credit provisions in today's rule (effective until June 1, 2010) would not provide an opportunity to mask the potential use of heating oil in NRLM equipment. Providing such assurance is an essential element to enable the implementation of the small refiner and credit provisions in today's rule. Lastly, under the proposed baseline approach, there was no other way to ensure that heating oil was not shifted into the NRLM diesel fuel pool during distribution from the refinery/importer to the terminal.

We received numerous comments that the upstream addition of the proposed marker to heating oil would raise significant concerns that the marker

¹¹²This highway diesel fuel would meet the currently-applicable 500 ppm sulfur standard for highway diesel fuel.

¹¹³Additional injection equipment will be required to inject the heating oil marker.

might contaminate jet fuel. Commenters stated that this would represent a substantial safety concern unless the proposed marker was proven not to adversely impact the quality of jet fuel and the operation of jet engines.

The designate and track approach described above for 500 ppm sulfur NRLM diesel fuel, however, also provides an effective means to address concerns about the use of the fuel marker. By extending the designate and track approach to high sulfur NRLM diesel fuel and heating oil, these otherwise identical fuel grades can be tracked down to the terminal, and the marker then can be added at the terminal instead of at the refinery gate. Going beyond the terminal with designate and track is not feasible given the breadth and nature of entities involved.¹¹⁴ As a result, the marker is still required downstream of the terminal. However, shifting the point of marker addition downstream to the terminal should eliminate any significant opportunity for jet fuel contamination. Subsequent comments and discussions appear to have confirmed this.¹¹⁵ EPA will continue to work with other federal agencies, including FAA and DoD, and to follow ongoing research and studies regarding the effect of dyes and markers on jet fuel, particularly potential contamination that could have an adverse impact on the safe operation of aircraft. We will keep abreast of the ASTM, CRC, FAA, IRS, and EU activities regarding the evaluation of the use of SY-124 and commit to a review of our use of SY-124 under today's rule based on these findings. If alternative markers are identified that do not raise concerns regarding the potential contamination of jet fuel, we will initiate a rulemaking to evaluate the use of one of these markers in place of SY-124.¹¹⁶

We also received a number of comments expressing concern over the inability of the proposed marker to be detected using the standard simple test used today to detect contamination with red dye.¹¹⁷ The marker finalized by

today's rule does not provide visual evidence of its presence. However, if the marker is added at the terminal it will only be present in heating oil when red dye is also present. The fact that heating oil will be dyed red pursuant to IRS requirements before it leaves the terminal will enable jet fuel distributors to continue to use the "white bucket test" to detect heating oil contamination, and hence marker contamination of jet fuel. Today's rule also includes a stand-alone requirement that any fuel to which the fuel marker is added must also contain visible evidence of red dye.¹¹⁸

ii. Provisions To Ensure Heating Oil Is Not Used in NRLM Equipment in the Northeast and Mid-Atlantic

In the Northeast, heating oil will continue to be distributed in significant quantities after implementation of the NRLM diesel fuel program. Discussions with terminal operators in the Northeast, and other representatives of heating oil users and distributors, revealed concerns that the proposed heating oil marker requirement would represent a substantial new burden on terminal operators and users of heating oil. Terminal operators stated that the cost of installing new injection equipment would be burdensome, and that the cost of the marker itself would be significant given the large volume of heating oil used in the Northeast. They also stated that they did not expect any small refiner or credit fuel to be used in the Northeast, and that consequently, the marker requirement was not needed in this area. They suggested that if we prohibited the sale of small refiner and credit fuel in PADD I, this area could be exempted from the heating oil marker requirement.

We evaluated the viability of avoiding the heating oil marker requirement in portions of PADD I and instead enforcing the NRLM diesel fuel standards on the basis of sulfur content alone. The heating oil marker is needed to ensure that heating oil is not sold into the NRLM market as high sulfur NRLM fuel. The marker is needed only if high sulfur NRLM fuels will otherwise be in the market. High sulfur NRLM fuel can be produced under the small refiner and credit provisions, and through the generation of high sulfur NRLM in the distribution system from the downgrading of 500 ppm sulfur NRLM. In evaluating the feasibility of avoiding the heating oil marker, EPA therefore

focused on determining the likely production and marketing of these high sulfur NRLM fuels in portions of PADD I in this time frame.

We held in-depth discussions with organizations representing refiners, pipelines, and terminal operators to evaluate this issue. Representatives of non-small refiners including API and NPRA stated that being precluded from selling sulfur credit fuel in the Northeast and Mid-Atlantic would not significantly reduce the intended benefits to refiners of the credit provisions in today's rule. We also spoke with small refiner representatives of and the specific small refiners whose marketing area might include the Northeast and Mid-Atlantic and found that in fact, small refiners were not expected to market fuel in this area. Finally, we evaluated the current and likely future practices in the Northeast and Mid-Atlantic areas for the sale of downgraded fuel generated in the distribution system. We found that this downgraded diesel fuel could easily continue to be sold in the very large and ubiquitous heating oil market that is expected to continue to exist in this region. This avoids any need for additional storage or tankage for both high sulfur and low sulfur NRLM fuels, and fits into the pre-existing market structure for heating oil.

Consequently, unlike the rest of the country, there was little expected need to maintain a high sulfur NRLM market in this part of the country as an outlet for small refiner, credit, or off-specification, downgraded diesel fuel. Based on this input, we concluded that codifying this expected practice and making it enforceable, *i.e.* not allowing high sulfur fuel to be marketed as NRLM in this area of the country, would be consistent with the current distribution practices in this area of the country and that the potential impact of taking such an approach on the flexibility offered in the program would be minimal or nonexistent. If we codified it we would no longer need the marker requirement, and the resulting benefits and cost savings to terminals would be substantial. The approach would also simplify and strengthen the enforcement of today's sulfur requirements in this area by allowing EPA to enforce the NRLM standards simply based on the measurement of the sulfur content of the fuel. There would be little expected impact on the environment as this is not expected to change the amount of high sulfur fuel produced from small refiners, credit usage, or downgrade in the distribution system, only the market into which it is sold.

¹¹⁴ Including every end-user of heating oil.

¹¹⁵ Letter to Paul Machiele, EPA, from James Thomas, American Society for Testing and Materials (ASTM), entitled "Withdrawal of ASTM Request," January 19, 2004. In this letter ASTM withdraws its request for a postponement of the finalization of the heating oil marker requirements in today's rule. See section V.E regarding the selection of the heating oil marker required in today's rule.

¹¹⁶ See section VIII.H. of today's preamble.

¹¹⁷ To test for contamination, jet fuel marketers typically fill a white five gallon bucket with jet fuel. The presence of a pink tinge to the light straw colored jet fuel indicates that the fuel has been contaminated with fuel that contains red dye.

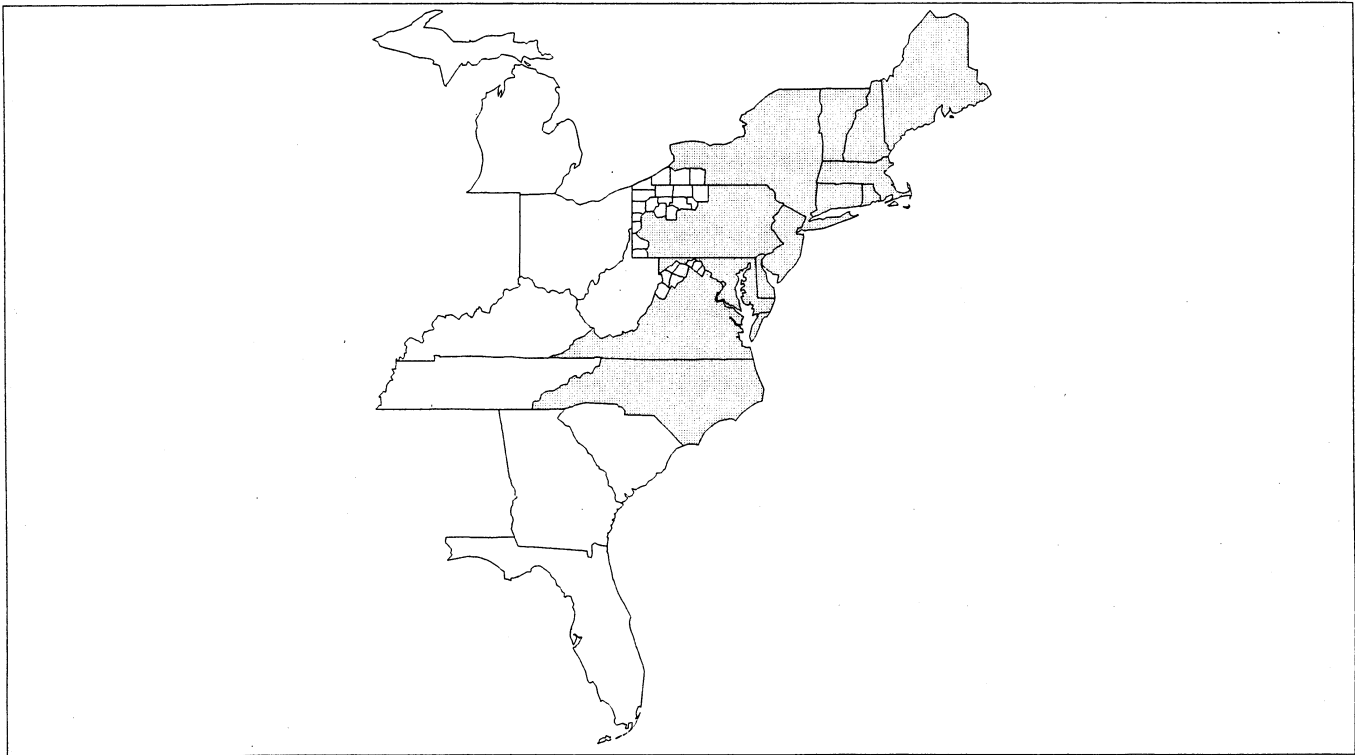
¹¹⁸ If IRS amends its red dye requirements, EPA will also seriously consider amending the fuel marker and associated red dye requirements contained in today's rule. See section V.E. of today's preamble.

In deciding which parts of PADD I to use this enforcement mechanism, we attempted to minimize the number of terminals that would need to install new injection equipment and the amount of heating oil that would need to be marked, while preserving the benefits of the small refiner and credit fuel provisions in today's rule to the maximum extent possible. To assess the placement of the boundary for the Northeast/Mid-Atlantic area where the marker requirement was waived, we evaluated the magnitude of heating oil demand by state (see chapter 5 of the RIA), solicited input from the potentially affected parties, evaluated the area supplied by the pipeline distribution systems that are expected to continue to ship heating oil after the implementation of today's rule, evaluated the locations of terminals that are likely to receive bulk shipments of heating oil, evaluated the distribution area of small refiner(s) for high sulfur

NRLM diesel fuel, and reviewed heating oil use levels in areas that will have access to bulk shipments of heating oil. Based on our assessment we concluded that defining the Northeast/Mid-Atlantic area as described below would best achieve our goals.¹¹⁹ In most cases, whole states in PADD 1 were assigned to this "Northeast/Mid-Atlantic" area. This decision was primarily based on the continued high level of heating oil use projected in these states and the lack of significant concern regarding the elimination of the program's flexibilities to produce high sulfur NRLM diesel fuel in these states. A few counties in Eastern West Virginia were also assigned to the Northeast/Mid-Atlantic area based on supply patterns in the area. On the other hand, a number of counties in Western New York and Pennsylvania were not assigned to the Northeast/Mid-Atlantic area due to the need to maintain flexibilities for refiners serving this area.

In summary, the areas excluded from the marker requirement and where the sale of NRLM diesel fuel produced or imported under the credit and hardship provisions or from the downstream downgrade provisions of today's rule is prohibited are: North Carolina, Virginia, Maryland, Delaware, New Jersey, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine, Washington DC, New York (except for the counties of Chautauqua, Cattaraugus, and Allegany), Pennsylvania (except for the counties of Erie, Warren, Mc Kean, Potter, Cameron, Elk, Jefferson, Clarion, Forest, Venango, Mercer, Crawford, Lawrence, Beaver, Washington, and Greene), and the eight eastern-most counties in West Virginia (namely: Jefferson, Berkeley, Morgan, Hampshire, Mineral, Hardy, Grant, and Pendleton). The Northeast/Mid-Atlantic Area is illustrated in the following figure:

Figure IV.D-1. – Northeast/Mid-Atlantic Area Where Marker is not Required



As discussed in section IV.D.2 below, the marker requirement for 500 ppm sulfur LM diesel fuel that will be effective outside of this Northeast/Mid-Atlantic area and Alaska from June 1, 2010, through May 31, 2012, was not a

significant factor in our evaluation of how to define the boundary of the Northeast/Mid-Atlantic area. We expect that locomotive and marine diesel fuel subject to the marker requirements will primarily be distributed via segregated

pathways from a limited number of refineries. Therefore, a significant number of terminals will not need to handle LM diesel fuel that is subject to the marker requirement. Thus, the potential cost of installing injection

¹¹⁹ See chapter V of the RIA for a detailed discussion of the analysis which supports our definition of the Northeast/Mid-Atlantic areas

where the marker requirement is waived. See section VI of today's preamble and chapter VII of

the RIA for a discussion of the costs of the heating oil marker requirements finalized by today's rule.

equipment to add the marker to 500 ppm sulfur LM diesel fuel which is subject to the marker requirement will be limited to only a few refineries and terminals (*i.e.* approximately 15, *see* section VI.A of today's preamble).

In all areas of the country other than the Northeast/Mid-Atlantic area shown in figure IV.D-1 (and Alaska as discussed below), heating oil, and high sulfur NRLM diesel fuel will be designated at the refinery or importer and tracked through the distribution system to the terminal. From June 1, 2010, through May 31, 2012, 500 ppm sulfur LM diesel fuel and 500 ppm nonroad diesel fuel must also be designated at the refinery or importer and tracked through the distribution system to the terminal outside of the Northeast/Mid-Atlantic area and Alaska. The specified fuel marker (*see* section V.E of this preamble) must be added to heating oil distributed from all terminals located outside of the Northeast/Mid-Atlantic area defined above and Alaska. The same fuel marker must also be added to 500 ppm sulfur LM diesel fuel produced at a refinery or imported that is distributed from terminals located outside of the Northeast/Mid-Atlantic area and Alaska from June 1, 2010, through May 31, 2012. This includes all heating oil and the subject 500 ppm sulfur LM diesel fuel distributed from terminals outside of the Northeast/Mid-Atlantic area regardless of whether the fuel is delivered to a retailer, wholesale purchaser-consumer, or end-user located inside or outside of the Northeast/Mid-Atlantic area.

Terminals inside the Northeast/Mid-Atlantic area are exempted from the fuel marker requirements in today's rule, but only for the volume of heating oil and 500 ppm sulfur LM diesel fuel subject to the marker requirements that is used by wholesale-purchaser-consumers and end-users that are located inside the Northeast/Mid-Atlantic area. Any heating oil and subject 500 ppm sulfur LM diesel fuel distributed from terminals inside the Northeast/Mid-Atlantic area to a retailer, wholesale-purchaser-consumer, or end-user that is located outside of the Northeast/Mid-Atlantic area must be marked.

Terminal operators do not often distribute fuel to retailers, wholesale-purchaser-consumers, and end-users directly. This task is frequently accomplished by "jobbers" who pick up large tank truck loads of fuel from the terminal for delivery to their retailer and wholesale-purchaser-consumer customers, "heating oil dealers" who pick up fuel from a terminal using a smaller capacity tank truck (often

referred to as a tank wagon) for direct delivery to heating oil users, and by bulk plant operators. Bulk plant operators pick up fuel from terminals as described above. However, since they maintain their own bulk fuel storage facilities, they have the choice of storing the fuel at their facility prior to eventual delivery to their customers. Under the provisions of today's rule, as long as a bulk plant only receives heating oil to which the marker has already been added, it does not have to register, keep records, or report. However, if it chooses to receive any unmarked heating oil, then it will be treated the same as a large terminal under the provisions of today's final rule. We do not expect that bulk plants will handle LM diesel fuel to a significant degree. For bulk plant operators that might handle LM diesel fuel, today's rule provides that as long as a bulk plant does not receive any 500 ppm sulfur LM diesel fuel which is required to be marked under today's rule, but which has not yet been marked, it does not have to register, keep records, or report. However, if it chooses to receive any unmarked 500 ppm sulfur LM diesel fuel which is subject to the marker requirements under today's rule, then it will be treated the same as a large terminal under the provisions of today's final rule.

Any party that transports bulk quantities of heating oil solely to the Northeast/Mid-Atlantic area or within this area is not subject to the designate and track requirements for heating oil described below. Similarly, any party that transports bulk quantities of 500 ppm sulfur LM diesel fuel solely to the Northeast/Mid-Atlantic area or within this area is not subject to the designate and track requirements for LM diesel fuel. However, any high sulfur fuel distributed from inside the Northeast/Mid-Atlantic area to outside of the Northeast/Mid-Atlantic area must be designated as heating oil by the party responsible for the transfer and must be marked. Likewise, any 500 ppm sulfur LM diesel fuel distributed from inside the Northeast/Mid-Atlantic area from June 1, 2010, through May 31, 2012, must be designated as 500 ppm sulfur LM diesel fuel by the party responsible for the transfer and must be marked.

Entities who are required to inject marker into heating oil must maintain records of the volume of marker used in heating oil, and the volume of heating oil distributed over the compliance period. Entities that are required to inject marker into 500 ppm sulfur LM diesel fuel must maintain records of the volume of marker used in 500 ppm sulfur LM diesel fuel, and the volume of

500 ppm sulfur LM diesel that is required to be marked which is distributed over the compliance period. These records must demonstrate that the prescribed marker concentration was present in the heating oil and the 500 ppm sulfur LM diesel fuel subject to the marker requirement that they discharged.

iii. State of Alaska

Although the fuel marker facilitates the enforcement of the NRLM diesel fuel sulfur standards by distinguishing it from heating oil, as described above, we are not requiring use in Alaska. Unlike the situation in the Northeast and Mid-Atlantic area, however, we are not prohibiting the production of high sulfur NRLM diesel fuel after 2007, and 500 ppm nonroad diesel fuel from after 2010 by small refineries in Alaska. While such a prohibition in the Northeast/Mid-Atlantic area does not impact small refineries, flexibility for small refineries is expected to be important in Alaska. Thus, we need to preserve the flexibility for high sulfur NRLM diesel fuel in Alaska for small refineries along with eliminating the marker. The program must therefore provide another means of enforcing the NRLM diesel fuel sulfur standards without eliminating a small refiner's ability to produce and distribute high sulfur NRLM diesel fuel.

Under today's program we are finalizing a provision that will allow flexibility for small refineries to delay compliance with the NRLM diesel fuel sulfur standards as discussed in section IV.B. Small refineries in Alaska may avail themselves of this option provided that the refiner first obtains approval from the administrator for a compliance plan. The plan must at a minimum show the following information:

- (1) How they will segregate its fuel through to end-users;
- (2) How they will segregate its fuels from other grades and other refineries' fuels; and
- (3) All end-users to whom the fuel is sold as well as the fuel volumes.

End-users who receive the fuel must retain records of all fuel shipments to demonstrate that no heating oil was used in NRLM diesel equipment and that no 500 ppm sulfur LM diesel was used in nonroad equipment. In order to limit the potential sources of fuel not meeting the sulfur standard, constrain the number of end-users who may legitimately have higher sulfur fuel in their NRLM diesel equipment, and thus maintain the overall program's enforceability, we are not finalizing the other provisions that allow for higher sulfur fuel to be produced and/or distributed in Alaska (*i.e.*, credit, transmix processor, or downstream

distribution system provisions). In this regard, Alaska is treated in the same manner as the Northeast/Mid-Atlantic area.

c. Updating the Highway Program's Anti-Downgrade Requirements

Under the highway diesel fuel program, each entity in the distribution system may downgrade a maximum of 20 percent of the 15 ppm sulfur highway diesel fuel it receives to 500 ppm sulfur highway diesel fuel. However, there was no limit on the volume of 15 ppm sulfur highway diesel fuel that could be downgraded to NRLM diesel fuel. Prior to today's rule, this was appropriate because the sulfur content of NRLM diesel fuel was uncontrolled, and hence once 15 ppm sulfur highway diesel fuel was downgraded to NRLM diesel fuel such fuel could not be used in the 500 ppm sulfur highway diesel market. The implementation of today's 500 ppm sulfur standard for NRLM diesel fuel, however, means that 15 ppm sulfur highway fuel downgraded to 500 ppm sulfur NRLM diesel fuel potentially could be shifted into the highway market. This could undermine the benefits of the highway program for the reasons described previously. To prevent this situation, we proposed that the anti-downgrading requirements under the highway diesel program would also apply to the downgrading of 15 ppm sulfur highway diesel fuel to 500 ppm sulfur NRLM diesel fuel. We received comments from refiners and fuel distributors that such a limitation would restrict their ability to supply the NRLM diesel market, particularly in areas where refiners plan to supply only 15 ppm sulfur diesel fuel for both the highway and NRLM markets.

Putting in place the designate and track provisions allows 500 ppm sulfur highway and 500 ppm sulfur NRLM diesel fuel to be tracked separately. This enables the anti-downgrading requirements to only apply to the downgrading of 15 ppm sulfur highway diesel fuel to 500 ppm sulfur highway fuel as originally required in the 2007 highway final rule. In the context of the designate and track requirements in today's rule, the highway program's anti-downgrading provisions are clarified as described below. Similar to the approach described above regarding the prevention of the use of 500 ppm sulfur NRLM diesel fuel in the highway market, each custodian of 15 ppm sulfur No. 2 highway diesel fuel must maintain records that demonstrate their compliance with the highway program's anti-downgrade requirements. The anti-downgrading requirements do not apply

to 15 ppm sulfur No. 1, diesel fuel. Such fuel will be manufactured for wintertime blending to improve diesel cold flow properties. In a number of areas we expect that 15 ppm sulfur No. 1 fuel will be the only No.1 fuel available for winterizing highway and NRLM diesel fuel, and heating oil. Therefore, applying the anti-downgrading requirements to 15 ppm sulfur No. 1 fuel would be unnecessary to maintain the availability of 15 ppm sulfur highway diesel fuel, and would interfere with its intended use in the range of No. 2 fuels.

From October 1, 2006, through May 31, 2010, all fuel distributors downstream of the refiner or import facility must satisfy one of four criteria as outlined in 40 CFR 80.598 of today's regulation to demonstrate compliance with the highway program's anti-downgrading requirements. These criteria are based on the designate and track system for different grades of fuel through the distribution system. The first criteria is the simplest and most straightforward, with the least record keeping burden. It merely tracks a facility's No. 2 15 ppm sulfur highway diesel volume receipts and deliveries and requires the deliveries to be at least 80 percent of the receipts. Since the anti-downgrading provisions were implemented to protect against intentional downgrading and not to limit downgrading that would occur in the normal distribution of 15 ppm sulfur fuel, we anticipate that most facilities will be able to easily meet this simple criteria.

The second criteria tracks a facility's receipts and distribution of both No. 2 15 ppm sulfur fuel and No.2 500 ppm sulfur highway diesel fuel, and limits deliveries of No. 2 500 ppm sulfur highway diesel fuel to no more than what was received plus 20 percent of the No. 2 15 ppm sulfur highway diesel fuel volume received. This allows more flexibility than the first criteria by not constraining downgrades to NRLM diesel fuel or heating oil, but does so by requiring tracking and records of volumes of No. 2 15 ppm sulfur highway diesel fuel received and the products to which it is downgraded.

The third and fourth criteria provide even more flexibility, especially for wintertime blending of No. 1 15 ppm sulfur highway diesel fuel, and also for any temporary shifts that might occur between NRLM diesel fuel and highway diesel fuel markets from 2007–2010. However, a facility will have to meet more extensive criteria to demonstrate compliance.

Today's final rule does not change any other aspects of the anti-

downgrading provisions finalized in the 2007 highway diesel final rule, such as the provisions unique to fuel retailers.

2. Requirements During the Second Step of Today's Sulfur Control Program

Beginning June 1, 2010, all NR diesel fuel and beginning June 1, 2012 all LM diesel fuel produced or imported must meet a 15 ppm sulfur standard except for fuel manufactured under the credit and small refiner provisions in today's rule. This credit and small refiner diesel fuel must meet a 500 ppm sulfur level. From June 1, 2010 to June 1, 2012, all LM diesel fuel must meet a 500 ppm sulfur standard. Today's rule also allows 500 ppm sulfur diesel fuel generated in the pipeline distribution system to be used in NRLM equipment through May 31, 2014¹²⁰ and in locomotive and marine equipment thereafter. After May 31, 2014, the credit and small refiner provisions expire.

We proposed that once refiners were no longer able to produce 500 ppm sulfur diesel fuel for use in nonroad engines and such fuel had a few months to work its way through the distribution system, that 500 ppm sulfur diesel fuel could no longer be used in nonroad equipment. Today's rule adopts this proposed prohibition. Although today's rule extends the 15 ppm sulfur nonroad diesel standard to locomotive and marine diesel fuel, we have elected not to extend the prohibition against the use of 500 ppm sulfur diesel fuel in locomotive and marine equipment after refiners and importers are no longer allowed to produce/import such fuel. Diesel fuel with a maximum sulfur concentration of 500 ppm that is generated in the pipeline distribution system can continue to be used in locomotive and marine equipment after June 1, 2014, as discussed in section IV.A above.

Providing for the continued use of 500 ppm sulfur diesel fuel in NRLM equipment through May 31, 2014, means that without adequate controls similar to those under the first step of today's program, a refiner could manufacture 500 ppm sulfur diesel fuel ostensibly for use as heating oil which could actually be sold downstream into the NRLM market through May 31, 2014. Similarly, the continued use of 500 ppm fuel in locomotive and marine engines after May 31, 2014, means that without adequate controls, a refiner could continue to manufacture 500 ppm sulfur diesel fuel ostensibly for use as heating oil which could actually be sold

¹²⁰ The use of 500 ppm fuel in nonroad equipment is restricted to 2011 model year and earlier equipment.

downstream into the locomotive and marine market indefinitely. To prevent this possibility, we have elected to continue the designate and track and marker requirements for heating oil applicable under the first step of today's program indefinitely with some simplifications. It is a significantly smaller program during the second step, since only heating oil needs to be tracked, and we expect that by then very little heating oil will be produced for sale outside of the Northeast/Mid-Atlantic area. Consistent with the approach taken during the first step of today's program, these designate and track provisions would not be applicable in the Northeast/Mid-Atlantic area or Alaska, since the flexibility to sell greater than 15 ppm sulfur diesel fuel into the NRLM market there does not exist under this final rule.¹²¹ Any diesel fuel with a sulfur content greater than 500 ppm beginning June 1, 2007, any NR diesel fuel with greater than 15 ppm sulfur beginning June 1, 2010, and any LM diesel fuel with greater than 15 ppm sulfur beginning June 1, 2012 in the Northeast/Mid-Atlantic area can only be sold as heating oil, and if shipped outside of the Northeast/Mid-Atlantic area must be marked as heating oil.

While today's rule does not contain an end date for the downstream distribution of 500 ppm sulfur locomotive and marine fuel, we will review the appropriateness of allowing this flexibility based on experience gained from implementation of the 15 ppm sulfur NRLM diesel fuel standard. We expect to conduct such an evaluation in 2011. Were we to discontinue the downstream provision for downgraded fuel, we would also evaluate discontinuing the designate and track and marker requirements for heating oil, as is the case now for the Northeast/Mid-Atlantic area.

Providing for the continued production and import of 500 ppm sulfur LM diesel fuel from June 1, 2010 to June 1, 2012 means that without adequate controls similar to those under the first step of today's program, a refiner could manufacture 500 ppm sulfur diesel fuel ostensibly for use as LM diesel fuel which could actually be sold downstream into the NR market. To prevent this possibility, we have adopted designate and track and marker requirements similar to those applicable to heating oil under the first step of today's program. For these two years, 500 ppm sulfur NR and LM diesel fuel

would be tracked, and the 500 ppm sulfur LM fuel would be marked in the same manner as heating oil. The same provisions that apply to marking of heating oil, such as the Northeast/Mid-Atlantic area, would also apply to the marking of 500 ppm sulfur LM fuel. The tracking and marking provisions would not apply to any 15 ppm sulfur LM diesel fuel.

3. Summary of the Designate and Track Requirements

The designate and track program requires refiners and importers to designate the volumes of diesel fuel they produce and/or import. Refiners/importers will identify whether their diesel fuel is highway or NRLM and the applicable sulfur level. They may then mix and fungibly ship highway and NRLM diesel fuels that meet the same sulfur specification without dyeing their NRLM diesel fuel at the refinery gate. The volume designations will follow the fuel through the distribution system with limits placed on the ability of downstream parties to change the designation. These limits are designed to restrict the inappropriate sale of 500 ppm sulfur NRLM diesel fuel into the highway market; from 2007 to 2010, the inappropriate sale of 500 ppm sulfur LM diesel fuel into the 500 ppm sulfur NR market from 2010 to 2012; and the inappropriate sale of heating oil into the NRLM market. The designate and track approach includes record keeping and reporting requirements for all parties in the fuel distribution system, associated with tracking designated fuel volumes through each custodian in the distribution chain until the fuel exits the terminal. The program also includes enforcement and compliance assurance provisions to enable the Agency to rapidly and accurately review for discrepancies the large volume of data collected on fuel volume hand-offs.

a. Registration

Each entity in the fuel distribution system, up through and including the point where fuel is loaded onto trucks for distribution to retailers or wholesale purchaser-consumers, must register each of its facilities with EPA no later than December 31, 2005, or six months prior to commencement of producing, importing, generating, or distributing any designated diesel fuel.¹²² A facility is defined as the physical location(s) where a party has custody of designated fuel, from when it was produced, imported, or received from one party to

when it is delivered to another party. The definition also include mobile components, such as the vessels in a barge facility. Examples of facilities include refineries, import terminals, pipelines, terminals, bulk plants, and barge systems. Where the same entity owns and operates a series of locations in the distribution system (e.g., refiner to pipeline to terminal), it may choose to register them as a single aggregated facility, provided the entity maintains custody of the fuel throughout the facility. However, if the aggregated facility includes a refinery, then it may not receive any diesel fuel from another entity at any place within the aggregated facility. Under this approach, a pipeline could be treated as one facility from the point where it receives fuel to the point where it either delivers it to a terminal, or into a tank truck after passing through their terminal. The choice made by the entity to treat these places as a single facility or separate facilities may not change during any applicable compliance period. These same definitions for facility will apply for both the designate and track provisions, as well as the anti-downgrading provisions of the highway rule. Therefore, if a proprietary system chooses to aggregate into one facility for purposes of the designate and track provisions, it will also be treated as one facility for determining compliance with the 20 percent anti-downgrading limit of the highway rule. EPA will provide a unique registration number to each custodial facility of designated fuels. In addition, EPA intends to work with industry subsequent to this final rule to provide guidance regarding facility boundary and aggregation decisions that will address the many unique situations.

The designation provisions described below require refiners and importers to designate all distillates they produce or import consistent with the production and end-use requirements in today's rule. These designations serve as the foundation upon which the fuel distributors are able to properly track, designate, redesignate, and label the fuel they receive.

b. Designation by Refiners and Importers

i. Designation of 500 ppm and 15 ppm Sulfur Diesel Fuel

From June 1, 2006, through May 31, 2010, any refiner¹²³ or importer that

¹²¹ Unless, in the case of Alaska, the refiner segregates its fuel through to the end user as discussed in section IV.D.1.b.ii.

¹²² This requirement also applies to parties inside of the Northeast/Mid-Atlantic area who handle heating oil.

¹²³ Transmix operators that produce diesel fuel from transmix and terminal operators that produce from segregated interface will be treated as a refiner

produces or imports 15 ppm sulfur diesel fuel, and/or 500 ppm sulfur diesel fuel must designate all batches of such fuel as one of the following. The purpose of this designation requirement is to ensure that 500 ppm sulfur NRLM diesel fuel is not shifted into the highway market, and to evaluate compliance with the highway program's anti-downgrade requirements.

- 15 ppm sulfur No. 2 highway diesel fuel;
- 15 ppm sulfur No. 1 highway diesel fuel;
- 500 ppm sulfur No. 2 highway diesel fuel;
- 500 ppm sulfur No. 1 highway diesel fuel;
- 500 ppm sulfur No. 2 NRLM diesel fuel;
- 500 ppm sulfur No. 1 NRLM diesel fuel;
- 500 ppm sulfur jet fuel; or
- 500 ppm sulfur kerosene.

The start date for these requirements coincides with the start date for the early credit program under today's final rule, and the start date for the highway diesel program for the purposes of anti-downgrading. The end date for these requirements coincides with the end date for the highway program's Temporary Compliance Option and today's NRLM diesel fuel early credit program.

Any batch of 15 ppm or 500 ppm No. 1 diesel fuel which is also suitable for use as kerosene or jet fuel (referred to as dual-purpose kerosene) may be considered kerosene or jet fuel and need not be designated as highway or NRLM diesel fuel, even if it may later be blended into highway or NRLM diesel fuel downstream of the refinery to improve the cold-flow properties of the fuel. Upon such blending, the kerosene or jet fuel takes on the designation of the diesel fuel into which it was blended. We expect refiners and importers will elect to designate all of their 15 ppm sulfur No. 1 diesel fuel as highway fuel, since this will aid in their compliance with the highway program's 80/20 highway fuel production requirement. Designation as highway diesel fuel by the refiner will also help avoid downstream blending from causing a violation by the downstream party under the tracking and compliance calculations finalized today. We also expect that refiners and importers will elect to designate their 500 ppm sulfur No. 1 fuel as kerosene or jet fuel since this will be the predominant use for such fuel, and designating it as highway would hinder their compliance with the

80/20 highway requirements. As with 15 ppm sulfur kerosene or jet fuel, downstream parties would later redesignate it as highway or NRLM diesel fuel if blended in or used for these purposes. Any 500 ppm sulfur diesel fuel containing visible evidence of red dye must be designated as NRLM diesel fuel or heating oil unless it is tax exempt highway diesel fuel (*e.g.*, fuel for use in school buses or certain municipal fleets).

The reported volumes of designated fuels must be the volumes delivered to the first downstream party. This is typically a pipeline facility, a marine barge/tanker loading dock that accepts product from a refiner/importer, or the refiner's/importer's truck loading rack. This is consistent with normal business practices. Refiners, importers, and transmix processors are not required to add red dye to NRLM diesel fuel unless the fuel is distributed over their truck loading rack such that the IRS requires the addition of red dye for the assessment of taxes.

Fuel designated by a refiner or importer as highway diesel fuel must comply with the highway program's 80/20 requirement for 15 ppm/500 ppm sulfur highway diesel fuel. The volume of fuel designated as NRLM early credit fuel must be consistent with the credit provisions in today's rule. Since highway diesel fuel volumes are determined at the point of delivery from the refiner/importer to another party, the anti-downgrade requirements do not apply to refiners and importers. Under the highway diesel fuel program, refiners that are required to produce 100 percent of their highway diesel fuel to a 15 ppm sulfur standard are provided with an allowance to deliver a small percentage of 500 ppm sulfur diesel fuel to the pipeline (*e.g.*, small refiners and GPA refiners who exercise an option under the 2007 highway rule to delay compliance with gasoline sulfur standards). This allowance is provided because a small volume of "line-wash" is typically generated in the feed line from the refiner's facility to the pipeline. This line-wash will often be suitable for use as 500 ppm sulfur highway diesel fuel. Under the provisions of the highway rule this line-wash could have been excluded from compliance with the 15 ppm standard if the refiner accounted for their production volume prior to shipment. However, in this rule, all volume-related requirements are keyed to the volume actually delivered. As a result of this change in the point of fuel volume measurement (delivered versus produced), we are amending the highway diesel fuel program

requirements such that refiner who was previously required to produce 100 percent of its highway diesel fuel to the 15 ppm sulfur standard may now produce 95 percent to the 15 ppm sulfur standard (in order to avail itself of the extended gasoline sulfur interim standards).

ii. Designation of High Sulfur NRLM Diesel Fuel, Heating Oil, and Jet Fuel/Kerosene

From June 1, 2007 through May 31, 2010, any refiner, or importer not located in the Northeast/Mid-Atlantic area or Alaska, that produces or imports unmarked high sulfur distillate fuel must designate all batches of such fuel as one of the following: heating oil, high sulfur NRLM diesel fuel, or jet fuel/kerosene. Any heating oil distributed from a refiner's or importer's rack not located in the Northeast/Mid-Atlantic area or Alaska must contain the designated marker and red dye. Any heating oil distributed from a refiner/importer rack inside of the Northeast/Mid-Atlantic area or Alaska is exempted from the marker requirement except any heating oil that is delivered outside the Northeast/Mid-Atlantic area must be marked.

As discussed previously, 500 ppm sulfur diesel fuel may be used in NRLM equipment through May 31, 2014 and in locomotive and marine equipment thereafter. Therefore, designate and track provisions for heating oil will be needed to ensure that heating oil is not shifted into the NRLM market from June 1, 2007 through May 31, 2014, and to the locomotive and marine market thereafter. Consequently, from June 1, 2010 through May 31, 2014, refiners and importers must continue to designate any heating oil they produce as such as well as any 500 ppm sulfur NRLM diesel fuel produced under the small refiner, transmix/segregated interface, and credit provisions.

Beginning June 1, 2014, refiners and importers may no longer produce or import 500 ppm sulfur diesel fuel for use in NRLM equipment. Therefore, beginning June 1, 2014, all diesel fuel with a sulfur level greater than 15 ppm must be designated as heating oil, jet fuel, or kerosene. The one exception to this is transmix processors and terminals acting as refiners which will be permitted to produce 500 ppm sulfur diesel fuel for use in locomotive and marine equipment from transmix and segregated interface.

iii. Designation of 500 ppm NR and 500 ppm LM Sulfur Diesel Fuel

From June 1, 2010, through May 31, 2012, any refiner or importer that

produces or imports 500 ppm sulfur NR diesel fuel (small refiner and credit) and/or 500 ppm sulfur LM diesel fuel must designate all batches of such fuel. The purpose of this designation requirement is to ensure that 500 ppm sulfur LM diesel fuel is not shifted into the NR market. Any 500 ppm sulfur LM diesel fuel distributed from a refiner's or importer's rack not located in the Northeast/Mid-Atlantic area or Alaska must contain the designated marker and red dye, along with heating oil. Any 500 ppm sulfur LM diesel fuel distributed from a refiner/importer rack inside of the Northeast/Mid-Atlantic area or Alaska is exempted from the marker requirement except any 500 ppm sulfur LM fuel that is delivered outside the Northeast/Mid-Atlantic area must be marked.

c. Designation and Tracking Requirements Downstream of the Refinery or Importer

The result of the refiner/importer designation provisions is that all of the diesel fuel received by distributors will be clearly and accurately designated. The distributors are then subject to their own designation and tracking requirements. The downstream provisions are designed to ensure that certain fuel shifts do not occur, such as the inappropriate shifting of 500 ppm sulfur NRLM diesel fuel to the highway market, the inappropriate shifting of 500 ppm sulfur LM diesel fuel into the nonroad market, the inappropriate downgrading of 15 ppm sulfur to 500 ppm sulfur highway diesel fuel, and the inappropriate shifting of heating oil to the NRLM market. The downstream provisions are designed to ensure these results in a readily enforceable manner while maximizing downstream flexibility to address changing market conditions.

In general, each time custody of designated fuel is transferred from one facility to another facility, the transferor must designate the fuel and record its volume. The party who receives custody must record the same information, to ensure that each party relies on the same designation and volume for its own compliance purposes. This process occurs each time custody of diesel fuel is transferred. Each distributor may redesignate fuel while in its custody or when it is delivered, subject to certain basic requirements. First, any redesignation must be accurate. For example, 500 ppm sulfur NRLM diesel fuel can not be redesignated as 15 ppm unless it in fact meets the 15 ppm standard. The sulfur standard applicable to downstream fuel is based on the fuel's designation. Second, there are

limits on the fuel volumes that can be redesignated, calculated as a volume balance over a specified compliance period. Specifically, the volumes of 15 ppm and 500 ppm sulfur highway received must be compared to the volumes of these fuels delivered, to ensure that the amount of 15 ppm sulfur highway diesel fuel that is downgraded to 500 ppm sulfur highway diesel fuel complies with the highway program's anti-downgrading requirements. The volumes of 500 ppm sulfur highway and NRLM diesel fuel that a distributor receives must also be compared to the volumes of 500 ppm sulfur highway and NRLM diesel fuel delivered, to ensure that NRLM diesel fuel was not inappropriately transferred to the highway market. The volumes of 500 ppm sulfur NR and LM diesel fuel received must be compared to the volumes of 500 ppm sulfur NR and LM diesel fuel delivered, to ensure that the 500 ppm sulfur LM fuel was not inappropriately transferred to the NR market. In addition, the volumes of heating oil received must be compared to the volumes distributed to ensure it was not inappropriately transferred to the NRLM market. These volume balances are calculated over a compliance period, providing distributor's the day to day flexibility to redesignate fuel based on market conditions, as long as the required volume balance is achieved over the compliance period. Finally, once NRLM diesel fuel is dyed, 500 ppm sulfur LM diesel fuel is marked (2010–2012), or heating oil is marked, the dye and marker may be used to ensure the fuels are not inappropriately shifted to other markets, and the designation, tracking and volume balance requirements are no longer needed; just the PTD, labeling, and record keeping provisions typical of our other fuel regulations (*e.g.*, highway diesel) apply.

In large part, the designate and track provisions are structured to be compatible with the normal business practices currently used by the industry to record and reconcile volume transactions between parties. As such, EPA expects that these downstream provisions can be implemented in a fairly straightforward manner.

i. Designation and Tracking of 500 ppm and 15 ppm Sulfur Diesel Fuel

From June 1, 2006 through May 31, 2010, facilities downstream of the refiner or importer must designate and maintain records of all volumes of fuel designated as 15 ppm sulfur highway diesel fuel, 500 ppm sulfur highway diesel fuel, or 500 ppm sulfur NRLM diesel fuel that they receive and deliver.

In many cases, we expect that downstream facilities will not change the designation of 500 ppm sulfur diesel fuel from NRLM diesel fuel to highway while the fuel is in their custody. However, to accommodate fluctuations in the demand for highway-designated versus NRLM-designated 500 ppm sulfur fuel, today's rule allows terminals and other distributors to change the designation of 500 ppm sulfur fuel from NRLM diesel fuel to highway diesel fuel on a daily basis, as long as the required volume balance is achieved over the compliance period.¹²⁴ Terminal operators must ensure that the running balance of total highway-designated fuel that they discharged from the beginning of today's program does not exceed the volume of highway fuel that they received since, and had in their possession at the beginning of today's program (adjusted for changes in inventory). This simple one-sided test allows 15 ppm sulfur highway diesel fuel to flow to 500 ppm sulfur highway diesel fuel (subject to anti-downgrading limits), 500 ppm sulfur NRLM diesel fuel, or heating oil. It also allows 500 ppm sulfur highway diesel fuel to flow to NRLM diesel fuel or heating oil. However, the flow of NRLM diesel fuel to highway diesel fuel must first have been offset by shifts from highway to NRLM diesel fuel. In this way we can have assurance that the 500 ppm sulfur fuel sold for highway purposes was in fact produced pursuant to the 80/20 requirements of the highway rule. Since any 500 ppm sulfur diesel fuel in the possession of parties downstream of the refiner at the beginning of today's program will be considered as highway diesel fuel, each custodian will begin today's program with a positive volumetric account balance regarding their input/output of highway-designated 500 ppm sulfur. Conformity with this requirement will be evaluated by EPA at the end of each quarterly compliance period.

In order to accommodate volumetric fluctuations due to such factors as thermal expansion of the fuel, facilities such as pipelines upstream of the terminal can use the same volumetric balance. However, since these facilities typically do not, and should not change designations, the compliance periods can be annual. In addition, to ensure that there are no significant redesignations, we are also requiring that the volume of highway-designated 500 ppm sulfur diesel fuel that a facility

¹²⁴ Any party is free to redesignate highway diesel fuel to NRLM diesel fuel or heating oil at any time. The required volume balance does not limit such designations.

discharges from its custody must be no greater than 102 percent of the volume of such fuel that it received during each annual compliance period. All parties downstream of the refiner, importer, or transmix processor also must demonstrate that over any given compliance period, they did not downgrade more than 20 percent of the 15 ppm highway diesel fuel that they received to 500 ppm sulfur highway diesel fuel.

From June 1, 2006 through May 31, 2010, distributors must maintain records regarding each transfer of a designated fuel into and out of their facility on a batch-by-batch basis. These records must include the EPA registration number of the source or recipient facility, and the volume of each designated fuel transfer. However, for transfers of dyed NRLM and highway diesel fuel on which taxes have been assessed, the recipient or source facility need not be specifically identified. In such cases, records must be kept regarding the total volume of dyed and tax assessed fuel that is received, discharged, and in inventory during each compliance period. After May 31, 2010, unique records for these designate and track provisions are no longer required, but the normal records and PTDs must still be kept regarding compliance with the fuel standards.

ii. Designation and Tracking of High Sulfur NRLM Diesel Fuel and Heating Oil

The requirements regarding the designation and tracking of heating oil and high sulfur or 500 ppm sulfur NRLM diesel fuel parallel those regarding the designation and tracking of 500 ppm sulfur highway and NRLM diesel fuel discussed above. However, the requirements described below pertain only to facilities not in the Northeast/Mid-Atlantic area or Alaska, and to facilities inside of the Northeast/Mid-Atlantic area that transport heating oil outside of the Northeast/Mid-Atlantic area.

From June 1, 2007 through May 31, 2010, facilities downstream of the refiner or importer must designate all high sulfur diesel fuel they distribute as NRLM diesel fuel and all heating oil they distribute as heating oil, and must keep records of all volumes of fuel designated as high sulfur NRLM diesel fuel or heating oil. In many cases, we expect that downstream facilities will not change the designation of diesel fuel from heating oil to high sulfur NRLM diesel fuel while the fuel is in their custody. However, today's final rule provides the flexibility to make this change in designation provided that

volume balance requirements for high sulfur NRLM diesel fuel are met.

The volume balance for heating oil requires that the volumes of high sulfur NRLM diesel fuel and heating oil received must be compared to the volumes of high sulfur NRLM diesel fuel and heating oil delivered over a compliance period. The volume of high sulfur NRLM diesel fuel may not increase by a greater proportion than the volume of heating oil over a compliance period. There are many reasons why the combined pool of high sulfur fuel will increase in volume such as the inevitable downgrades from 15 ppm and 500 ppm when these fuels are shipped by pipeline. The volume balance allows for this to occur while keeping fuel produced as heating oil from being shifted to NRLM diesel fuel. The volume balance calculation allows high sulfur NRLM diesel fuel and heating oil to increase proportionately, satisfying both needs. As discussed previously, high sulfur NRLM diesel fuel and heating oil compliance will be required on a quarterly basis for terminal facilities that add marker/dye (and are more likely to change designations on a day to day basis), while compliance for other entities (e.g., pipelines) will be on an annual basis. Compliance with the volume balance requirement is determined by comparing volumes received and delivered during that compliance period. There is no need to have a running total volume of high sulfur NRLM diesel fuel delivered from the beginning of the program since we do not expect any party will need to redesignate heating oil to high sulfur NRLM diesel fuel, even on a day-to-day basis. Further, we are not providing any tolerance since sufficient flexibility already exists due to the many sources of downgrade to heating oil.

Facilities must maintain records regarding each transfer of heating oil and high sulfur NRLM diesel fuel that they receive and discharge from June 1, 2007 through May 31, 2010 on a batch-by-batch basis.¹²⁵ These records must include the EPA registration number of the source or recipient facility, and the volume of each fuel transfer. However, for transfers of marked heating oil, the recipient or source facility need not be specifically identified. In such cases, records must be kept regarding the total volume of marked heating oil that is received, discharged, and in inventory during each compliance period. For transfers of dyed high sulfur NRLM diesel fuel from a truck loading rack, the specific recipients also do not need to

¹²⁵ As discussed in section V, these records must be kept for five years.

be identified. In such cases, records must be kept regarding the total volume of high sulfur NRLM diesel fuel that is received, discharged, and in inventory during each compliance period.

From June 1, 2010 through May 31, 2014, facilities downstream of the refiner or importer must continue to designate heating oil and any 500 ppm sulfur NRLM diesel fuel that they distribute. Beyond June 1 2014, they must designate 500 ppm sulfur LM diesel fuel in addition to heating oil. Designations for heating oil are subject to the volume balance requirements and records must be kept on the designations.

Beginning June 1, 2010, the volume balance requirement for heating oil is simply that the volume of heating oil may not decrease. As discussed previously, there are many reasons why the volume could increase. Consequently, if the volume decreases it would mean that heating oil is being shifted to NRLM or locomotive and marine uses, thereby allowing refiners to circumvent the NRLM diesel fuel sulfur standards. Given the likely increase in heating oil volume for other reasons, there should be ample flexibility provided with this one-sided test to account for minor variations due to volume swell/shrinkage related to temperature, meter differences, or other causes, so no additional tolerance or flexibility is necessary.

iii. Designation and Tracking of 500 ppm Sulfur NR and LM Diesel Fuel

The requirements regarding the designation and tracking of 500 ppm sulfur NR and LM diesel fuel parallel those regarding the designation and tracking of 500 ppm sulfur highway and NRLM diesel fuel discussed above. However, the requirements described below pertain only to facilities not in the Northeast/Mid-Atlantic area or Alaska, and to facilities inside of the Northeast/Mid-Atlantic area that transport 500 ppm sulfur NR and LM diesel fuel outside of the Northeast/Mid-Atlantic area.

From June 1, 2010 through May 31, 2012, facilities downstream of the refiner or importer must continue to designate 500 ppm sulfur NR and LM diesel fuel that they distribute, and must keep records of all volumes of fuel designated as these fuels. In many cases, we expect that downstream facilities will not change the designation of diesel fuel from 500 ppm sulfur LM to 500 ppm sulfur NR diesel fuel while the fuel is in their custody. However, today's final rule provides the flexibility to make this change in designation provided that volume balance

requirements for 500 ppm sulfur NR diesel fuel are met.

The volume balance for 500 ppm sulfur NR and LM diesel fuel requires that the volumes of 500 ppm sulfur NR and LM diesel fuel received must be compared to the volumes of 500 ppm sulfur NR and LM diesel fuel delivered over a compliance period. The volume of 500 ppm sulfur NR diesel fuel may not increase by a greater proportion than the volume of 500 ppm sulfur LM diesel fuel over a compliance period. The combined pool of 500 ppm sulfur diesel fuel may increase in volume such as the inevitable downgrades from 15 ppm and 500 ppm sulfur diesel fuel when these fuels are shipped by pipeline. The volume balance allows for this to occur while keeping fuel produced as 500 ppm sulfur LM diesel fuel from being shifted to NR fuel. The volume balance calculation allows 500 ppm sulfur NR and LM diesel fuel to increase proportionately, satisfying both needs. 500 ppm sulfur NR and LM diesel fuel compliance will be required on an annual basis, for terminal facilities as well as other entities. Compliance with the volume balance requirement is determined by comparing volumes received and delivered during that compliance period.

Facilities must maintain records regarding each transfer of 500 ppm sulfur NR and LM diesel fuel that they receive and discharge from June 1, 2010 through May 31, 2012 on a batch-by-batch basis. These records must include the EPA registration number of the source or recipient facility, and the volume of each fuel transfer. However, for transfers of marked 500 ppm sulfur LM diesel fuel, the recipient or source facility need not be specifically identified. In such cases, records must be kept regarding the total volume of marked 500 ppm sulfur LM diesel fuel that is received, discharged, and in inventory during each compliance period. For transfers of dyed 500 ppm sulfur NR diesel fuel from a truck loading rack, the specific recipients also do not need to be identified. In such cases, records must be kept regarding the total volume of 500 ppm sulfur NR diesel fuel that is received, discharged, and in inventory during each compliance period.

EPA plans to work closely with members of the diesel fuel refining and distribution industry, to provide clear and comprehensive guidance on what is expected of the various parties under the designate and track and volume balance provisions adopted in this rule. EPA invites suggestions from these parties on the most useful ways to provide such guidance.

d. Reporting Requirements

i. Compliance and Reporting Periods

We believe that any regulatory program should promote compliance and deter non-compliance. Today's program includes compliance and reporting provisions to deter noncompliance and to detect and correct instances of noncompliance in a timely fashion. Under today's program entities must submit to the Agency compliance reports containing information on the diesel fuel volumes they handle, separately by fuel designation category. Compliance with these volume designation and tracking requirements will be determined on an annual basis for refiners and pipelines and a quarterly basis for terminals during the first step of today's program. Compliance will be determined on an annual basis for everyone after 2010. To demonstrate compliance, refiners, pipelines, and terminals will be required to submit reports on a quarterly basis during the first step of today's program and then on an annual basis every year thereafter.

We are requiring the submission of volume reports on a quarterly basis during the first step of today's program for several reasons. First, and most importantly, today's program allows entities to change the designations of 500 ppm sulfur diesel fuel from NRLM diesel fuel to highway diesel fuel and heating oil to NRLM diesel fuel on a daily basis (provided that they later redesignate the same volume of 500 ppm diesel fuel from highway diesel fuel to NRLM diesel fuel and the same volume of NRLM diesel fuel to heating oil). Second, quarterly reporting coupled with quarterly compliance by terminals will constrain the magnitude of any noncompliance. Finally, during the start up of the designate and track system, there may also be a greater potential for errors in the transmission of records between custodians of designated fuels, in the calculations related to compliance with the volume account balance requirements, and in the materials provided in reports.

Today's program establishes quarterly compliance periods which are based on standard industry practices. Specifically, the quarterly compliance periods finalized in today's rule are as follows:

- 1st quarter: July 1–September 30;
- 2nd quarter: October 1–December 31;
- 3rd quarter: January 1–March 31;
- 4th quarter: April 1–June 30.

Where the start and end dates of the program do not line up with these dates, the quarters are lengthened or shortened

accordingly (e.g., June 1, 2007–September 30, 2007, and April 1, 2010–May 31, 2010). Quarterly reports are due two months following the end of the quarterly compliance period (i.e., December 1, March 1, June 1, and September 1). Annual compliance periods begin on July 1 and end June 30 of the following year. Again, certain annual compliance periods were lengthened or shortened to match the significant dates of the program (e.g., June 1, 2007–June 30, 2008). Annual reports are due by August 31 following the annual compliance period. For the sake of simplifying compliance and record keeping, the compliance periods for the highway final rule have been adjusted to match these.

Reports must be submitted electronically, or in a form which facilitates direct entry into an electronic database. Without reliance on an electronic database and reporting system to cross check and verify reported information, the designate and track provisions would become so cumbersome as to be virtually unenforceable by EPA staff given projected resource availability.

ii. Reporting Requirements During the First Step of Today's Program

During the first step of today's program, from June 1, 2007 through May 31, 2010, entities must report to EPA for each of their facilities regarding the total volume of each of the designated fuels that they receive from, or discharge to, another entity's facility in the fuel distribution system. If a facility is a refiner as well as a distributor (e.g., a blender of biodiesel or blendstocks from unfinished diesel fuel or heating oil or otherwise both accepts previously designated fuel and also produces fuel), it must also report both volumes produced and released to other entities in its capacity as refiner and also report the volumes received and released for each designation like any other terminal or pipeline.

For example, an entity that operates a pipeline may have multiple points where it discharges fuel, and at each of these points it may supply multiple terminals. The pipeline operator must report on the receipt of designated fuel from each party that transfers fuel to it, and on the designated fuel transferred by the pipeline at each discharge point which specifies the fuel transferred, separately for each of its terminal customers. Entities must report for each of their facilities the total volumes of the designated fuels that were either dyed red, marked, or on which taxes were assessed tax while in their custody. Reports regarding these volumes do not

need to include details on the recipients of the fuel (but product transfer documents must be kept to facilitate EPA's ability to compare the outgoing transfers and to fuel received).

Entities that handle only dyed NRLM diesel fuel, dyed and marked 500 ppm sulfur LM diesel fuel (2010–2012) and heating oil, or highway diesel fuel on which taxes have been assessed do not need to report to EPA. Information from such entities is not needed for compliance purposes, because there is no chance of violating the prohibitions against the shifting of fuel from one pool to another contained in today's rule without also violating either the requirement that highway diesel fuel contain no red dye, or the requirement that NRLM diesel fuel contain no heating oil marker. Furthermore, consistent with the highway rule, there are no periodic reporting requirements regarding the demonstration of compliance with the highway program's anti-downgrading requirements in today's rule. Maintenance of records should be sufficient for EPA to adequately monitor compliance with these requirements, as insufficient 15 ppm sulfur diesel fuel availability in an area should highlight potential anti-downgrading violations.

Quarterly reports from facilities downstream of the refinery and importer must also include data on the total volume of the designated fuels received, discharged, and in inventory during the quarterly reporting period. Using these data, the reporting party must demonstrate compliance with the volume account balance requirements regarding highway diesel fuel and high sulfur NRLM.

iii. Reporting Requirements During the Second Step of Today's Program

We believe that we may safely dispense with quarterly reporting and compliance evaluations starting June 1, 2010 and instead rely on annual reports. During the second step of today's rule, the designate and track requirements will be focused on preventing the use of heating oil in NRLM equipment, and during 2010–2012 preventing the use of 500 ppm sulfur LM diesel fuel in nonroad equipment. By 2010, all reporting parties in the system will have had experience in complying with the program's designate and track provisions. In addition, the Agency will have had ample experience in administering the system. Consequently, we expect that there will be few errors or omissions in reports and that EPA will have determined how best to detect and remedy instances of noncompliance. We believe an annual

reporting period is therefore sufficient and appropriate.

Beginning June 1, 2010, entities that produce, import, or take custody of 500 ppm sulfur NRLM diesel fuel, marked heating oil, or unmarked heating oil outside of the Northeast/Mid-Atlantic area and Alaska, must submit an annual report to EPA that provides summary information regarding the transfer of these fuels.¹²⁶ Entities must report for each of their facilities the total volume of each of these fuels that they received from, or discharge to, another entity's facility in the fuel distribution system during each annual compliance period. For batches of heating oil that are delivered marked, the reports do not need to indicate the entities to which the batches were delivered—only the total volume of marked heating oil delivered during each compliance period must be reported. If an entity only receives marked heating oil (*i.e.*, it does not receive any unmarked heating oil), it does not need to report at all. If a facility received marked heating oil in addition to unmarked heating oil, it must report the volume of marked heating oil separately and indicate the facility from which the marked heating oil was received.

Beginning June 1, 2010 to June 1, 2012, entities that produce, import, or take custody of 500 ppm sulfur NR and LM diesel fuel outside of the Northeast/Mid-Atlantic area and Alaska, must submit an annual report to EPA that provides summary information regarding the transfer of these fuels.¹²⁷ Entities must report for each of their facilities the total volume of each of these fuels that they received from, or discharge to, another entity's facility in the fuel distribution system during each annual compliance period. For batches of 500 ppm sulfur LM diesel fuel that are delivered marked, the reports do not need to indicate the entities to which the batches were delivered—only the total volume of marked 500 ppm sulfur LM diesel fuel delivered during each compliance period must be reported. If an entity only receives marked 500 ppm sulfur LM diesel fuel (*i.e.*, it does not receive any unmarked 500 ppm sulfur LM diesel fuel), it does not need to report at all. If a facility received marked in addition to unmarked 500 ppm sulfur LM diesel fuel, it must

¹²⁶ 500 ppm sulfur NR diesel fuel, and starting June 1, 2012, 500 ppm sulfur NRLM diesel fuel, is not permitted in the Northeast/Mid-Atlantic area and only in the State of Alaska in limited circumstances.

¹²⁷ During this time period, 500 ppm sulfur NR diesel fuel is not permitted in the Northeast/Mid-Atlantic area and only in the State of Alaska in limited circumstances.

report the volume of marked 500 ppm sulfur LM diesel fuel separately and indicate the facility from which the marked 500 ppm sulfur LM diesel fuel was received.

E. How Are State Diesel Fuel Programs Affected by the Sulfur Diesel Program?

Section 211(c)(4)(A) of the CAA prohibits states and political subdivisions of states from prescribing or attempting to enforce, for purposes of motor vehicle emission control, "any control or prohibition respecting any characteristic or component of a fuel or fuel additive in a motor vehicle or motor vehicle engine," if EPA has prescribed "a control or prohibition applicable to such characteristic or component of the fuel or fuel additive" under section 211(c)(1). This prohibition applies to all states except California, as explained in section 211(c)(4)(B). This express preemption provision in section 211(c)(4)(A) applies only to controls or prohibitions respecting any characteristics or components of fuels or fuel additives for motor vehicles or motor vehicle engines, that is, highway vehicles. It does not apply to controls or prohibitions respecting any characteristics or components of fuels or fuel additives for nonroad engines or nonroad vehicles.¹²⁸

Section 211(c)(4)(A) specifically mentions only controls respecting characteristics or components of fuel or fuel additives in a "motor vehicle or motor vehicle engine," adopted "for purposes of motor vehicle emissions control," and the definitions of motor vehicle and nonroad engines and vehicles in CAA section 216 are mutually exclusive. This is in contrast to sections 211(a) and (b), which specifically mention application to fuels or fuel additives used in nonroad engines or nonroad vehicles, and with section 211(c)(1) which refers to fuel used in motor vehicles or engines or nonroad engines or vehicles.

Thus, today's action does not preempt state controls or prohibitions respecting characteristics or components of fuel or fuel additives used in nonroad, locomotive, or marine engines or

¹²⁸ See 66 FR 36543, July 12, 2001 (notice proposing approval of Houston SIP revisions). See also letter from Carl Edlund, Director, Multimedia Planning and Permitting Division, U.S. Environmental Protection Agency, Region VI, to Jeffrey Saitas, Executive Director, Texas Natural Resources Conservation Commission, dated September 25, 2000, providing comments on proposed revisions to the Texas State Implementation Plan for the control of ozone, specifically the Post 99 Rate of Progress Plan and Attainment Demonstration for the Houston/Galveston area. This letter noted that preemption under section 211(c)(4) of the CAA did not apply to controls on nonroad diesel fuel.

nonroad, locomotive, or marine vehicles under the provisions of section 211(c)(4)(A). At the same time, a state control that regulates both highway fuel and nonroad fuel is preempted to the extent that the state control respects a characteristic or component of highway fuel regulated by EPA under section 211(c)(1).

A court may consider whether a state control for fuels or fuel additives used in nonroad engines or nonroad vehicles is implicitly preempted under the supremacy clause of the U.S. constitution. Courts have determined that a state law is preempted by federal law where the state requirement actually conflicts with federal law by preventing compliance with the federal requirement, or by standing as an obstacle to accomplishment of congressional objectives. A court could thus consider whether a given state standard for sulfur in nonroad, locomotive or marine diesel fuel is preempted if it places such significant cost and investment burdens on refiners that refiners cannot meet both state and federal requirements in time, or if the state control would otherwise meet the criteria for conflict preemption.

F. Technological Feasibility of the 500 and 15 ppm Sulfur Diesel Fuel Program

This section summarizes our assessment of the feasibility of refining and distributing 500 ppm NRLM diesel fuel starting in 2007 and 15 ppm nonroad diesel fuel in 2010 and locomotive and marine diesel fuel in 2012. Based on this evaluation, we believe it is technologically feasible for refiners and distributors to meet both sulfur standards in the lead time provided with the desulfurization technology available. We begin this section by describing the nonroad, locomotive and marine diesel fuel market and how these fuels differ from current highway diesel fuel. We discuss desulfurization technologies, both conventional and advanced, which are available for complying with the 500 ppm and 15 ppm NRLM standards. We then present what mix of technologies we believe will be used. Next we provide our analysis of the lead time for complying with either standard. Finally, we analyze the feasibility of distributing low sulfur NRLM diesel fuel. We refer the reader to the Final RIA for more details regarding these assessments.

1. What Is the Nonroad, Locomotive and Marine Diesel Fuel Market Today?

Nonroad, locomotive and marine (NRLM) engines almost exclusively use No. 2 distillate fuel. No. 2 distillate fuel is a class of fuel defined by its boiling

range. It boils at a higher average temperature than gasoline, No. 1 distillate, jet fuel and kerosene, and at a lower average temperature than residual fuel (or bunker fuel). ASTM defines three No. 2 distillate fuels: (1) Low sulfur No. 2 diesel fuel (No. 2-D); (2) high sulfur No. 2-D; and (3) No. 2 fuel oil.¹²⁹ Low sulfur No. 2-D fuel must contain 500 ppm sulfur or less, have a minimum cetane number of 40, and have a minimum cetane index limit of 40 (or a maximum aromatic content of 35 volume percent) (*i.e.*, meet the EPA standard for highway diesel fuel).¹³⁰ Both high sulfur No. 2-D and No. 2 fuel oil must contain no more than 5000 ppm sulfur,¹³¹ and currently averages 3000 ppm nationwide. The ASTM specification for high sulfur No. 2-D fuel also includes a minimum cetane number of 40. Practically, since most No. 2 fuel oil meets this minimum cetane number specification, pipelines which ship fuel fungibly need only carry one high sulfur No. 2 distillate fuel which meets both sets of specifications. Currently, nonroad, locomotive and marine engines can be and are fueled with both low and high sulfur No. 2-D fuels. If No. 1 distillate is blended into highway diesel fuel, as is sometimes done to prevent gelling in the winter, the final blend must meet the 500 ppm EPA cap.

No. 1 distillate (*e.g.*, jet fuel and kerosene) meets lower boiling point and viscosity specifications requirements than No. 2 distillate. No. 1 distillate, or any of these other similar boiling distillates, added to No. 2 NRLM distillate becomes NRLM diesel fuel and thus, must meet the applicable specifications for No. 2 distillate.

For the purpose of this rule, we split the No. 2 distillate market into three pieces, according to the sulfur standard which each must meet: (1) Highway diesel fuel, (2) NRLM diesel fuel, and heating oil, which is used in both furnaces and boilers, as well as in stationary diesel engines to generate power.

In the NPRM, EPA estimated current production and demand for NRLM fuel from studies conducted by the U.S. Energy Information Administration (EIA). We projected growth in nonroad fuel demand using EPA's NONROAD emission model. We based the growth in

¹²⁹ "Standard Specification for Diesel Fuel Oils," ASTM D 975-98b and "Standard Specifications for Fuel Oils," ASTM D 396-98.

¹³⁰ These ASTM requirements were formed after and are consistent with the EPA regulations for highway diesel fuel.

¹³¹ Some states, particularly those in the Northeast, limit the sulfur content of No. 2 fuel oil to 2000-3000 ppm.

locomotive and marine fuel demand from analyses supporting EPA's locomotive and marine engine rulemaking. These future levels of NRLM fuel demand differed from those implicit in our projection of the emission reductions associated with the rule, which were based primarily on EPA's NONROAD emission model. We pointed out this inconsistency in the rule and indicated that we would resolve this inconsistency for the final rule.

In their comments on the NPRM, the American Petroleum Institute (API), the Engine Manufacturers Association (EMA) and others highlighted this inconsistency and suggested that EPA resolve it by basing its projection of future NRLM fuel demand using information developed by EIA and not from the NONROAD emission model. API pointed to a lower estimate of nonroad fuel demand developed in a contracted study performed by Baker and O'Brien. A detailed analysis of these comments and additional technical analyses of distillate fuel demand are described in Section 4.6.3.1 of the Summary and Analysis document to this rule. In summary, we decided to continue using the NONROAD emission model to project the emission benefits of this rule. To eliminate the inconsistency in the NPRM, we also use the NONROAD model to determine demand for nonroad fuel and project the economic impacts of this final rule. However, the analyses presented in Section 4.6.3.1 of the Summary and Analysis document to this rule identified uncertainties in the current and future level of nonroad fuel demand. To insure that these uncertainties did not affect the outcome of this rulemaking process, we evaluate the emissions, costs and cost effectiveness of the standards contained in this rule using an alternative estimate of nonroad fuel demand derived from EIA information. This alternative analysis is presented in Appendix 8A of the Final RIA. In addition to use of the NONROAD model to project nonroad fuel demand, we also updated our projections of the production of and demand for highway fuel and heating oil using more recent versions of the same EIA reports used in the NPRM analysis.

In 2001, nationwide outside of California, nonroad diesel fuel comprised about 18 percent of all No. 2 distillate fuel, while locomotive and marine diesel fuel comprised about eight percent of all No. 2 distillate fuel. Diesel fuel consumed by highway vehicles/engines comprised about 56 percent of all No. 2 distillate fuel.

Heating oil comprised about 19 percent of No. 2 distillate. Because of limitations in the fuel distribution system and other factors, about 18 percent of all non-highway distillate met the 500 ppm highway diesel fuel cap. Thus, about 64 percent of No. 2 distillate pool met the 500 ppm sulfur cap, not just the 56 percent used in highway vehicles. We project that this spillover of highway fuel to the NRLM diesel fuel market will continue under the highway diesel fuel program. Thus, today's rule will only materially affect about 19 percent of today's distillate market. The remaining 17 percent of No. 2 distillate which is high sulfur heating oil is estimated to remain at higher sulfur levels.

This rule will also affect any No. 1 distillate which is blended into wintertime NRLM fuel. Because gelling can also be prevented through the use of pour point additives, the current and future level of this of No. 1 distillate blending is uncertain. However, the feasibility of desulfurizing and distributing this No. 1 distillate will also be addressed below.

2. What Technology Will Refiners Use To Meet the 500 ppm Sulfur Cap?

Refiners currently hydrotreat most or all of their distillate blendstocks using what is commonly referred to as "conventional" hydrotreating technology to meet the 500 ppm sulfur and cetane limits applicable to highway diesel fuel. This conventional technology has been available and in use for many years. U.S. refiners have nearly ten years of experience with this technology in producing highway diesel fuel. The distillate blendstocks comprising NRLM fuel do not differ substantially from those comprising highway diesel fuel. Thus, the technology to produce 500 ppm sulfur NRLM diesel fuel has clearly been demonstrated and optimized over the last decade. Additionally, this technology continues to evolve primarily through the development of more active catalysts and motivated by the 15 ppm cap applicable to most highway diesel fuel starting in 2006.

Several advanced desulfurization technologies are being developed and are discussed in more detail in the next section. However, the fact that none of these technologies have been demonstrated commercially for a typical catalyst life (*i.e.*, two years) makes it unlikely that they would be selected by many refiners for use in mid-2007. Also, these advanced technologies promise the greatest cost savings in achieving 15 ppm levels, rather than 500 ppm. These advanced technologies can also be combined with a conventional

hydrotreater to meet the 15 ppm standard in 2010 and 2012. EPA therefore projects that the 500 ppm sulfur cap NRLM standard will be met using conventional hydrotreating technology. We made this same projection in the NPRM and no comments to the contrary were received.

In some cases, refiners will also need to install or expand several ancillary processes related to sulfur removal (*e.g.*, hydrogen production and purification, sulfur processing, and sour water treatment). These technologies are all commercially demonstrated, as nearly all refiners already have such units.

3. Is the Leadtime Sufficient To Meet the 2007 500 ppm NRLM Sulfur Standard?

After the highway diesel fuel program is implemented, we project that 92 refineries in U.S. will be producing high sulfur distillate fuel. We project that 36 of these refineries will likely produce 500 ppm sulfur NRLM diesel fuel in 2007. Of those 36, 30 will have to build new hydrotreaters while the other 6 are expected to use existing hydrotreaters to produce 500 ppm NRLM diesel fuel.¹³² The remaining 56 refineries are projected to continue to produce high sulfur distillate fuel, with 26 of the 56 refineries producing heating oil. The other 30 refineries are owned by small refiners and will likely produce high sulfur NRLM diesel fuel. The 56 refineries continuing to produce high sulfur distillate will not have to add or modify any equipment to continue producing this fuel.

This rule will provide refiners and importers 37 months before they will have to begin producing 500 ppm NRLM diesel fuel on June 1, 2007. Our lead time analysis projects that 27–39 months are typically needed to design and construct a diesel fuel hydrotreater.¹³³ As discussed below, we believe that 37 months will be sufficient for all refiners of NRLM fuel.

Easing the task is the fact that we project that essentially all refiners will use conventional hydrotreating to comply with the 500 ppm sulfur NRLM diesel fuel cap. This technology has been used extensively for more than 10 years and its capabilities to process a wide range of diesel fuel blendstocks are well understood. Thus, the time necessary to apply this technology for a

specific refiner's situation should be relatively short.

Twenty-six out of the 36 refineries projected to produce 500 ppm NRLM diesel fuel in 2007 have indicated that they will produce highway diesel fuel in their highway diesel fuel pre-compliance reports, *see* RIA section 7.2.1.3.4.1, Table 7.2.1–38 and following discussion for description of these refineries. Thus, roughly 70% of the refiners likely to produce 500 ppm sulfur NRLM diesel fuel in 2007 are already well into their planning for meeting the 15 ppm highway diesel fuel standard, effective June 1, 2006. It is likely that these refiners have already chemically characterized their high sulfur diesel fuel blendstocks, as well as their highway diesel fuel, in assessing how to meet produce 15 ppm fuel. They will also have already assessed the various technologies for producing 15 ppm diesel fuel. This provides an extensive base of information on how to design a hydrotreater to produce 500 ppm NRLM fuel, as well as how to revamp this hydrotreater to produce 15 ppm NRLM diesel fuel in 2010 and 2012. Those refiners only producing high sulfur distillate fuel today will be able to take advantage of the significant experience that technology vendors have obtained in assisting refiners of highway diesel fuel meet the 15 ppm cap in 2006.

We also expect that roughly 20 percent of the 101 refineries in the U.S. and its territories will build a new hydrotreater to produce 15 ppm highway fuel. Those which also produce high sulfur distillate will be able to produce 500 ppm NRLM fuel with their existing highway hydrotreater. In 2007, we conservatively assumed that 20% of the 500 ppm NRLM production from refineries that produce highway and high sulfur distillate could be produced with these existing treaters at no capital costs (existing highway treater capacity available for 500 ppm NRLM production would be higher if based on highway treater capacity). Thus, in 2007 we project that four refineries will be able to use their recently idled highway treater due to building a new highway treater unit for 2006. Furthermore, the highway diesel program pre-compliance reports indicate that another 7 refineries currently producing 500 ppm highway fuel will likely leave the highway fuel market in 2006. We project that 2 of these would use their existing treater to produce 500 ppm NRLM with no investment costs. Another three of these 101 refineries produce relatively small volumes of high sulfur distillate compared to highway diesel fuel today. We project that they will be able to

¹³² These refiners have said that they will leave the highway market in 2006 in their pre-compliance reports for complying with the Highway Diesel Rule, thus freeing up their existing hydrotreaters to produce 500 ppm NRLM diesel fuel.

¹³³ "Highway Diesel Progress Review," USEPA, EPA420-R-02-016, June 2002. The leadtime analysis in the RIA can be found in section 5.3.

produce 500 ppm sulfur NRLM fuel from their high sulfur distillate with only minor modification to their existing highway diesel fuel hydrotreater.

Refiners not planning on producing 100 percent highway fuel in 2006 will also need some time to assess which distillate market in which to participate starting in 2007, NRLM or heating oil. While this is a decision which requires some amount of time for analysis, refiners also needed to assess what market they would participate in for the 1993 500 ppm highway diesel fuel sulfur cap. In all, we project that the task of producing 500 ppm sulfur NRLM fuel in 2007 will be less difficult than the task refiners faced with the implementation of the 500 ppm highway diesel fuel cap in 1993. Refiners had just over three years of lead time for complying with the 1993 500 ppm highway diesel fuel cap, as is the case here, and this proved sufficient.

No explicit comments were made by refiners on the lead time needed for complying with the proposed NRLM 500 ppm sulfur standard. However, their comments supported the two step approach, preferring it over a one step, 15 ppm NRLM cap starting in 2008.

4. What Technology Will Refiners Use To Meet the 15 ppm Sulfur Cap?

In the highway diesel rule, we projected that refiners producing 15 ppm fuel in 2006 would utilize extensions of conventional hydrotreating technology. We also projected that refiners first producing 15 ppm fuel in 2010 would use a mix of extensions of conventional and advanced technologies. Based on the refiners' highway pre-compliance reports, it appears that 95% of highway fuel could meet the 15 ppm cap in 2006. We expect that virtually all of this 15 ppm fuel will be produced with conventional hydrotreating. Thus, it appears that conventional hydrotreating will be used to produce the vast majority of 15 ppm highway diesel fuel.

In the nonroad NPRM, we projected that refiners would use advanced desulfurization technologies to produce 80 percent of 15 ppm nonroad diesel fuel in 2010, with the balance using conventional hydrotreating. At the time of the NPRM, all of the advanced technologies appeared to be progressing rapidly. Since the proposal, we have learned that a couple of these technologies, Unipure and S-Zorb, are not going to be commercially demonstrated as soon as expected. However, one refiner is already using Process Dynamics' IsoTherming technology to commercially produce 15

ppm diesel fuel. Thus, we continue to believe that advanced technologies will be used to produce a large percentage of 15 ppm NRLM fuel. However, the number of advanced technologies used may be smaller. Because of the more limited choices, we project that the penetration of advanced technologies will be only 60 percent. The remainder of this section discusses the production of 15 ppm diesel fuel using conventional and advanced technologies.

One approach to produce 15 ppm NRLM fuel would be to revamp the conventional hydrotreater built to produce 500 ppm NRLM fuel in 2007. Knowing that the 500 ppm NRLM cap will only be in effect for three years for nonroad refiners and five years for locomotive and marine refiners (four years for small refiners), we expect that refiners will design their 500 ppm hydrotreater to allow the production of 15 ppm fuel through the addition of reactor volume or a second hydrotreating stage. Refiners might also shift to a more active catalyst in the existing reactor, as the life of that catalyst might be nearing its end. Equipment to further purify its hydrogen supply could also be added. Producing 15 ppm NRLM fuel via these steps will be feasible as they are essentially the same steps refiners will be using in 2006 to produce 15 ppm highway diesel fuel.

EPA recently reviewed the progress being made by refining technology vendors and refiners in meeting the 2006 highway diesel sulfur cap.¹³⁴ All evidence available confirms EPA's projection that conventional hydrotreating will be capable of producing diesel fuel containing less than 10 ppm sulfur. Furthermore, as part of the highway program's reporting requirements, refiners are required to report their progress in complying with the 15 ppm highway diesel fuel standard. In those reports they indicated that they primarily will be applying extensions of conventional hydrotreating. NRLM fuel refiners will have the added advantage of being able to design their 500 ppm hydrotreater with the production of 15 ppm fuel in mind. Additionally, refiners producing 15 ppm NRLM fuel will be able to take advantage of the experience gained from those producing 15 ppm highway fuel.

As mentioned above, several advanced technologies are presently being developed to produce 15 ppm diesel fuel at lower cost. One of these advanced technologies, Process

Dynamics IsoTherming, improves the contact between hydrogen, diesel fuel and the desulfurization catalyst. The IsoTherming process dissolves the hydrogen in the liquid fuel phase prior to passing the liquid over the catalyst, eliminating the need for a two-phase (gas and liquid) reactor. The liquid, plug flow reactor design also avoids the poor liquid distribution over the catalyst bed often present in a two-phase reactor design. Process Dynamics projects that their IsoTherming process could reduce the hydrotreater volume required to achieve sub-15 ppm sulfur levels by roughly a factor of two.

Process Dynamics has already built a commercial-sized demonstration unit (5000 barrels per day) at a refinery in New Mexico. They have been operating the unit since September 2002, and demonstrating the capability to meet a 15 ppm cap since the spring of 2003. Thus, refiners will have 4–5 years of operating data on this process before they would have to select a technology to produce 15 ppm nonroad diesel fuel in 2010, and 6–7 years before producing 15 ppm locomotive and marine diesel fuel in 2012. This should be more than sufficient for essentially all refiners to consider this process for 2010 or 2012. Based on information received from Process Dynamics, we estimate that this technology could reduce the cost of meeting the 15 ppm cap for many refiners by about 30 percent. This savings arises from a smaller reactor, less catalyst and avoiding the need for a recycle gas compressor and reactor distributor. Refineries facing poorer economies of scale, such as small refineries, would particularly benefit from this desulfurization process.

A second process being developed to produce 15 ppm diesel fuel is the Unipure oxidation process. This process oxidizes the sulfur in distillate molecules, facilitating its removal. Unipure Corporation installed a small (50 barrels per day), continuous flow demonstration unit at Valero's Krotz Spring refinery in the spring of 2003. It appears that this technology could reduce the cost of producing 15 ppm diesel fuel for some refiners compared to conventional hydrotreating. However, the small size of the demonstration unit may make the risk associated with a new technology too large. Thus, we believe that this technology needs be demonstrated further before most refiners will seriously consider it for commercial application. This technology, however, may be ideal for use at transmix processing plants or large terminals to reprocess 15 ppm diesel fuel which have become contaminated during shipment. We

¹³⁴ "Highway Diesel Progress Review," USEPA, EPA420-R-02-016, June 2002.

discuss this distillate downgrade in greater detail in Section VI.A.2 of this preamble. This oxidation process avoids the need for high pressure hydrogen, which is usually not economically available at these smaller facilities.

Finally, Conoco-Phillips has adapted their S-Zorb adsorption technology which was originally designed for gasoline desulfurization, for diesel fuel desulfurization. At the time of the NPRM, Conoco-Phillips had signed 23 licensing agreements with refiners in North America regarding the use of S-Zorb to comply with the Tier 2 gasoline sulfur standards. Furthermore, Conoco-Phillips had plans for the quick installation of an S-Zorb unit to demonstrate the production of 15 ppm diesel fuel. However, we have since learned that Conoco-Phillips has dropped its plans to build a commercial demonstration unit for desulfurizing diesel fuel. Without a commercial unit operating in the 2006 time frame, we do not believe that many refiners will seriously consider S-Zorb to produce 15 ppm NRLM diesel fuel in 2010 and 2012.

Due to the fact that the Process Dynamics IsoTherming process is already operating commercially and operational data indicate a 30 percent reduction in the cost of producing 15 ppm fuel relative to conventional hydrotreating, we project that 60 percent of the new volume of 15 ppm NRLM diesel fuel will be produced using this technology. We project that the remaining 40 percent of 15 ppm NRLM diesel fuel will use extensions of conventional hydrotreating. We assume this 60/40 mix of Isotherming and extensions of conventional hydrotreating, respectively, for 2010, 2012 and even for 2014 when the small refiners exemptions expire.

API commented that the advanced desulfurization technologies have not been commercially demonstrated and thus should not be used as the basis for estimating the cost of desulfurizing NRLM diesel fuel to 15 ppm. While this is true for the Unipure oxidation and Conoco-Phillips' S-Zorb processes, the Process Dynamics IsoTherming process has been commercially demonstrated. It is therefore appropriate for use as a partial basis for the refining costs associated with today's final rule. To indicate the effect that this projection for the use of IsoTherming has on the rule's cost, in Section 7.2.2 of the Final RIA, we estimate the cost of producing 15 ppm NRLM fuel with only the use of conventional hydrotreating technology.

5. Is the Leadtime Sufficient To Meet the 2010 and 2012 15 ppm NRLM Sulfur Cap?

We project that 32 refineries will produce 15 ppm nonroad diesel fuel in 2010, with two of these being owned by small refiners. In 2012, we project that 15 refineries will produce 15 ppm locomotive and marine diesel fuel. We project that an additional 15 refineries will produce 500 ppm nonroad diesel fuel in 2010 under the small refiner provisions included in the today's final rule. Then in 2014, we project that the 15 refineries exempted under the small refiner provisions will begin producing 15 ppm NRLM diesel fuel in 2014.

The timing of this rule provides refiners and importers with more than six years before they will have to produce 15 ppm nonroad diesel fuel, and two years more for producing 15 ppm locomotive and marine diesel fuel. Our leadtime analysis, which is presented in Section 5.4.2 of the Final RIA, projects that 30–39 months are typically needed to design and construct a diesel fuel hydrotreater, perhaps less if it is a Process Dynamics unit. Thus, refiners will have about three years before they would have to begin detailed design and construction for 2010, and five years before 2012. This will allow sufficient time to consult with vendors, test their diesel fuel in pilot plants to assess the difficulty of its desulfurization via a variety of technologies, and to select its technology for 2010 and 2012. In addition, these refiners will also have the chance to observe the performance of the hydrotreaters being used to produce 15 ppm highway diesel fuel for at least one year for those complying in 2010, and two years more for those complying in 2012. While not a full catalyst cycle, any unusual degradation in catalyst performance should be apparent within the first year. Based on the pre-compliance reports, some refineries in the U.S. will be producing 15 ppm sulfur highway diesel fuel earlier than 2006. Some refineries are expected to produce complying fuel earlier than the compliance date in Europe as well. The refineries which are complying early will accrue experience earlier and longer providing refiners a better sense of the reliability of producing 15 ppm diesel fuel. Thus, we project that the 2010 and 2012 start dates will allow refiners to be quite certain that the designs they select in mid-2007 will perform adequately in 2010 and 2012.

In addition, refiners will have three to four years or more to observe the performance of the Process Dynamics

IsoTherming process before having to make their technology selections for 2010 and 2012. This should be more than adequate to fully access the costs and capabilities of this technology for all but the most cautious refiners.

Considering the amount of leadtime available and the desulfurization technologies which will be available and proven for complying with a 15 ppm sulfur standard, we do not expect that the leadtime for complying with the 15 ppm NRLM cap standard in 2010 and 2012 will be an issue for refiners.

6. Feasibility of Distributing 500 and 15 ppm NRLM Fuel

There are two considerations with respect to the feasibility of distributing non-highway diesel fuels meeting the sulfur standards in today's rule. The first pertains to whether sulfur contamination can be adequately managed throughout the distribution system so that fuel delivered to the end-user does not exceed the specified maximum sulfur concentration. The second pertains to the physical limitations of the system to accommodate any additional segregation of product grades.

a. Limiting Sulfur Contamination

With respect to limiting sulfur contamination during distribution, the physical hardware and distribution practices for non-highway diesel fuel do not differ significantly from those for highway diesel fuel. Therefore, we do not anticipate any new issues with respect to limiting sulfur contamination during the distribution of non-highway fuel that would not have already been accounted for in distributing highway diesel fuel. Highway diesel fuel has been required to meet a 500 ppm sulfur standard since 1993. Thus, we expect that limiting contamination during the distribution of 500 ppm non-highway diesel engine fuel can be readily accomplished by the industry. This applies to locomotive and marine diesel fuel as well as nonroad diesel fuel.

In the highway diesel rule, EPA acknowledged that meeting a 15 ppm sulfur specification would pose a substantial new challenge to the distribution system. Refiners, pipelines, and terminals would have to pay careful attention to and eliminate any potential sources of contamination in the system (e.g., tank bottoms, deal legs in pipelines, leaking valves, interface cuts, etc.). In addition, bulk plant operators and delivery truck operators would have to carefully observe recommended industry practices to limit contamination, including practices as simple as cleaning out transfer hoses,

proper sequencing of fuel deliveries, and parking on a level surface when draining the storage tank. Due to the need to prepare for compliance with the highway diesel program, we anticipate that issues related to limiting sulfur contamination during the distribution of 15 ppm NRLM diesel fuel will be resolved well in advance of the 2010 and 2012 implementation dates. We are not aware of any additional issues that might arise unique to NRLM diesel fuel. If anything we anticipate limiting contamination will become easier as batch sizes are allowed to increase and potential sources of contamination decrease as more and more of the diesel pool turns over to 500 and 15 ppm sulfur. Industry representatives acknowledge that the task can be accomplished. However, they are still in the process of identifying all of the measures that will need to be taken.

b. Potential Need for Additional Product Segregation

As discussed in section IV.D, we have designed the NRLM diesel fuel program to minimize the need for additional product segregation and the feasibility and cost issues associated with it. This final rule allows for the fungible distribution of 500 ppm highway and 500 ppm sulfur NRLM diesel fuel in 2007, and 15 ppm highway and 15 ppm NR diesel fuel in 2010 and 15 ppm NRLM diesel fuel in 2012, up until the point where NRLM, LM, or nonroad fuel must be dyed for IRS excise tax purposes. We proposed that heating oil would be required to be segregated throughout the distribution system by the use of a marker added at the refineries from 2007 through 2010. We received comments that addition of the marker at the refinery would cause significant concerns regarding potential marker contamination in the jet fuel. In responding to these and other comments, we have chosen to adopt a designate and track system of ensuring refiner compliance with desulfurization requirements (*see* IV.D.). This allows the point of marker addition to be moved downstream to the terminal where such contamination concerns are minimal. As a result heating oil and high-sulfur NRLM will also be fungible in the distribution system up to the point where the fuel marker must be added at the terminal.¹³⁵

The design of today's fuel program eliminates any potential feasibility issues associated with the need for

¹³⁵ The fuel marker requirements only apply outside of the Northeast/Mid-Atlantic area. Inside the Northeast/Mid-Atlantic area, high sulfur NRLM cannot be sold to end users. *See* section IV.D for a detailed discussion of the fuel marker provisions.

product segregation. This is not to say that additional steps will not have to be taken. However, this program will result in only a limited number of entities in the distribution system choosing to add new tankage due to new product segregation. Bulk plants in areas of the country where heating oil is expected to remain in the market will have to decide whether to add tankage to distribute both heating oil and 500 ppm sulfur NRLM fuel. Terminal operators commented that the proposed presence of a fuel marker in heating oil would make it impossible for them to blend 500 ppm sulfur diesel from 15 ppm sulfur and high sulfur fuels. They related that this ability would be important to certain terminal operators who would not have the storage facilities available for three grades of diesel fuel, but would still not wish to forgo selling 500 ppm diesel fuel.¹³⁶ Today's rule allows the required marker to be added to heating oil before it leaves the terminal (*see* section IV.D of this preamble). Therefore, terminals will be able to blend 500 ppm diesel from 15 ppm and high sulfur diesel fuels, provided they fulfill all of the responsibilities associated with acting as a fuel refiner (*see* section V of this preamble).¹³⁷ However, because this will be a relatively costly way of producing 500 ppm diesel fuel, we do not expect that the practice will be widespread. In all other cases we anticipate segments of the distribution system will choose to avoid any fuel segregation costs by limiting the range of sulfur grades they choose to carry, just as they do today. Regardless, however, the costs and impacts of these choices are small. A more detailed explanation of this assessment can be found in chapter 7 of the RIA.

A limited volume of 500 ppm sulfur diesel fuel is projected to be produced downstream due to interface mixing in the distribution system (*see* section IV.A).¹³⁸ Fuel from these sources is currently sold into the NRLM and heating oil markets. The implementation of the 15 ppm sulfur standard for NR diesel fuel in 2010 and for LM diesel fuel in 2012 raises the concern that the heating oil market might be insufficient to absorb all such downstream 500 ppm sulfur diesel fuel

¹³⁶ 15 ppm diesel fuel and high sulfur heating oil will be the largest volume products at such terminals.

¹³⁷ The definition of a refiner includes persons who produce highway or NRLM diesel fuel by blending.

¹³⁸ This fuel will be produced by transmix processors and at terminals by segregating the pipeline interface between 15 ppm diesel fuel and jet fuel.

in areas outside of the Northeast (where most heating oil is used). If the market for this fuel was limited, it would have to be trucked back to a refinery to be desulfurized which could raise significant logistical and cost issues. Consequently, today's rule provides that 500 ppm sulfur diesel fuel produced due to interface mixing can continue to be used in nonroad equipment until 2014 (subject to specific sulfur requirements for new equipment), and in locomotive and marine engines indefinitely.¹³⁹ These provisions ensure that there will be a sufficient market for such 500 ppm sulfur diesel fuel.

G. What Are the Potential Impacts of the 15 ppm Sulfur Diesel Program on Lubricity and Other Fuel Properties?

1. What Is Lubricity and Why Might It Be a Concern?

Engine manufacturers and owner/operators depend on diesel fuel lubricity properties to lubricate and protect moving parts within fuel pumps and injection systems for reliable performance. Unit injector systems and in-line pumps, commonly used in diesel engines, are actuated by cams lubricated with crankcase oil, and have minimal sensitivity to fuel lubricity. However, rotary and distributor type pumps, commonly used in light and medium-duty diesel engines, are completely fuel lubricated, resulting in high sensitivity to fuel lubricity. The types of fuel pumps and injection systems used in nonroad diesel engines are the same as those used in highway diesel vehicles. Consequently, nonroad and highway diesel engines share the same need for adequate fuel lubricity to maintain fuel pump and injection system durability.

Diesel fuel lubricity concerns were first highlighted for private and commercial vehicles during the initial implementation of the federal 500 ppm sulfur highway diesel program and the state of California's diesel program. The Department of Defense (DoD) also has a longstanding concern regarding the lubricity of distillate fuels used in its equipment as evidenced by the implementation of its own fuel lubricity improver performance specification in 1989.¹⁴⁰ The diesel fuel requirements in the state of California differed from the

¹³⁹ While today's rule does not contain an end date for the downstream distribution of 500 ppm sulfur locomotive and marine fuel, we will review the appropriateness of allowing this flexibility based on experience gained from implementation of the 15 ppm sulfur NRLM diesel fuel standard. We expect to conduct such an evaluation in 2011.

¹⁴⁰ DoD Performance Specification, Inhibitor, Corrosion/Lubricity Improver, Fuel Soluble, MIL-PRF-25017F, 10 November 1997, Superseding MIL-I-25017E, 15 June 1989.

federal requirements by substantially restricting the aromatic content of diesel fuel which requires more severe hydrotreating than reducing the sulfur content to meet a 500 ppm standard.¹⁴¹ Consequently, concerns regarding diesel fuel lubricity have primarily been associated with California diesel fuel and some California refiners treat their diesel fuel with a lubricity additive as needed. Outside of California, hydrotreating to meet the current 500 ppm sulfur specification does not typically result in a substantial reduction of lubricity. Diesel fuels outside of California seldom require the use of a lubricity additive. Therefore, we anticipate only a marginal increase in the use of lubricity additives in NRLM diesel fuel meeting the 500 ppm sulfur standard for 2007.¹⁴² Today's action requires diesel fuel used in nonroad, locomotive, and marine diesel engines to meet a 15 ppm sulfur standard in 2010 and 2012, respectively. Based on the following discussion, we believe that the increase in the use of lubricity additives in 15 ppm sulfur NRLM diesel fuel would be the same as that estimated for 15 ppm highway diesel fuel.

The state of California currently requires the same standards for diesel fuel used in nonroad equipment as in highway equipment. Outside of California, highway diesel fuel is often used in nonroad equipment when logistical constraints or market influences in the fuel distribution system limit the availability of high sulfur fuel. Thus, for nearly a decade nonroad equipment has been using federal 500 ppm sulfur diesel fuel and California diesel fuel, some of which may have been treated with lubricity additives. During this time, there has been no indication that the level of diesel lubricity needed for fuel used in nonroad engines differs substantially from the level needed for fuel used in highway diesel engines.

Blending small amounts of lubricity-enhancing additives increases the lubricity of poor-lubricity fuels to acceptable levels. These additives are available in today's market, are effective, and are in widespread use around the world. Among the available additives, biodiesel has been suggested as one potential means for increasing

the lubricity of conventional diesel fuel. Indications are that low concentrations of biodiesel might be sufficient to raise the lubricity to acceptable levels. Biodiesel is a renewable fuel made from agricultural sources such as soybean oil, peanut oil and other vegetable oils as well as rendered and animal fats and recycled cooking oils. Biodiesel generally contains very low amounts of sulfur, which is an attractive characteristic for use in diesel engines using advanced aftertreatment systems. Additionally, biodiesel, by virtue of its lubricity properties, may be a good alternative to additives currently used to ensure adequate fuel lubricity. According to the U.S. Department of Agriculture, there is a current capacity to produce 100 million gallons annually. Thus, we believe that biodiesel is a feasible technology that could help support today's clean diesel fuel program.

Research remains to be performed to better understand which fuel components are most responsible for lubricity. Consequently, it is unclear whether and to what degree the sulfur standards for NRLM diesel fuel will impact fuel lubricity. Nevertheless, there is evidence that the typical process used to remove sulfur from diesel fuel "hydrotreating" can impact lubricity depending on the severity of the treatment process and characteristics of the crude. We expect that hydrotreating will be the predominant process used to reduce the sulfur content of NRLM diesel fuel to meet the 500 ppm sulfur standard during the first step of the program. Similarly, we project that both conventional hydrotreating and the Linde Isotherming process will be used to meet the 15 ppm sulfur standard for NRLM diesel fuel.

Based on our comparison of the blendstocks and processes used to manufacture non-highway diesel fuels, we believe that the potential decrease in the lubricity of these fuels from hydrotreating that might result from the sulfur standards should be approximately the same as that experienced in desulfurizing highway diesel fuel.¹⁴³ To provide a conservative, high cost estimate, we assumed that the potential impact on fuel lubricity from the use of the new desulfurization processes would be the same as that experienced when hydrotreating diesel fuel to meet a 15 ppm sulfur standard. Given that the requirements for fuel lubricity in

highway and nonroad engines are the same, and the potential decrease in lubricity from desulfurization of NRLM diesel fuel would be no greater than that experienced in desulfurizing highway diesel fuel, we estimate that the potential need for lubricity additives in NRLM diesel fuel under today's action would be the same as that for highway diesel fuel meeting the same sulfur standard.

a. Farm and Mining Equipment

The types of fuel pumps and injection systems used in the nonroad diesel engines found in farm and mining equipment are similar to those used in highway diesel vehicles.¹⁴⁴ The hydrotreating process for generating 500 ppm diesel fuel will not adversely effect fuel injection equipment in farm and mining equipment based on the use of comparable injection systems in highway diesel vehicles. We believe that the use of lubricity additives in 15 ppm sulfur NRLM diesel fuel will be required and result in adequate protection of fuel injection equipment and is similar to that needed for 15 ppm sulfur highway diesel fuel.

b. Locomotives

One of the locomotive manufacturers expressed concern in its comments that low sulfur fuel might damage existing locomotives. However, the manufacturer provided no evidence to show that such damage would likely occur. Locomotives already use a significant amount of low sulfur fuel, especially in California, and we have not seen any evidence of sulfur-related problems. The railroads expressed a similar concern, but acknowledged that any potential problems would be manageable with sufficient lead time. At this time, we see no reason for any special concern related to locomotives using low sulfur fuel.

2. A Voluntary Approach on Lubricity

In the United States, there is no government or industry standard for diesel fuel lubricity. Therefore, specifications for lubricity are determined by the market. Since the beginning of the 500 ppm sulfur highway diesel program in 1993, refiners, engine manufacturers, engine component manufacturers, and the military have been working with ASTM

¹⁴¹ Chevron Products Diesel Fuel Technical Review provides a discussion of the impacts on fuel lubricity of current diesel fuel compositional requirements in California versus the rest of the nation; see <http://www.chevron.com/prodserv/fuels/bulletin/diesel/12%5F7%5F2%5Ff.htm>.

¹⁴² The cost from the increased use of lubricity additives in 500 ppm NRLM diesel fuel in 2007 and in 15 ppm nonroad diesel fuel in 2010 and locomotive and marine diesel fuel in 2012 is discussed in section VI of this preamble.

¹⁴³ See chapter 5 of the RIA for a discussion of the potential impacts on fuel lubricity of this proposal.

¹⁴⁴ Nonroad and highway diesel engines meeting similar emissions standards use similar fuel systems provided by common suppliers. For example, a nonroad engine meeting the 2001 Tier 2 nonroad diesel engine emission standards would have the same fuel system as a highway diesel engine meeting the 1998 highway diesel engine emissions standards.

to develop protocols and standards for diesel fuel lubricity in its D 975 specifications for diesel fuel. ASTM is working towards a single lubricity specification that is applicable to all diesel fuel used in any type of engine. Although ASTM has not yet adopted specific protocols and standards, refiners that supply the U.S. market have been treating diesel fuel with lubricity additives on a batch by batch basis, when poor lubricity fuel is produced. ASTM's target implementation date for this specification is January 1, 2005.

The potential need for lubricity additives in diesel fuel meeting a 15 ppm sulfur specification was evaluated during the development of EPA's highway diesel rule. In response to the proposed highway diesel rule, all comments submitted regarding lubricity either stated or implied that the proposed sulfur standard of 15 ppm would likely cause the refined fuel to have lubricity characteristics that would be inadequate to protect fuel injection equipment, and that mitigation measures such as lubricity additives would be necessary. However, the commenters suggested varied approaches for addressing lubricity. For example, some suggested that we need to establish a lubricity requirement by regulation while others suggested that the current voluntary, market based system would be adequate. The Department of Defense recommended that we encourage the industry (ASTM) to adopt lubricity protocols and standards before the 2006 implementation date of the 15 ppm sulfur standard for highway diesel fuel.

The final highway diesel rule did not establish a lubricity standard for highway diesel fuel. We believe the issues related to the need for diesel lubricity in fuel used in nonroad diesel engines are substantially the same as those related to the need for diesel lubricity for highway engines. Consequently, we expect the same industry-based voluntary approach to ensuring adequate lubricity in nonroad diesel fuels that we recognized for highway diesel fuel. We believe the best approach is to allow the market to address the lubricity issue in the most economical manner, while avoiding an additional regulatory scheme. A voluntary approach should provide adequate customer protection from engine failures due to low lubricity, while providing the maximum flexibility for the industry. This approach would be a continuation of current industry practices for diesel fuel produced to meet the current federal and California 500 ppm sulfur highway

diesel fuel specifications, and benefits from the considerable experience gained since 1993. It would also include any new specifications and test procedures that we expect would be adopted by ASTM regarding lubricity of NRLM diesel fuel quality.

In any event, this is an issue that will be resolved to meet the demands of the highway diesel market, and whatever resolution is reached for highway diesel fuel could be applied to NRLM diesel fuel with sufficient advance notice. We are continuing to participate in the ASTM Diesel Fuel Lubricity Task Force¹⁴⁵ and will assist their efforts to finalize a lubricity standard. We are hopeful that ASTM can reach a consensus this summer at the next meeting of the ASTM's Lubricity Task Force. If for some reason ASTM does not take action to set a lubricity specification, EPA will consider taking appropriate action to ensure 15 ppm sulfur diesel fuel has adequate lubricity.

3. What Other Impact Would Today's Actions Have on the Performance of Diesel and Other Fuels?

We do not expect that the fuel program finalized today will have any negative impacts on the performance of diesel engines in the existing fleet which would use the fuels regulated today.

While the process of lowering sulfur levels to 500 ppm does lower polynuclear aromatic hydrocarbons (PNAs) and total aromatics in general, it does not achieve the near-zero levels previously seen in California. The 15 ppm sulfur standard will further reduce PNAs, however, in most diesel fuel, there will still be PNAs present. Furthermore, since the 1990's, diesel engine manufacturers have switched to alternative materials (such as Viton), which do not experience leakage when PNAs are reduced. We believe that there will be no issues with leaking fuel pump O-rings with the changes in diesel fuel sulfur levels required by this rulemaking.

The moderate reduction in PNAs and total aromatics associated with the hydrotreating of diesel fuel will tend to increase the cetane index and number of diesel fuel. This will improve the driveability of vehicles operating on this higher cetane diesel fuel.

We do not expect any negative impacts on other fuels, such as jet fuel or heating oil. We do expect that the sulfur levels of heating oil may decrease because of this rulemaking. Beginning in mid-2007, we expect that controlling NRLM diesel fuel to 500 ppm sulfur will

lead many pipelines to discontinue carrying high sulfur heating oil as a separate grade. In areas served by these pipelines, heating oil users will likely switch to 500 ppm sulfur diesel fuel. This will reduce emissions of SO₂ and sulfate PM from furnaces and boilers fueled with heating oil. The primary exception to this will likely be the Northeast, where a distinct higher sulfur heating oil will still be distributed as a separate fuel. Also, we expect that a small volume of moderate sulfur distillate fuel will be created during distribution from the mixing of low sulfur diesel fuels and higher sulfur fuels, such as jet fuel in the pipeline interface. Such moderate sulfur distillate will often be sold by the terminal as high sulfur heating oil, but in fact its sulfur level will be lower than that normally sold as heating oil.

H. Refinery Air Permitting

Prior to beginning diesel desulfurization projects, some refineries may be required to obtain a preconstruction permit, under the New Source Review (NSR) program, from the applicable state/local air pollution control agency.¹⁴⁶ We believe that today's program provides sufficient lead time for refiners to obtain any necessary NSR permits well in advance of the applicable compliance dates.

Given that today's diesel sulfur program provides roughly three years of lead time before the 500 ppm standard takes effect, we believe refiners will have time to obtain any necessary preconstruction permits. In addition, the experience gained by many refineries to obtain the preconstruction permits needed to comply with the Tier 2 and highway diesel fuel programs should benefit them in obtaining the necessary permits to comply with today's new diesel fuel requirements. Nevertheless, we believe it is reasonable to continue our efforts under the Tier 2 and highway diesel fuel programs, to help states in facilitating the issuance of permits under the NRLM diesel fuel sulfur program whenever such assistance may be needed and requested. We anticipate that such assistance may include both technical

¹⁴⁶ Hydrotreating diesel fuel involves the use of process heaters, which have the potential to emit pollutants associated with combustion, such as NO_x, PM, CO and SO₂. In addition, reconfiguring refinery processes to add desulfurization equipment could increase fugitive VOC emissions. The emissions increases associated with diesel desulfurization would vary widely from refinery to refinery, depending on many source-specific factors, such as crude oil supply, refinery configuration, type of desulfurization technology, amount of diesel fuel produced, and type of fuel used to fire the process heaters.

¹⁴⁵ ASTM sub committee D02.E0.

and procedural assistance as would be provided by the appropriate EPA Regional and Headquarters offices. Finally, to facilitate the processing of permits, we encourage refineries to begin discussions with permitting agencies and to submit permit applications as early as possible.

V. Nonroad, Locomotive and Marine Diesel Fuel Program: Details of the Compliance and Enforcement Provisions

As with earlier fuel programs, we have developed a comprehensive set of compliance and enforcement provisions designed to promote effective and efficient implementation of this fuel program and thus to achieve the full environmental potential of the program. The compliance provisions under today's final rule are designed to ensure that nonroad, locomotive, and marine diesel fuel sulfur content requirements are met throughout the distribution system, from the refiner or importer through to the end user, subject to certain provisions applicable during the early transition years. Section IV above describes our program for the reduction of sulfur in nonroad, locomotive and marine (NRLM) diesel fuel including the standards and basic design of the compliance and enforcement program. This section contains additional details regarding the compliance and assurance program. The provisions discussed in this section fall into several broad categories:

- Special fuel provisions and exemptions;
- Additional provisions applicable to refiners and importers;
- Additional provisions applicable to parties downstream of the refinery or importer;
- Special provisions regarding additives, kerosene, and the prohibition against the use of motor oil in fuel;
- Fuel testing and sampling requirements;
- Records required to be kept, including those applying under the designate and track, credit provisions, small refiner, and refiner hardship provisions;
- Reporting requirements;
- Exemptions from the program;
- Provisions concerning liability, defenses, and penalties for noncompliance; and
- The selection of the marker for heating oil and 500 ppm sulfur LM diesel fuel. (The specific requirements with respect to heating oil and 500 ppm sulfur LM diesel fuel inside and outside of the Northeast/Mid-Atlantic Area are discussed in section IV.D.)

A. Special Fuel Provisions and Exemptions

As discussed in section IV.A.1 above, the sulfur standards in today's rule generally cover all the diesel fuel that is intended for use in or used in nonroad, locomotive, and marine (NRLM) applications that is not already covered by the standards for highway diesel fuel. For the purposes of this preamble, this fuel is defined primarily by the type of engine which it is used to power: Land-based nonroad, locomotive, and marine diesel engines. Section IV.A.1 above also describes several types of petroleum distillate that are not covered by the sulfur standards promulgated today, including jet fuel and heating oil, provided they are not used in NRLM engines. The following paragraphs discuss several provisions and exemptions for NRLM diesel fuel that will apply in special circumstances.

1. Fuel Used in Military Applications

NRLM diesel fuel used in military applications is treated in the same manner as under the recent highway diesel rule. Refiners are not required to produce these fuels to the NRLM standards. However, at the same time, their use is limited only to certain military applications. NRLM diesel fuel is defined so that JP-5, JP-8, F76, and any other military fuel that is used or intended for use in NRLM diesel engines or equipment is initially subject to all of the requirements applicable to NRLM diesel fuel. However, today's rule also exempts these military fuels from the diesel fuel sulfur content and other requirements in certain circumstances. First, these fuels are exempt if they are used in tactical military motor vehicles or nonroad engines, or equipment that have a national security exemption from the vehicle or engine emissions standards. Due to national security considerations, EPA's existing regulations allow the military to request and receive national security exemptions (NSE) for their motor vehicles and NRLM diesel engines and equipment from emissions regulations if the operational requirements for such vehicles, engines, or equipment warrant such an exemption. This final rule does not change these provisions. Fuel used in these applications is exempt. Second, these fuels are also exempt if they are used in tactical military vehicles, engines, or equipment that are not covered by a national security exemption but, for national security reasons (such as the need to be ready for immediate deployment overseas), these vehicles, engines, and equipment need to be fueled on the same fuel as

vehicles, engines, or equipment with a national security exemption. Use of JP-5, JP-8, F76, or any other fuel not meeting NRLM diesel fuel standards in a motor vehicle or NRLM diesel engine or equipment other than the those described above is prohibited under today's rule.

EPA and the Department of Defense have developed a process to address the tactical vehicles, engines, and equipment covered by the diesel fuel exemption and are discussing whether changes to it might be appropriate. Based on data provided by the Department of Defense to date in the context of implementing a similar exemption provision in the highway program, EPA believes that providing an exemption for military fuel used in tactical nonroad engines and equipment will not have any significant environmental impact.

The Department of Defense (DoD) commented that EPA should reconsider its determination that the definition of diesel fuel includes JP8 and JP5. DoD cited a 1995 letter from EPA which stated that there was insufficient reason to conclude that JP-8 is commonly and commercially known as diesel fuel under the then applicable definition of motor vehicle diesel fuel. Since the time of this letter, EPA has become aware of a substantial number of cases of the misuse of aviation turbine fuel in highway engines. The potential for misuse of JP-8 or similar fuels in NRLM equipment where no national security exemption exists would remain. To ensure that NRLM equipment is properly fueled with low sulfur fuel, the definition of NRLM diesel fuel has been written to encompass all diesel or other distillate fuels used or intended for use in NRLM engines, which would include JP-8 and JP-5. Furthermore, the provisions in today's rule allow vehicles, engines, and equipment to be fueled with military specification fuels that are exempt from the sulfur standards when needed for national security. We believe that this provides DoD with the needed flexibility to meet its goals of keeping vehicles, engines, and equipment ready for quick deployment overseas.

2. Fuel Used in Research, Development, and Testing

Today's final rule permits parties to request an exemption from the sulfur or other standards for NRLM diesel fuel used for research, development and testing purposes ("R & D exemption"). We recognize that there may be legitimate research programs that require the use of diesel fuel with higher sulfur levels than allowed under today's

rule. As a result, this final rule contains provisions for obtaining an exemption from the prohibitions for persons, producing, distributing, transporting, storing, selling, or dispensing NRLM diesel fuel that exceeds the standards, where such diesel fuel is necessary to conduct a research, development, or testing program.

Parties seeking an R & D exemption must submit an application for exemption to EPA that describes the purpose and scope of the program, and the reasons why higher-sulfur diesel fuel is necessary. Upon presentation of the required information, an exemption can be granted at the discretion of the Administrator, with the condition that EPA can withdraw the exemption in the event the Agency determines the exemption is not justified. In addition, an exemption based on false or inaccurate information will be considered void *ab initio*. Fuel subject to an exemption is exempt from certain provisions of this rule, including the sulfur standards, provided certain requirements are met. These requirements include the segregation of the exempt fuel from non-exempt NRLM and highway diesel fuel, identification of the exempt fuel on PTDs, pump labeling, and where appropriate, the replacement, repair, or removal from service of emission systems damaged by the use of the high sulfur fuel.

3. Fuel Used in Racing Equipment

There are no provisions for an exemption from the sulfur or other content standard and other requirements for diesel fuel used in racing in today's final rule. Under certain conditions, racing vehicles are not considered nonroad vehicles. See, for example, 40 CFR § 89.2, definition of "nonroad vehicle." The fuel used by such racing vehicles would not necessarily be considered nonroad diesel fuel. However, we believe that there is a realistic chance that such fuel also could be used in NRLM equipment, and therefore, should be considered NRLM diesel fuel. We received no comments supporting the need for an exemption for racing fuel. We are not aware of any advantage for racing vehicles or racing equipment to use fuel having higher sulfur levels than are required by this rule, and we are concerned about the potential for misfueling of nonroad equipment and motor vehicles that could result from having a high sulfur (e.g., 3,000 ppm) fuel for vehicle or nonroad equipment available in the marketplace. Consequently, as was the case with the highway diesel rule, this final rule does not provide an exemption from the

nonroad diesel fuel requirements for fuel used in racing vehicles or equipment.

4. Fuel for Export

Fuel produced for export, and that is actually exported for use in a foreign country, is exempt from the fuel content standards and other requirements of this final rule. Such fuel will be considered as intended for use in the U.S. and subject to the standards in today's rule unless it is designated by the refiner as for export only and PTDs state that the fuel is for export only. Fuel intended for export must be segregated from all fuel intended for use in the U.S., and distributing or dispensing such fuel for domestic use is illegal.

B. Additional Requirements for Refiners and Importers

The primary requirements for refiners and importers under today's final rule are discussed in section IV above. In that section, we discuss the general structure of the compliance and enforcement provisions applicable to refiners and importers, including fuel content standards, fuel volume designation and tracking provisions, and credit provisions. In this subsection, we discuss several additional requirements for refiners and importers that are not addressed in section IV. In addition, sections V.G, V.H, and V.I below discuss several provisions that apply to all parties in the diesel fuel production and distribution system, including refiners and importers.

1. Transfer of Credits

This final rule includes provisions for NRLM diesel sulfur credit transfers that are essentially identical to other fuels rules that have credits provisions. As in other fuels rules, NRLM diesel sulfur credits can only be transferred between the refiner or importer generating the credits and the refiner or importer using the credits. If a credit purchaser can not use all the credits it purchased from the refiner who generated them, the credits can be transferred one additional time. We recognize that there is potential for credits to be generated by one party and subsequently purchased and used in good faith by another party, where the credits are later found to have been calculated or created improperly, or otherwise found to be invalid. As with the reformulated gasoline rule, the Tier 2/Gasoline Sulfur rule, and the highway diesel sulfur rule, invalid credits purchased in good faith are not valid for use by the purchaser. To allow such use would not be consistent with the environmental goals of the regulation. In

addition, both the seller and purchaser of invalid credits must adjust their credit calculations to reflect the proper credits and either party (or both) can be deemed in violation if the adjusted calculations demonstrated noncompliance. We expect that the parties to such a credit transaction will develop contractual provisions to address these circumstances.

Nevertheless, in a situation where invalid credits are transferred, our strong preference will be to hold the credit seller liable for the violation, rather than the credit purchaser. As a general matter we expect to enforce a shortfall in credit compliance calculations against the credit seller, and we expect to enforce a compliance shortfall (caused by the good faith purchase of invalid credits) against a good faith purchaser only in cases where we are unable to recover sufficient valid credits from the seller to cover the shortfall. Moreover, in settlement of such cases we will strongly encourage the seller to purchase credits to cover the good faith purchaser's credit shortfall. EPA will consider the covering of a credit deficit through the purchase of valid credits a very important factor in mitigation of any case against a good faith purchaser, whether the purchase of valid credits is made by the seller or by the purchaser.

2. Additional Provisions for Importers and Foreign Refiners Subject to the Credit Provisions or Hardship Provisions

Since this final rule includes several compliance options that can be used by NRLM diesel fuel importers and foreign refiners, we are also finalizing specific compliance and enforcement provisions to ensure compliance for imported NRLM diesel fuel. These additional foreign refiner provisions are similar to those under the gasoline anti-dumping regulations, the gasoline sulfur regulations and the highway diesel fuel regulations (see 40 CFR 80.94, 80.410, and 80.620).

Under today's final rule, the per gallon standards for NRLM diesel fuel produced by refineries owned by foreign refiners must be met by the importer, unless the foreign refiner has been approved to produce NRLM diesel fuel under the credit provisions, small refiner provisions or hardship provisions of this final rule. If the foreign refiner is approved under any of these provisions, the volume and other requirements must be met by the foreign refiner for its refinery(s) and the foreign refiner must be the entity(s) generating, using, banking or trading any credits for the NRLM diesel fuel produced for and

imported into the U.S. Importers themselves are not eligible for small refiner or hardship relief as they do not face the same capital cost and lead-time issues faced by refiners. Importers may participate in the credit programs, however, an importer and a foreign refiner may not generate credits for the same fuel.

Any foreign refiner that produces NRLM diesel fuel subject to the credit provisions, small refiner provisions or the hardship provisions will be subject to the same requirements as domestic refiners operating under the same provisions. Additionally, provisions for foreign refiners exist that are similar to the provisions at 40 CFR 80.94, 80.410, and 80.620, which include:

- Segregation of NRLM diesel fuel produced at the foreign refinery until it reaches the U.S. and separate tracking of volumes imported into each PADD;
- Controls on product designation;
- Load port and port of entry testing; and
- Requirements regarding bonds and sovereign immunity.

These provisions will aid the Agency in tracking NRLM diesel fuel from the foreign refinery to its point of import into this country. We believe these provisions are necessary and sufficient to ensure that foreign refiners' compliance can be monitored and that the diesel fuel requirements in today's rule can be enforced against foreign refiners.

3. Diesel Fuel Treated as Blendstock (DTAB)

Under today's program, a situation could arise for importers where fuel that was expected to comply with the 15 ppm sulfur NRLM standard is found to be slightly higher in sulfur than the standard. Rather than require that importer to account for, and report, that fuel as 500 ppm sulfur fuel, an importer will be able to designate the non-complying fuel as blendstock—"diesel fuel treated as blendstock" or DTAB—rather than as NRLM diesel fuel. In its capacity as a refiner, the party can then blend this DTAB fuel with lower sulfur diesel fuel or with other blendstocks to cause the sulfur level of the combined product to meet the 15 ppm sulfur NRLM diesel fuel standard prior to delivery to another entity. The same situation exists with respect to compliance with the 15 ppm sulfur highway standard. However, no provision was made in the 2007 highway final rule for this. Consequently, we are also finalizing these DTAB provisions in this final rule

for application to 15 ppm sulfur highway diesel fuel.

Where diesel fuel that has been previously designated by a refiner is used to reduce the sulfur level of the DTAB to 15 ppm or less, the party, in its refiner capacity, is required to report only the volume of the imported DTAB as the amount of diesel fuel produced.¹⁴⁷ This avoids the double counting that would result if the same diesel fuel is reported twice (*i.e.*, once by the refiner who originally produced it and again by the refiner using it to blend with DTAB). If the product that is blended with the DTAB is not previously designated diesel fuel, but is also blendstock, the total combined volume of the DTAB and other blendstock constitutes the batch produced.

When an importer classifies diesel fuel as DTAB, that DTAB does not count toward the importer's calculations under the highway diesel rule's temporary compliance option, toward credit generation or use, or for volume account balance compliance calculations (*see* section IV).¹⁴⁸ The same party, however, must include the DTAB in such calculations in its capacity as a refiner. We believe such an approach will increase the supply of 15 ppm sulfur fuel by reducing the volume of near-compliant fuel that is downgraded to higher sulfur designations. In essence, it allows importers the same flexibility that refiners have within their refinery gate.

Similar to the provisions discussed above regarding the manufacture of 15 ppm sulfur diesel fuel using DTAB, 500 ppm sulfur NRLM and highway diesel fuel can also be manufactured using DTAB provided that this is appropriately reflected in the importer's compliance calculations.

C. Requirements for Parties Downstream of the Refinery or Import Facility

In order for the environmental benefits of the NRLM diesel program to be realized, parties in the fuel distribution system downstream of the refinery (including pipelines, terminals, bulk plants, wholesale purchaser-consumers, and retailers¹⁴⁹) must

¹⁴⁷ Volumes of previously designated diesel fuel would be reported as volumes received under the designate and track provisions of Section IV.D.

¹⁴⁸ Importer/refiners availing themselves of the DTAB provisions are still subject to the downgrading provisions, and other provisions applicable to any importer or refiner.

¹⁴⁹ An owner/operator of a tanker truck that delivers fuel directly from the tanker truck tank into motor vehicles or nonroad equipment of another business entity (*i.e.* a mobile refueler) would be acting as a retailer, and the truck would be operating as a retail outlet. In other words, the term

ensure that the sulfur level of fuels supplied to the various end-users covered by today's rule complies with the requirements in today's rule. At certain points in the distribution system, such parties must keep the various grades of fuel having different sulfur specifications physically separate,¹⁵⁰ and ensure that the fuel is properly designated and labeled. In other words, fuel represented as 15 ppm sulfur must comply with the 15 ppm sulfur standard, and fuel represented as 500 ppm sulfur must meet the 500 ppm sulfur standard. At other points in the distribution system, certain fuels may be commingled provided that the fuel volumes are appropriately designated and accounted for in the custody holders volume account balance. Owners and operators of NRLM diesel equipment must also use fuels meeting specific sulfur content standards. The following paragraphs discuss several provisions that apply to these parties: Distribution of various fuel sulfur grades; diesel fuel pump labeling; use of used motor oil in diesel fuel; use of kerosene in diesel fuel; use of additives in diesel fuel; requirements for end users; and provisions covering downgrading of undyed diesel fuel to different grades of fuel. These provisions are analogous to similar provisions that apply to highway diesel fuel under the highway program. Section IV discusses in detail the provisions applicable to downstream parties under the designate and track program.

1. Product Segregation and End Use Requirements

The main requirements for compliance with the fuel sulfur standards under today's rule, including the designate and track provisions, are discussed in section IV of today's preamble. The sulfur content of all fuels subject to the sulfur requirements in today's rule must be appropriately

retail outlet is not limited to stationary facilities. EPA proposed specific textual changes to the definition of retail outlet to clarify this, but has decided there is no need to change the definition, as it has always had this plain meaning. The owner/operator of such a tanker truck may also be subject to distributor requirements and prohibitions, or carrier responsibilities if the trucker company does not take title to the fuel. As the definitions in 40 CFR 80.2 make clear, it is the functions performed by the owner/operator that determine whether they come within the scope of the applicable definitions, and the resulting obligations or requirements that apply. Mobile refuelers are not subject to the labeling requirements applicable to other retailers but are required to provide PTDs to their customers.

¹⁵⁰ For example: Once the required marker is added to heating oil at the terminal, heating oil must be segregated from all other fuel grades. Once red dye is added to NRLM it must be segregated from highway diesel fuel.

represented (designated/classified/ labeled) at all times through to the retailer or wholesale purchaser consumer. Furthermore, the designation and classification information on the label and PTD, and the actual sulfur content of any subject fuel must be consistent with the requirements detailed in section IV. Section IV also details how to accurately redesignate, reclassify, and re-label fuel volumes. This subsection discusses the various grades and uses of NRLM fuel under the NRLM diesel program. In later subsections, we discuss related requirements for PTDs to identify fuels throughout the distribution system and provisions relating to the liability that all parties in the distribution face for failing to maintain the standards of these different fuel sulfur grades.

a. The Period From June 1, 2007 Through May 31, 2010

From June 1, 2007 through May 31, 2010, all fuel used in NRLM equipment must meet a 500 ppm sulfur standard except for fuel produced or imported under the hardship, small refiner, and credit provisions.¹⁵¹ Outside of the Northeast/Mid-Atlantic Area and Alaska, we will not be able to rely upon the measurement of sulfur content alone to enforce the segregation requirements for heating oil, and are therefore requiring that heating oil be marked before it leaves the terminal by the addition of 6 mg/L of SY-124. Fuel containing more than 0.1 mg/L of the marker will be deemed to be heating oil and may not be used as nonroad, locomotive or marine fuel.

NRLM fuel designated or labeled as 500 ppm sulfur must meet the 500 ppm sulfur standard and any fuel designated or labeled as 15 ppm must meet the 15 ppm sulfur standard.¹⁵² If a fuel meeting these standards is mixed or contaminated with a higher sulfur fuel it must be downgraded to the higher sulfur product and new documentation (e.g., PTD, label) must be created to reflect the downgrade. During this period there will also be nonroad equipment that is expected to be equipped with sulfur sensitive emissions control technology that needs to operate on 500 ppm sulfur or less fuel in order to meet the NRLM program's emission standards in-use. Fuels sold for use in, or dispensed into, these engines must be identified as meeting

the 15 ppm sulfur standard or the 500 ppm sulfur standard, as applicable, and if so identified must meet such standard. Distributors and retailers must avoid contaminating fuel represented by them on PTDs or pump labels as 15 ppm sulfur fuel or 500 ppm sulfur fuel with higher sulfur fuels. End users are required to use only the fuel grades identified as appropriate for use on the label affixed to their NRLM equipment.

b. The Period From June 1, 2010 Through May 31, 2012

Beginning June 1, 2010, all fuel used in nonroad equipment must meet a 15 ppm sulfur standard except for 500 ppm sulfur fuel produced or imported under the hardship, small refiner, and credit provisions, or downstream flexibility provisions which may continue to be used in nonroad engines produced prior to 2011. Locomotive and marine fuel will continue to be subject to the sulfur requirements applicable beginning June 1, 2007, until May 31, 2012.

During this time period, we will not be able to rely upon the measurement of sulfur content alone to enforce the segregation requirements for LM fuel and NR 500 ppm sulfur fuel outside of the Northeast/Mid-Atlantic Area and Alaska, and are therefore requiring that LM fuel produced or imported for use outside of the Northeast/Mid-Atlantic Area and Alaska be marked before it leaves the terminal by the addition of 6 mg/L of SY-124. Fuel containing more than 0.1 mg/L of the marker will be deemed to be either LM fuel or heating oil and may not be used as nonroad fuel. Fuel containing the marker that meets a 500 ppm sulfur standard will be deemed to be LM fuel, whereas fuel containing the marker with a sulfur content above 500 ppm will be deemed to be heating oil.

As discussed in section IV above, small refiners will be able to continue to produce 500 ppm sulfur nonroad fuel, through May 31, 2014. Other refiners may use credits through May 31, 2014 to continue to produce fuel to the 500 ppm sulfur nonroad diesel fuel standard. Nonroad diesel fuel meeting a 500 ppm sulfur standard may also be produced due to interface mixing in the distribution system.¹⁵³ In any case, 15 ppm sulfur diesel fuel must be segregated from 500 ppm sulfur NRLM diesel fuel throughout the distribution system including the end user, such that

it maintains its designation, or it must be redesignated and labeled to its downgraded specification.¹⁵⁴

Because of the sulfur sensitivity of the expected engine emission control systems beginning in model year 2011 for nonroad diesel engines, it is imperative that the distribution system segregate nonroad diesel fuel subject to the 15 ppm sulfur standard from higher sulfur distillate products, such as 500 ppm sulfur LM fuel, 500 ppm sulfur nonroad diesel fuel produced by small refiners or through the use of credits, heating oil, and jet fuel. End users are required to use only the fuel grades identified as appropriate for use on the label affixed to their NR and LM equipment.

We are also concerned about potential misfueling of engines requiring 15 ppm sulfur fuel at retail or wholesale purchaser-consumer facilities (as defined under this program), or other end-user facilities, even when segregation of 15 ppm sulfur fuel from the higher-sulfur grades of diesel fuel has been maintained in the distribution system. Thus, downstream compliance and enforcement provisions of this rule are aimed at both preventing contamination of nonroad diesel fuel subject to the 15 ppm sulfur standard (i.e., fuel represented to meet that standard) and preventing misfueling of new nonroad equipment.

c. The Period From June 1, 2012 Through May 31, 2014

Beginning June 1, 2012, all fuel used in locomotive and marine equipment must meet a 15 ppm sulfur standard except for 500 ppm sulfur fuel produced or imported under the hardship, small refiner, and credit provisions, or downstream flexibility provisions. As discussed in section IV above, small refiners will be able to continue to produce 500 ppm sulfur LM fuel, through May 31, 2014. Other refiners may use credits through May 31, 2014 to continue to produce fuel to the 500 ppm sulfur LM diesel fuel standard. Locomotive, and marine diesel fuel meeting a 500 ppm sulfur standard may also be produced due to interface mixing in the distribution system indefinitely.

The marker requirement for 500 ppm sulfur LM diesel fuel expires on June 1, 2012. After June 1, 2012, only heating oil must continue to be marked and any LM diesel fuel distributed from the terminal must not contain the marker. To allow marked LM diesel fuel

¹⁵¹ Fuel produced in the distribution system that meets a 500 ppm sulfur specification may be used in NRLM equipment through June 1, 2014, and in locomotive and marine equipment thereafter.

¹⁵² This requirement becomes effective June 1, 2006 to support the anti-downgrade requirements in the highway diesel rule.

¹⁵³ Such 500 ppm sulfur downstream flexibility nonroad diesel fuel may be also be used in LM equipment since it complies with the LM sulfur standard applicable during this time period. Thus, both marked and unmarked 500 ppm sulfur fuel may be used in LM equipment during this time period.

¹⁵⁴ These flexibilities do not exist in the Northeast/Mid-Atlantic Area, and only the small refiner option exists in Alaska.

distributed prior to June 1, 2012 to be consumed by end-users, the downstream prohibition against LM fuel containing the marker will not become effective until October 1, 2012.

Beginning October 1, 2012, LM diesel fuel at any location must contain no more than 0.1 mg/L of the marker.¹⁵⁵ We believe that allowing four months for downstream parties to blend down their stocks of marked LM diesel fuel with receipts of unmarked LM diesel fuel will be sufficient for such parties to comply with the prohibition against possessing LM fuel with a marker concentration greater than 0.1 mg/L.

The requirements that became effective for fuel used in nonroad equipment on June 1, 2010, will remain effective until May 31, 2014.

d. After May 31, 2014

After the small refiner, credit, and off-specification fuel flexibilities have expired, the remaining sulfur grades of diesel fuel will be 15 ppm sulfur highway and NRLM fuel, 500 ppm sulfur LM diesel fuel (produced due to interface mixing in the distribution system outside of the Northeast/Mid-Atlantic Area and Alaska), and heating oil, some of which may meet a 500 ppm sulfur standard. Product transfer documents are required to accompany the batches of such fuels which must contain the specified identifying information. Highway and NRLM diesel fuel meeting a 15 ppm sulfur specification must be segregated from 500 ppm sulfur LM diesel fuel, and heating oil. Today's rule contains provisions for the fungible shipment of LM diesel fuel with any heating oil meeting a 500 ppm sulfur cap up to the point where the fuel leaves the terminal that are similar to the provisions that allow the fungible shipment of high sulfur NRLM diesel fuel and high sulfur heating oil discussed in the previous section. Under such circumstances the designate and track and heating oil account balance requirements must be satisfied.

2. Diesel Fuel Pump Labeling To Discourage Misfueling

For any multiple-fuel program like the two-step program we are finalizing today, we believe that the clear labeling of nonroad diesel fuel pumps is vital so that end users can readily distinguish between the several grades of fuel that may be available at fueling facilities,

¹⁵⁵ Allowing four months for the LM fuel distribution system to sufficiently purge itself of marked fuel is consistent with the time allowed for LM diesel fuel to comply with a 500 ppm sulfur standard after the refinery gate 15 ppm sulfur standard for LM fuel becomes effective.

and properly fuel their nonroad equipment. Section III.N above describes the labels that manufacturers are required to place on nonroad equipment, and the information that must be provided to nonroad equipment owners. Section VI discusses the likely benefit for many nonroad engines to utilize 500 ppm sulfur diesel fuel as soon as it becomes available in 2007. Today's final rule includes requirements for labeling fuel pump stands used to fuel NRLM equipment and highway diesel vehicles.

To help prevent misfueling of nonroad, locomotive and marine engines, and to thus ensure that the environmental benefits of the program are realized, we are finalizing pump labeling requirements similar to those adopted in the highway diesel rule (40 CFR 80.570). Today's pump dispenser labeling requirements are discussed separately according to the date they become effective: June 1, 2006, June 1, 2007, June 1, 2010, and June 1, 2014.

Today's final rule also amends the pump dispenser labeling language in the highway diesel regulations for consistency with the NRLM program. Because existing highway diesel regulations prohibit highway diesel fuel with sulfur levels above 500 ppm, the highway diesel final rule and this program have different meanings for the terms "low sulfur" and "high sulfur," and the highway diesel final rule does not use the term "ultra low-sulfur." Further, because the highway diesel final rule did not need to categorize the different uses of non-highway diesel fuel, the highway diesel final rule and this program have different meanings for the term "nonroad."¹⁵⁶ The amendments to the highway pump dispenser labeling language finalized by today's rule are meant to avoid confusion at the fuel pumps caused by labels that would have different meanings depending on whether the pump is dispensing highway or non-highway diesel fuel. Today's final rule adds effective dates to each paragraph of the labeling provisions of the highway diesel rule for consistency with the additional pump labeling sections of this program, and to distinguish the

¹⁵⁶ In the highway diesel rule, the term "high-sulfur" means diesel fuel with a sulfur level greater than 15 ppm, whereas in this rule it means diesel fuel with a sulfur level greater than 500 ppm. In the highway diesel rule, the term "low-sulfur" means diesel fuel with a sulfur level less than or equal to 15 ppm, whereas in this rule it means diesel fuel with a sulfur level less than or equal to 500 ppm. In addition, the term "nonroad" as used in the highway diesel rule means "non-highway" (*i.e.*, all fuel that is not highway fuel), but the term "nonroad" as used in this rule does not include locomotive diesel, marine diesel and heating oil.

non-highway labeling requirement effective June 1, 2006 under the highway diesel rule from the non-highway labeling requirements of this rule that are effective in 2007.

Alternate labels to those specified in today's rule may be used if they are approved by the Administrator.

Today's rule also finalizes labeling requirements for pumps in Alaska that dispense NRLM diesel fuel and heating oil which is exempt from the red dye and fuel marker requirements which differ from the labeling requirements discussed in this section. Please refer to § 69.52(e) of the regulatory text to today's rule for these pump labeling requirements applicable in Alaska.

a. Pump Labeling Requirements that Become Effective June 1, 2006

The pump labeling requirements described in this section become effective June 1, 2006.

i. Pumps Dispensing Highway Diesel Fuel Subject to the 15 ppm Sulfur Standard

The label on pumps dispensing highway diesel fuel subject to the 15 ppm sulfur standard must read as follows:

ULTRA LOW-SULFUR HIGHWAY DIESEL FUEL (15 ppm Sulfur Maximum)

Required for use in all model year 2007 and later highway diesel vehicles and engines.

Recommended for use in all diesel vehicles and engines.

The above labeling requirement for 15 ppm sulfur highway diesel fuel continues through May 31, 2010, after which time different pump label requirements for this fuel become effective as described in section V.C.2.c.3. of this preamble.

ii. Pumps Dispensing Highway Diesel Fuel Subject to the 500 ppm Sulfur Standard

The label on pumps dispensing highway diesel fuel subject to the 500 ppm sulfur standard must read as follows:

LOW-SULFUR HIGHWAY DIESEL FUEL (500 ppm Sulfur Maximum)

WARNING

Federal law *prohibits* use in model year 2007 and later highway vehicles and engines. Its use may damage these vehicles and engines.

Dispensing highway diesel fuel that has a sulfur content above 15 ppm is prohibited into any highway vehicle after September 30, 2010. Hence no pumps may display the above label after September 30, 2010.

iii. Pumps Dispensing Diesel Fuel for Non-Highway Equipment That Does Not Meet the Standards for Motor Vehicle Diesel Fuel

The label on pumps dispensing diesel fuel for non-highway equipment that does not meet the standards for motor vehicle diesel fuel must read as follows:

NON-HIGHWAY DIESEL FUEL (May Exceed 500 ppm Sulfur)

WARNING

Federal law prohibits use in any highway vehicle or engine

Its use may damage these vehicles and engines.

This labeling requirement is effective until May 31, 2007, after which high sulfur non-highway diesel fuel must be labeled according to the provisions described in section V.C.2.b.iii and 500 ppm sulfur non-highway diesel fuel must be labeled according to the provisions described in section V.C.2.b.1. of today's preamble.

b. Pump Labeling Requirements That Become Effective June 1, 2007

As discussed in section IV, between June 1, 2007 and September 30, 2010, end users are not always required to dispense fuel meeting the 500 ppm sulfur standard into nonroad, equipment, locomotives or marine vessels. During this time period, small refiner fuel and fuel produced under the credit provisions with sulfur levels exceeding 500 ppm will continue to exist in the distribution system. During this time period, there will also be nonroad equipment with engines certified as meeting the Tier 4 emission standards (*i.e.*, engines equipped with emission controls that allow them to meet the Tier 4 standards earlier than required). Some of this equipment is expected to be equipped with sulfur sensitive technology that will need to operate on fuel with a sulfur content of 500 ppm or less to function properly. For this reason, it is important that NRLM end users be able to know the sulfur level of the fuel they are purchasing and dispensing. Therefore, fuel pump dispensers for the various sulfur grades must also be properly labeled. The following pump labeling requirements become effective from June 1, 2007:

i. Pumps Dispensing NRLM Diesel Fuel Subject to the 500 ppm Sulfur Standard

The label on pumps dispensing 500 ppm (maximum) sulfur content diesel fuel for use in NRLM engines must read as follows:

LOW-SULFUR NON-HIGHWAY DIESEL FUEL (500 ppm Sulfur Maximum)

WARNING

Federal law prohibits use in any highway vehicle or engine

The above labeling requirement remains effective until May 31, 2010, after which it is superceded by the requirements described below.

ii. Pumps Dispensing NRLM Diesel Fuel Subject to the 15 ppm Sulfur Standard

It is also likely that prior to June 1, 2010 some 15 ppm sulfur (maximum) diesel fuel will be introduced into the nonroad market early. Both the engine and fuel credit provisions envision such early introduction of 2011-compliant engines and 15 ppm sulfur diesel fuel. Thus, it is important that nonroad end users be able to know when they are purchasing diesel fuel with 15 ppm or less sulfur.¹⁵⁷ The label on pumps dispensing 15 ppm sulfur diesel fuel for use in NRLM engines must read as follows:

ULTRA-LOW SULFUR NON-HIGHWAY DIESEL FUEL (15 ppm Sulfur Maximum)

Required for use in all model year 2011 and newer nonroad diesel engines.

Recommended for use in all nonroad, locomotive and marine diesel engines.

WARNING

Federal law prohibits use in any highway vehicle or engine.

The above labeling requirement continues until May 31, 2014, after which it is superceded by the labeling provisions described in section V.C.2.e.i of today's preamble.

iii. Pumps Dispensing Diesel Fuel With a Sulfur Content Greater Than 500 ppm for Use in Older NRLM Equipment

The label on pumps dispensing diesel fuel having a sulfur content greater than 500 ppm (for use in older nonroad, locomotive, and marine diesel engines) must read as follows:

HIGH-SULFUR NON-HIGHWAY DIESEL FUEL (May Exceed 500 ppm Sulfur)

WARNING

Federal law prohibits use in highway vehicles or engines

May damage nonroad, diesel engines required to use low-sulfur or ultra-low sulfur diesel fuel.

The above labeling requirement remains effective until September 30, 2010. After September 30, 2010 no pump may display this label.

¹⁵⁷ The IRS requires that 15 ppm sulfur non-highway diesel fuel must contain red dye after it leaves the terminal.

iv. Pumps Dispensing Heating Oil

As discussed in section IV.B.2.b, it is necessary to segregate heating oil from NRLM diesel fuel to ensure that the fuel used in nonroad, locomotive, and marine equipment is compliant with the sulfur standards in today's rule. The label on pumps dispensing non-highway diesel fuel for use other than in nonroad, locomotive or marine engines, such as for use in stationary diesel engines or as heating oil, must read as follows:

HEATING OIL (May Exceed 500 ppm Sulfur)

WARNING

Federal law prohibits use in highway vehicles or engines, or in nonroad, locomotive, or marine engines.

Its use may damage these diesel engines.

The above labeling will remain effective indefinitely.

c. Pump Labeling Requirements That Become Effective June 1, 2010

Beginning October 1, 2010, all diesel fuel introduced into highway diesel vehicles, regardless of the year of manufacture, must meet the 15 ppm sulfur standard. Furthermore, with certain exceptions, fuel introduced into any nonroad engine must meet the 15 ppm sulfur standard. The exceptions are fuel allowed to meet the 500 ppm sulfur standard for use only in pre-model year 2011 nonroad engines and locomotive and marine engines, for example, small refiner nonroad diesel fuel and credit nonroad diesel fuel, as well as downgraded 15 ppm sulfur diesel fuel from the distribution system. This use of 500 ppm sulfur diesel fuel in nonroad engines will continue through September 30, 2014,¹⁵⁸ after which all nonroad diesel fuel must meet the 15 ppm sulfur standard. The following pump labeling requirements become effective June 1, 2010:

i. Pumps Dispensing NRLM Diesel Fuel Subject to the 500 ppm Sulfur Standard

The label on pumps dispensing 500 ppm (maximum) nonroad, locomotive, and marine diesel fuel, as discussed in section IV.B.3.b, must read as follows:

LOW-SULFUR NON-HIGHWAY DIESEL FUEL (500 ppm Sulfur Maximum)

WARNING

Federal law prohibits use in all model year 2011 and newer nonroad engines.

May damage model year 2011 and newer nonroad engines.

¹⁵⁸ Production of 500 ppm sulfur fuel under the credit provisions is allowed until June 1, 2012, but small refiner fuel subject to the 500 ppm sulfur standard can continue to be produced until June 1, 2014 and will be available to end users until September 1, 2014.

Federal Law *Prohibits* Use in any Highway Vehicle or Engine.

Recommended for use in all locomotive and marine equipment.

The above labeling requirement remains effective until September 30, 2014. After September 30, 2014, no pump may display this label.

ii. Pumps Dispensing Marked LM Fuel

The label on pumps dispensing 500 ppm sulfur locomotive, and marine diesel fuel, as discussed in section IV.B.3.b., must read as follows:

LOW-SULFUR LOCOMOTIVE AND MARINE DIESEL FUEL (500 ppm Sulfur Maximum)

WARNING

Federal law *prohibits* use in nonroad engines or in highway vehicles or engines.

The above labeling requirement remains effective until September 30, 2012. After September 30, 2012, no pump may display this label.

iii. Pumps Dispensing Highway Diesel Fuel Subject to the 15 ppm Sulfur Standard

The label on pumps dispensing highway diesel fuel subject to the 15 ppm sulfur standard of § 80.520(a)(1) must read as follows:

ULTRA LOW-SULFUR HIGHWAY DIESEL FUEL (15 ppm Sulfur Maximum)

Required for use in all highway diesel vehicles and engines.

Recommended for use in all diesel vehicles and engines.

The above labeling requirement for 15 ppm sulfur highway diesel fuel continues indefinitely.

d. Pump Labeling Requirements That Become Effective June 1, 2014

Beginning October 1, 2014, all nonroad fuel distributed to end-users is required to meet the 15 ppm sulfur standard, without exception.

Locomotive and marine fuel downstream of the refinery or importer is still subject to the 500 ppm sulfur standard. The pump labels for heating oil will continue to be the same as for the period 2010 through 2014. The following pump labeling requirements become effective beginning June 1, 2014:

i. Pumps Dispensing NRLM Diesel Fuel Subject to the 15 ppm Sulfur Standard

For pumps dispensing nonroad diesel fuel the label must read as follows:

ULTRA-LOW SULFUR NON-HIGHWAY DIESEL FUEL (15 ppm Sulfur Maximum)

Required for use in all nonroad diesel engines.

Recommended for use in all locomotive and marine diesel engines.

WARNING

Federal law *prohibits* use in any highway vehicle or engine.

The above labeling requirement continues indefinitely.

ii. Pumps Dispensing Locomotive and Marine Diesel Fuel Subject to the 500 ppm Sulfur Standard

For pumps dispensing locomotive or marine diesel fuel, the label must read as follows:

LOW-SULFUR LOCOMOTIVE OR MARINE DIESEL FUEL (500 ppm Sulfur Maximum)

WARNING

Federal law *prohibits* use in nonroad engines or in highway vehicles or engines. Its use may damage these engines.

The above labeling requirement will remain effective indefinitely.

f. Nozzle Size Requirements or other Requirements To Prevent Misfueling

Like the highway diesel fuel program, the NRLM diesel fuel program does not include a nozzle size requirement. In part this is because we are not aware of an effective and practicable scheme to prevent misfueling through the use of different nozzle sizes or shapes, and in part because we do not believe that improper fueling will be a significant enough problem to warrant such an action. In the preamble to the highway diesel fuel rule, we stated our belief that the use of unique nozzles, color-coded scuff-guards, or dyes to distinguish the grades of diesel fuel may be useful in preventing accidental use of the wrong fuel. (See 66 FR 5119, January 18, 2001.) However, we did not finalize any such requirements, for the reasons described in the RIA for that final rule (section IV.E).

Similar reasoning applies to the NRLM diesel fuel program. For example, 15 ppm sulfur diesel fuel will be the dominant fuel in the market by 2010, likely comprising more than 80 percent of all number 2 distillate. Further, we believe that 500 ppm sulfur diesel fuel will have limited availability between 2010 and 2014. High-sulfur distillate for heating oil uses will remain, but will only exist in significant volumes in certain parts of the country. In addition, as with highway diesel engines, there is currently no standardization of fuel tank openings and filler necks that would allow for a simple, inexpensive, standardization of nozzles. In any event, we believe that most owners and operators of new nonroad diesel engines and equipment will not risk voiding the general warranty and the emissions warranty by misfueling.

Although in the highway diesel fuel rule we did not finalize any provisions beyond fuel pump labeling requirements, we recognized that some potential for misfueling could still exist. Consequently, we expressed a desire to continue to explore with industry simple, cost-effective approaches that could further minimize misfueling potential such as color-coded nozzles/scuff guards. Since the highway diesel rule was promulgated, we have had discussions with fuel retailers, wholesale purchaser-consumers, vehicle manufacturers, and nozzle manufacturers, and continue to examine different methods for preventing accidental or intentional misfueling under the highway diesel fuel sulfur program. To date, the affected stakeholders, including engine and truck manufacturers, truck operators, fuel retailers, and fuel nozzle manufacturers have not reached any common view that the concerns over misfueling warrant any additional prevention measures.

3. Prohibition Against the Use of Used Motor Oil in New Nonroad Diesel Equipment

We understand that used motor oil is sometimes blended with diesel fuel today for use as fuel in nonroad diesel equipment. Such practices include blending used motor oil directly into the equipment fuel tank, blending it into the fuel storage tanks, and blending small amounts of motor oil from the engine crank case into the fuel system as the equipment is operated.

However, motor oil normally contains high levels of sulfur. Thus, the addition of used motor oil to nonroad diesel fuel could substantially impair the sulfur-sensitive emissions control equipment expected to be used by engine manufacturers to meet the emissions standards in today's final rule. Depending on how the oil is blended, it could increase the sulfur content of the fuel by as much as 200 ppm sulfur. As a result, we believe blending used motor oil into nonroad diesel fuel could render inoperative the expected emission control technology and potentially cause driveability problems. Consequently, it would violate the tampering prohibition in the Act. See CAA sections 203(a)(3), and 213(d).

Therefore, like the highway diesel rule, today's rule prohibits any person from introducing or causing or allowing the introduction of used motor oil, or diesel fuel containing used motor oil, into the fuel delivery systems of nonroad equipment engines manufactured in model year 2011 and later. The only exception to this will be

where the engine was explicitly certified to the emission standard with used motor oil added and the oil was added in a manner consistent with the certification. Furthermore, as discussed in section IV, today's rule includes certain sunset dates when all NRLM diesel fuel in the distribution system must meet the applicable sulfur standard, and before that date any NRLM designated, classified, or labeled as 15 ppm sulfur fuel must meet that sulfur standard. Blending of used motor oil into NRLM could cause these standards to be exceeded in violation of today's rule. Any party who causes the sulfur content of nonroad diesel fuel subject to the 15 ppm sulfur standard to exceed 15 ppm by blending motor oil into nonroad diesel fuel, or by using motor oil as nonroad diesel fuel, is subject to liability for violating the sulfur standard. Similarly, parties who cause the sulfur level of nonroad diesel fuel subject to the 500 ppm sulfur nonroad diesel fuel standard to exceed that standard by blending motor oil into the fuel, are also subject to liability.

4. Use of Kerosene in Diesel Fuel

As we discussed in the highway diesel final rule, kerosene is commonly added to diesel fuel to reduce fuel viscosity in cold weather (*see* 66 FR 5120, January 18, 2001). This final rule does not limit this practice with regard to 15 ppm sulfur or 500 ppm sulfur NRLM diesel fuel. However the resulting blend will still be subject to the 15 ppm sulfur or 500 ppm sulfur standard. Kerosene that is used, intended for use, or made available for use as, or for blending with, 15 ppm sulfur or 500 ppm sulfur diesel fuel is itself required to meet the 15 ppm sulfur or 500 ppm sulfur standard.

As a general matter, any party who blends kerosene, or any blendstock, into NRLM diesel fuel, or who produces NRLM diesel fuel by mixing blendstocks, will be treated as a refiner and will be subject to the requirements and prohibitions applicable to refiners under today's rule. For example, the fuel that they manufacture must meet the sulfur standards established in this rule, and represented on the PTD. However, in deference to the longstanding and widespread practice of blending kerosene into diesel fuel at downstream locations, downstream parties who only blend kerosene into NRLM and highway diesel fuel will not be subject to the requirements applicable to other refiners, provided that they do not alter the fuel in any other way, and do not violate the volume balance requirements discussed in section IV.D. For example, they will

not need to meet the 80/20 requirements under the highway diesel program. This activity is treated the same way under the final highway diesel rule. Parties that blend kerosene into diesel fuel are subject to the downstream designate and track provisions applicable to other downstream parties.

In order to ensure the continued compliance of 15 ppm sulfur fuel with the 15 ppm sulfur standard, downstream parties choosing to blend kerosene into 15 ppm sulfur NRLM diesel fuel are required to either have a PTD for that kerosene indicating compliance with the 15 ppm sulfur standard, or to have test results for the kerosene establishing such compliance. Further, downstream parties choosing to blend kerosene into 15 ppm sulfur NRLM diesel fuel are entitled to the two ppm adjustment factor discussed in section V.D.2. for both the kerosene and the diesel fuel into which it is blended at downstream locations, provided that the kerosene had been transferred to the party with a PTD indicating compliance with that standard. Sulfur test results from downstream locations of parties who do not have such a PTD for their kerosene will not be subject to this adjustment factor, either for the kerosene itself, or for the NRLM diesel fuel into which it is blended.

Any party who causes the sulfur content of NRLM diesel fuel represented as meeting the 15 ppm sulfur standard to exceed 15 ppm sulfur by blending kerosene into NRLM diesel fuel, or by using greater than 15 ppm sulfur kerosene as NRLM diesel fuel, is subject to liability for violating the sulfur standard. Similarly, parties who cause the sulfur level of NRLM diesel fuel subject to the 500 ppm sulfur diesel fuel standard to exceed that standard by blending kerosene into the fuel, are also subject to liability.

Today's rule does not require refiners or importers of kerosene to produce or import kerosene meeting the 15 ppm sulfur standard. However, we believe that refiners will produce ultra low sulfur kerosene in the same refinery processes that they use to produce ultra low sulfur diesel fuel, and that the market will drive supply of ultra low sulfur kerosene for those areas where, and during those seasons when, the product is needed for blending with NRLM, as well as a highway, diesel fuel.

As discussed in section IV.D, kerosene blending also factors into the designate and track provisions finalized today from June 1, 2006 until June 1, 2010. During this time period it is possible, and in fact likely, that kerosene meeting the 15 ppm sulfur standard will instead be designated as

No. 1 highway diesel fuel, and will simply need to meet all of the requirements of highway diesel fuel. It is also possible, though less likely that kerosene meeting the 500 ppm sulfur standard will be designated as No. 1 highway diesel fuel. However, if it is, it would also merely need to comply with all the requirements applicable to highway diesel fuel.

5. Use of Diesel Fuel Additives

Diesel fuel additives include lubricity improvers, corrosion inhibitors, cold-operability improvers, and static dissipaters. Use of such additives is distinguished from the use of kerosene or biodiesel by the low concentrations at which they are used (defined to be one percent or less) and their relatively more complex chemistry.¹⁵⁹ The suitability of diesel fuel additives for use in diesel fuel meeting a 500 ppm sulfur specification has been well established due to the existence of 500 ppm sulfur highway diesel fuel in the marketplace since 1993. The suitability of additives for use in 15 ppm sulfur diesel fuel was first addressed by EPA in the highway diesel program, which requires highway diesel fuel to meet a 15 ppm sulfur standard beginning in 2006. At the time of the finalization of the highway diesel final rule and during our development of the proposed NRLM diesel rule, our review of data submitted by additive and fuel manufacturers to comply with EPA's Fuel and Fuel Additive Registration requirements indicated that additives to meet every purpose, including static dissipation, are currently in common use which meet a 15 ppm cap on sulfur content.¹⁶⁰

a. Additives Used in 15 ppm Sulfur Diesel Fuel

Similar to the highway diesel rule, today's rule allows the bulk addition of diesel fuel additives with a sulfur content greater than 15 ppm in NRLM diesel fuel under certain circumstances.¹⁶¹ However, NRLM

¹⁵⁹ Diesel fuel additives are used at concentrations commonly expressed in parts per million. Diesel fuel additives can include specially-formulated polymers and other complex chemical components. Kerosene is used at much higher concentrations, expressed in volume percent. Unlike diesel fuel additives, kerosene is a narrow distillation fraction of the range of hydrocarbons normally contained in diesel fuel.

¹⁶⁰ See Chapter IV.D. of the RIA for the highway diesel fuel rule for more information on diesel fuel additives, EPA Air docket A-99-06, docket item V-B-01. Also see 40 CFR part 79.

¹⁶¹ Most diesel fuel additives are added at the terminal to bulk fuel volumes before sale to the consumer. These additives are referred to as bulk additives. End users and wholesale purchaser consumers sometimes also add additives to diesel

diesel fuel containing such additives will continue to be subject to the 15 ppm sulfur cap. We believe that it is most appropriate for the market to determine how best to accommodate increases in fuel sulfur content from the refinery gate to the end user, while maintaining the 15 ppm sulfur cap, and whether such increases result from contamination in the distribution system or bulk diesel additive use. By providing this flexibility, we anticipate that market forces will encourage an optimal balance between the competing demands of manufacturing fuel lower than the 15 ppm sulfur cap, limiting contamination in the distribution system, and limiting the bulk additive contribution to fuel sulfur content.

Thus, as in the highway diesel program, additive manufacturers that market bulk diesel additives with a sulfur content higher than 15 ppm and blenders that use them in nonroad diesel have additional requirements to ensure that the 15 ppm sulfur cap for NRLM diesel fuel is not exceeded.

The 15 ppm sulfur cap on highway diesel fuel that becomes effective in 2006 may encourage the gradual retirement of additives that do not meet a 15 ppm sulfur cap. The 15 ppm sulfur cap for NR fuel in 2010 and for LM fuel in 2012 may further this trend. However, we do not anticipate that this will result in disruption to additive users and producers or a significant increase in cost. Additive manufacturers commonly reformulate their additives on a periodic basis as a result of competitive pressures. We anticipate that any reformulation that might need to occur to meet a 15 ppm sulfur cap, will be accomplished prior to the implementation of the 15 ppm sulfur cap on highway diesel fuel in 2006.

Like the highway diesel fuel rule, this rule will limit the continued use in 15 ppm sulfur fuel of a bulk additive that exceeds 15 ppm sulfur to a concentration of less than one volume percent. We believe that this limitation is appropriate and will not cause any undue burden because the diesel fuel additives for which this flexibility was included are always used today at concentrations well below one volume percent. Further, one volume percent is the threshold above which the blender of an additive becomes subject to all the requirements applicable to a refiner. See 40 CFR 79.2(d)(1) and 40 CFR part 80.

fuel by hand blending into the vehicle fuel tank or fleet fuel storage tanks. Such additives are referred to as aftermarket additives. As discussed at the end of this section, today's rule contains different requirements regarding the use of aftermarket additives.

The specific requirements regarding the use of bulk diesel fuel additives in NRLM fuel subject to the 15 ppm sulfur standard are as follows:

- Bulk additives that have a sulfur content at or below 15 ppm must be accompanied by a PTD that states: “The sulfur content of this additive does not exceed 15 ppm.”
- Bulk additives that exceed 15 ppm sulfur could continue to be used in diesel fuel subject to the 15 ppm sulfur standard provided that they are used at a concentration of less than one volume percent and their transfer is accompanied by a PTD that lists the following:

- (1) A warning that the additive's sulfur content may exceed 15 ppm and that improper use of the additive may result in non-complying fuel,
- (2) The additive's maximum sulfur concentration,
- (3) The maximum recommended concentration for use of the additive in diesel fuel, and
- (4) The contribution to the sulfur level of the fuel that would result if the additive is used at the maximum recommended concentration.

We proposed that the affirmative defenses to presumptive liability for blenders of bulk additives with a sulfur content greater than 15 ppm must include periodic sulfur tests after the addition of the additive showing that the finished fuel does not exceed the 15 ppm sulfur cap. We are adopting this proposed requirement for additives other than static dissipater additives.

b. Static Dissipater Additives

Comments from diesel fuel distributors and additive manufacturers stated that static dissipater additives are unique among the various types of diesel fuel additives in that there are currently none available with a sulfur content below 15 ppm which are fully effective. Considering the lack of static dissipater additives meeting a 15 ppm sulfur cap, and the inability to add static dissipater (S-D) additives prior to shipment by pipeline, commenters stated that the prohibitive cost of testing fuel batches after the addition of static dissipater additives could discourage their use. To avoid the potential adverse impact on the safety of the fuel distribution industry which could result, commenters requested that we provide an alternative method for use in demonstrating their affirmative defense to presumptive liability when they use static dissipater additives with a sulfur content above 15 ppm. Manufacturers of static dissipater additives stated that due to very low treatment rates that are

needed for such additives, their use will raise the sulfur content of the finished fuel by no more than 0.02 ppm. Commenters stated that because of the extremely low potential contribution to the sulfur level of the finished diesel fuel which might result from the use of static dissipater additives, there was little risk that use of such additives would result in noncompliance with the 15 ppm sulfur cap.

We contacted all of the additive manufacturers that have registered static dissipater additives in EPA's Fuel and Fuel Additive Database.¹⁶² All of these manufacturers stated that there are no fully-effective static dissipater additives available that have a sulfur content below 15 ppm. They further stated that sulfur is an essential component in static dissipater additives, and that it is currently unclear how to formulate a static dissipater additive that would have a sulfur content below 15 ppm. Because of this input, we now recognize that static dissipater additives are in a unique category with respect to the ability to comply with a 15 ppm sulfur cap. Additive manufacturers stated that reformulation of static dissipater additives to meet a 15 ppm sulfur cap will likely be a lengthy undertaking.

It is unclear which of the naturally-occurring components in diesel fuel act to dissipate static electricity. However, certain batches of fuel are periodically found which do not have adequate static dissipating qualities. In such cases, static dissipater additives are necessary to prevent a static discharge from occurring during the transfer of fuel into a storage tank which might cause an explosion. Therefore, it is essential that today's rule is structured in such a way so as to not impede the use static dissipater additives. Because of the lack of static dissipater additives meeting a 15 ppm sulfur specification, the unique difficulty in reformulating them to meet a 15 ppm sulfur standard, the fact that they are essential to the safety of the fuel distribution system, and the impracticability for them to be added at the refinery, today's rule includes special affirmative defense provisions to reduce the sulfur testing burden associated with the use of static dissipater additives that have a sulfur content greater than 15 ppm.

Commenters suggested an alternative mechanism to demonstrate an affirmative defense to presumptive liability for blenders of static-dissipater (S-D) additives which would avoid the need to test every batch of fuel at the

¹⁶² All additives must be registered with EPA Fuel and Fuel Additive Database prior to their use in motor vehicle diesel fuel.

terminal after additization. Under this approach, blenders of S-D additives would be required to provide volume accounting reconciliation (VAR) records similar to those under EPA's deposit control additive rule (40 CFR part 80, subpart G) which would show whether the S-D additive is being added at the appropriate rate on average over a course of a monthly accounting period. Today's rule finalizes the approach suggested by commenters with certain modifications. In cases where a violation of the 15 ppm sulfur cap for diesel fuel is discovered on a batch of fuel downstream of a blender of S-D additives that have a sulfur content above 15 ppm, the S-D additive blender must provide the following information to EPA in order to meet their affirmative defense to presumptive liability regarding the potential that the use of S-D additive might have caused or contributed to the violation:

- A sulfur test on the diesel batch prior to the addition of the S-D additive package that indicates that the additive, when added, will not cause the fuel to exceed 15 ppm
- A product transfer document that accompanied the transfer of the S-D additive package to the additive blender which contains the following:
 - A statement that the S-D additive package exceeds 15 ppm in sulfur content and that special requirements apply if it is to be used in diesel fuel subject to the 15 ppm sulfur cap.
 - The maximum sulfur level of the S-D additive package including other additive components such as diesel detergents and carrier fluid to the extent that they are part of the package. Each component of the additive package other than the S-D additive itself must comply with the 15 ppm sulfur cap.
 - The maximum recommended concentration for the S-D additive package.
 - The contribution to the final sulfur content of a finished fuel when the additive is added at the maximum recommended concentration. The maximum recommended concentration must result in a potential increase in the sulfur content of the finished fuel of no more than 0.05 ppm.
- Monthly volume accounting reconciliation (VAR) records that include:
 - The amount of S-D additive package used during the month
 - The volume of the fuel into which the additive was injected during the month
 - The measured sulfur level of each fuel batch prior to injection of the additive

which shows that the contribution to the sulfur level of the finished diesel fuel from the use of the additive at the treatment level at which it was injected would not cause any such batch of fuel to exceed the 15 ppm sulfur specification

- Quality assurance records which show that the precision of the additive injection equipment has been maintained in such a manner as to prevent malfunctions which could result in the injection of the S-D additive at a higher concentration than that reported.

The additive blender must also be able to meet its normal diesel fuel defense elements: That the additive blender-fuel distributor did not cause the violation; that PTDs account for all the fuel and show apparent compliance; and that quality assurance sampling and testing has occurred, as modified by the discussion above.

In addition, the ratio of the amount of additive used to the amount of fuel into which the additive was injected over any given monthly VAR period must not exceed the maximum treatment rate which could be added to any batch of fuel additized during the period. If not, the blender could be liable for any batch of diesel fuel found that exceeded the 15 ppm sulfur cap which had been in their possession. The above provisions are only relevant for establishing affirmative defense to presumptive liability regarding the potential that the use of S-D additives might have caused a violation. Under no circumstances may an additive blender cause the sulfur level of any batch of finished fuel to exceed the 15 ppm sulfur cap. Blenders of S-D additives must meet all other requirements for distributors of 15 ppm sulfur diesel fuel. Regardless of the cause of a violation of the 15 ppm sulfur standard, any party that had custody or title of off-specification fuel is potentially liable and responsible for their affirmative defense elements.

These provisions may only be used for static dissipater additives which have the potential to raise the sulfur content of the finished fuel by no more than 0.050 ppm when used at their maximum recommended treatment level. Based on the input from additive manufacturers noted above, this will allow the use of S-D additives that are fully effective for this purpose. The use of S-D additives that might have a higher contribution to the sulfur content of the finished fuel, therefore, is unnecessary. To establish affirmative defense to presumptive liability, blenders that use S-D additives that could contribute more than 0.050 ppm to the sulfur content of a finished fuel

subject to the 15 ppm sulfur specification when used at the maximum recommended treatment level are required to conduct a sulfur test on the fuel batch after the addition of the additive. Blenders of additives other than S-D additives which have a sulfur content greater than 15 ppm into diesel fuel subject to the 15 ppm sulfur standard are also required to conduct a sulfur test on the fuel batch after the addition of the additive for affirmative defense purposes.

EPA may require additive manufacturers to supply samples of the additive packages (or the components additives in such packages) that are used in 15 ppm sulfur diesel fuel, or may sample from additive batches already in the distribution system. In such cases, we may test the sulfur content of these additives to evaluate whether they are in compliance with the information provided on the PTDs or other relevant documentation. In cases where a violation is discovered, any party in the distribution system that had custody of the additive batch found to be in violation may be held presumptively liable for the violation.

Today's rule amends the highway diesel regulation so that the provisions finalized today regarding the use of S-D additives with a sulfur content above 15 ppm in NRLM diesel fuel also apply to the use of such additives in highway diesel fuel subject to a 15 ppm sulfur standard. However, we continue to be concerned about the use of additives having a sulfur content greater than 15 ppm. We will continue to monitor this issue and may initiate an additional rulemaking in the future to consider further limiting or prohibiting the use of greater than 15 ppm sulfur additives in diesel fuel subject to a 15 ppm sulfur cap.

The special provisions for static-dissipater additives finalized in today's rule will ensure that the unique challenges regarding the manufacture and use of such additives do not present a barrier to their continued use. Additive manufacturers have stated that they are working on reformulation of their S-D additives to meet a 15 ppm sulfur limit.

We recently learned that industry is beginning to develop a standardized test to quantify the concentration of static-dissipater additives in finished fuel.¹⁶³ If such a test were available, it might be useful for establishing an additive blender's affirmative defense to presumptive liability in place of some of the VAR provisions described above. If

¹⁶³ Phone conversation with Eon McMullen, Octel additives, February 12, 2004.

a batch of fuel was found to exceed the 15 ppm sulfur cap, the use of such a test would allow for the measurement of the contribution to the sulfur level of the finished fuel which resulted from the addition of the static dissipater additive. If the contribution was below the permissible level given the sulfur measurements on each batch of fuel additized with the greater than 15 ppm S-D additive, it might be useful in association with other blender records to demonstrate that the additive blender was not at fault for the violation. If such a standardized test becomes available, EPA will work with the appropriate industry parties to evaluate its applicability for affirmative defense purposes, and conduct a rulemaking if appropriate to amend the elements required to establish affirmative defense to presumptive liability under the NRLM and highway diesel programs.

c. Additives Used in 500 ppm Sulfur Diesel Fuel

The 1993 and 2007 highway diesel programs did not contain any requirements regarding the maximum sulfur content of additives used in highway diesel fuel subject to a 500 ppm sulfur cap.¹⁶⁴ Our experience under the highway program indicates that application of the 500 ppm sulfur cap throughout the distribution system to the end-user has been sufficient to prevent the use of additives from jeopardizing compliance with the 500 ppm sulfur standard. The potential increase of several ppm in the sulfur content of diesel fuel which might result from the use of some diesel additives raises substantial concerns regarding the impact on compliance with a 15 ppm sulfur cap. However, this is not the case with respect to the potential impact on compliance with a 500 ppm sulfur cap. The current average sulfur content of highway diesel fuel of 340 ppm provides ample margin for the minimal increase in the fuel sulfur content which might result from the use of additives. We expect that this will also be the case for NRLM fuel subject to the 500 ppm sulfur standard. Therefore, we are not finalizing any requirements regarding the sulfur content of additives used in NRLM fuel subject to the 500 ppm

¹⁶⁴ The 500 ppm sulfur highway diesel final rule contains the requirement that highway diesel fuel not exceed 500 ppm sulfur at any point in the fuel distribution system including after the blending of additives. Fuel Quality Regulations for Highway Diesel Fuel Sold in 1993 and Later Calendar Years, Final Rule, 55 FR 34120, August 21, 1990.

sulfur standard. We believe that the requirement that NRLM fuel comply with a 500 ppm sulfur cap throughout the distribution system to the end-user will be sufficient to ensure that entities who introduce additives into such fuel take into account the potential increase in fuel sulfur content.

d. Aftermarket Additives

We believe that more stringent requirements are needed for aftermarket additives than for bulk additives due to the lack of practical safeguards to ensure that the use of such additives do not cause a violation of the sulfur standards in today's rule. Also, the presence of multiple grades of aftermarket additives, some suitable for use in engines equipped with sulfur sensitive emissions control equipment as well as pre-control engines, and some suitable for use only in pre-control engines would raise significant concerns regarding the misuse. The misuse of a high sulfur additive in an engine with sulfur sensitive emissions control equipment could damage this equipment. Therefore, today's rule requires that all aftermarket additives sold for use in nonroad, locomotive, and marine equipment must meet a 500 ppm sulfur cap beginning June 1, 2007, and that all aftermarket additives sold for use in nonroad equipment must meet a 15 ppm sulfur specification beginning June 1, 2010. After June 1, 2010, aftermarket additives with a sulfur content less than 500 ppm may continue to be used in locomotive and marine engines. This approach is consistent with that taken in the highway diesel rule which requires all aftermarket additives to meet a 15 ppm sulfur specification beginning June 1, 2006.

6. End User Requirements

In light of the importance of ensuring that the proper fuel is used in nonroad, locomotive, and marine engines covered by this program, any person is prohibited from fueling such an engine with fuel not meeting the applicable sulfur standard.

Specifically:

(1) No person may introduce, or permit the introduction of fuel containing the heating oil marker into nonroad, locomotive, marine or highway diesel engines;

(2) No person may introduce, or permit the introduction of, fuel that exceeds 15 ppm sulfur content into nonroad equipment with a model year 2011 or later engine;

(3) Beginning December 1, 2010, no person may introduce, or permit the introduction of any fuel exceeding 500 ppm sulfur content into any nonroad, locomotive, and marine engine; and

(4) Beginning December 1, 2014, no person may introduce, or permit the introduction of any fuel exceeding 15 ppm sulfur content into any nonroad diesel engine regardless of year of manufacture.

D. Diesel Fuel Sulfur Sampling and Testing Requirements

1. Testing Requirements

Today's action provides a new approach for fuel sulfur measurement. The details of this approach are described below, followed by a description of who will be required to conduct fuel sulfur testing as well as what fuel must be tested. The diesel fuel sulfur sampling and testing provisions described below are similar to those that were proposed. Adjustments we made to the proposed provisions were in response to comments we received during the public comment period.

a. Test Method Approval, Record-keeping, and Quality Control Requirements

Most current and past EPA fuel programs designated specific analytical methods which refiners, importers, and downstream parties¹⁶⁵ use to analyze fuel samples at all points in the fuel distribution system for regulatory compliance purposes. Some of these programs have also allowed certain specific alternative methods which may be used as long as the test results are correlated to the designated test method. The highway diesel rule (66 FR 5002, January 18, 2001), for example, specifies one designated test method and three alternative methods for measuring the sulfur content of highway diesel fuel subject to the 15 ppm sulfur standard. The rule also specifies one designated method and three alternative methods for measuring the sulfur content of highway diesel fuel subject to the 500 ppm sulfur standard.

¹⁶⁵ Other EPA fuels regulations have allowed downstream parties conducting periodic quality assurance testing for defense purposes to use methods other than the designated method, so long as the method is an ASTM method appropriate for testing for the applicable fuel property, and so long as the instrument is correlated to the designated method.

TABLE V.H-1.—DESIGNATED AND ALTERNATIVE SULFUR TEST METHODS ALLOWED UNDER THE HIGHWAY DIESEL PROGRAM

Sulfur Test Method	500 ppm	15 ppm
ASTM D 2622-03, as modified, Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry.	Designated	Alternative.
ASTM D 3120-03a, Standard Test Method for Trace Quantities of Sulfur in Light Liquid Petroleum Hydrocarbons by Oxidative Microcoulometry.	Alternative.
ASTM D 4294-03, Standard Test Method for Sulfur in Petroleum and Petroleum Products by Energy-Dispersive X-ray Fluorescence Spectrometry.	Alternative	
ASTM D 5453-03a, Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Motor Fuels and Motor Oils by Ultraviolet Fluorescence.	Alternative	Alternative.
ASTM D 6428-99, Test Method for Total Sulfur in Liquid Aromatic Hydrocarbons and Their Derivatives by Oxidative Combustion and Electrochemical Detection.	Alternative	Designated.

The highway diesel fuel rule also announced the Agency's intention to adopt a performance-based test method approach in the future, as well as our intention to continue working with the industry to develop and improve sulfur test methods. Today's action adopts such a performance-based test method approach for both highway and NRLM diesel fuel subject to the 15 ppm and 500 ppm sulfur standards. In addition, the current approach for measuring the sulfur content of diesel fuel subject to the 500 ppm sulfur standard, *i.e.*, using the designated sulfur test method or one of the alternative test methods with correlation will remain applicable.

Under the performance-based approach, a given test method can be approved for use in a specific laboratory by meeting certain precision and accuracy criteria specified in the regulations. The method can be approved for use by that laboratory as long as appropriate quality control procedures are followed. Properly selected precision and accuracy values allow multiple methods and multiple commercially available instruments to be approved, thus providing greater flexibility in method and instrument selection while also encouraging the development and use of better methods and instrumentation in the future. Under today's rule, there is no designated sulfur test method as specified under previous regulations.

Since any test method that meets the specified performance criteria may qualify, this type of approach does not conflict with the "National Technology Transfer and Advancement Act of 1995" (NTTAA), section 12(d) of Public Law 104-113, and the Office of Management and Budget (OMB) Circular A-119. Both of these are designed to encourage the adoption of standards developed by "voluntary consensus standards bodies" (VCSB)¹⁶⁶ and to reduce reliance on

government-unique standards where such consensus standards would suffice. Under the performance criteria approach in today's rule, methods developed by consensus bodies as well as methods not yet approved by a consensus body qualify for approval provided they meet the specified performance criteria as well as the record-keeping and reporting requirements for quality control purposes.

i. How Can a Given Method Be Approved?

A given test method can be approved for use under today's program by meeting certain precision and accuracy criteria. Approval applies on a laboratory/facility-specific basis. If a company chooses to employ more than one laboratory for fuel sulfur testing purposes, then each laboratory must separately seek approval for each method it intends to use. Likewise, if a laboratory chooses to use more than one sulfur test method, then each method must be approved separately. Separate approval is not necessary for individual operators or laboratory instruments within a given laboratory facility.

The specific precision and accuracy criteria were derived from existing sulfur test methods that are either required or allowed under the highway diesel fuel sulfur program. The first criterion, precision, refers to the consistency of a set of measurements and is used to determine how closely analytical results can be duplicated based on repeat measurements of the same material under prescribed conditions. To demonstrate the precision of a given sulfur test method under the performance-based approach, a laboratory facility must perform 20 repeat tests over 20 days on samples taken from a homogeneous supply of a commercially available diesel fuel. Based on the comments we received on

this issue, we are also clarifying that the test results must in general be a sequential record of the analyses with no omissions. A laboratory facility may exclude a given sample or test result only if (1) the exclusion is for a valid reason under good laboratory practices and (2) it maintains records regarding the sample and test results and the reason for excluding them. Using the test results¹⁶⁷ of ASTM D 3120 for diesel fuel subject to the 15 ppm sulfur standard, the precision must be less than 0.72 ppm.¹⁶⁸ Similarly, using the test results of ASTM D 2622 for diesel fuel subject to the 500 ppm sulfur standard, the precision must be less than 9.68 ppm.

The second criterion, accuracy, refers to the closeness of agreement between a measured or calculated value and the actual or specified value. To demonstrate the accuracy of a given test method under the performance-based approach, a laboratory facility is required to perform 10 repeat tests on a

¹⁶⁷ Sulfur Repeatability of Diesel by Method at 15 ppm, ASTM Report on Low Level Sulfur Determination in Gasoline and Diesel Interlaboratory Study—A Status Report, June 2002.

¹⁶⁸ 0.72 ppm is equal to 1.5 times the standard deviation of ASTM D 3120, where the standard deviation is equal to the repeatability of ASTM D 3120 (1.33) divided by 2.77. 9.68 ppm is equal to 1.5 times the standard deviation of ASTM D 2622, where the standard deviation is equal to the repeatability of ASTM D 2622 (17.88) divided by 2.77. In the proposal, we stated that the repeatability of ASTM D 2622 was 26.81. While that reported value was incorrect due to either a typographical or a computational error, the resulting precision value that we are finalizing today was correctly calculated and reported as 9.68 ppm. The "sample standard deviation" should be used for this purpose. By its use of N-1 in the denominator, this measure applies a correction for the small sample bias and provides an unbiased estimate of the standard deviation of the larger population from which the sample was drawn. Since the conditions of the precision qualification test admit more sources of variability than the conditions under which ASTM repeatability is determined (longer time span, different operators, environmental conditions, etc.) the repeatability standard deviation derived from the round robin was multiplied by what we believe to be a reasonable adjustment factor, 1.5, to compensate for the difference in conditions.

¹⁶⁶ These are standard-setting organizations, like ASTM, and ISO that have broad representation of

all interested stakeholders and make decisions by consensus.

standard sample, the mean of which for diesel fuel subject to the 15 ppm sulfur standard can not deviate from the Accepted Reference Value (ARV) of the standard by more than 0.54 ppm and for diesel fuel subject to the 500 ppm sulfur standard can not deviate from the ARV of the standard by more than 7.26 ppm¹⁶⁹. These tests must be performed using commercially available gravimetric sulfur standards. Ten tests are required using each of two different sulfur standards. For 15 ppm fuel, one must be in the range of 1–10 ppm sulfur and the other in the range of 10–20 ppm sulfur. For 500 ppm fuel, one must be in the range of 100–200 ppm sulfur and the other in the range of 400–500 ppm sulfur for 500 ppm sulfur diesel fuel. Therefore, a minimum of 20 total tests is required for sufficient demonstration of accuracy for a given sulfur test method at a given laboratory facility. As with the requirement for precision demonstration described above, the test results must be a sequential record of the analyses with no omissions. Finally, any known interferences for a given test method must be mitigated.

Some commenters remarked that the ARV of the standards does not account for any uncertainty given that all commercially available standards have an uncertainty associated with the certified value. The commenters added that EPA should specify what maximum value in the uncertainty associated with the ARV is allowed.

These requirements are not intended to be overly burdensome. Indeed, we believe these requirements are equivalent to what a laboratory would do during the normal start up procedure for a given test method. In addition, we believe this approach will allow regulated entities to know that they are measuring diesel fuel sulfur levels accurately and within reasonable site reproducibility limits.

ii. What Information Must Be Reported to the Agency?

For test methods that have already been approved by a VCSB, such as ASTM or the International Standards Organization (ISO), each laboratory facility must report to the Agency the precision and accuracy results as described above for each method for which it is seeking approval. Such submissions to EPA, as described elsewhere, are subject to the Agency's review for 90 days, and the method will be considered approved in the absence of EPA comment. Laboratory facilities

are required to retain the fuel samples used for precision and accuracy demonstration for 90 days. While we proposed a 30 day sample retention period, commenters stated that the sample retention period for fuel samples that are used for precision and accuracy demonstrations should be equivalent to the length of EPA's review period (*i.e.*, 90 days). We agree with the commenters and are thus finalizing a 90 day sample retention period in today's rule. This sample retention requirement also applies to non-VCSB methods which are described below.

For test methods that have not been approved by a VCSB, full test method documentation, including a description of the technology/instrumentation that makes the method functional, as well as subsequent EPA approval of the method is also required. These submissions will also be subject to the Agency's review for 90 days, and the method will be considered approved in the absence of EPA comment. Submission of VCSB methods is not required since they are available in the public domain. In addition, industry and the Agency will likely have had substantial experience with such methods.

As described above, federal government and EPA policy is to use standards developed by voluntary consensus bodies when available. The purpose of the NTTAA, at least in part, is to foster consistency in regulatory requirements, to take advantage of the collective industry wisdom and wide-spread technical evaluation required before a test method is approved by a consensus body, and to take advantage of the ongoing oversight and evaluation of a test method by the consensus body that results from wide-spread use of an approved method *e.g.*, the ongoing round-robin type analysis and typical annual updating of the method by the consensus body. These goals are not met where the Agency allows use of a non-consensus body test method in perpetuity. Moreover, it is not possible to realize many of the advantages that result from consensus status where a test method is used by only one or a few companies. It will not have the practical scrutiny that comes from ongoing wide-spread use, or the independent scrutiny of the consensus body and periodic updating. In addition, EPA does not have the resources to conduct the degree of initial scrutiny or ongoing scrutiny that are practiced by consensus bodies. Nevertheless, EPA believes it is appropriate to allow limited use of a proprietary test method for a limited time, even though the significant advantages of consensus test methods are absent, because EPA can evaluate

the initial quality of a method and a company may have invested significant resources in developing a method. However, if after a reasonable time a test method fails to gain consensus body approval, EPA believes approval of the method should be withdrawn because of the absence of ongoing consensus oversight. Accordingly, a non-VCSB method will cease to be qualified five years from the date of its original approval by EPA in the absence of VCSB approval.

To assist the Agency in determining the performance of a given sulfur test method, non-VCSB methods, in particular, we reserve the right to send samples of commercially available fuel to laboratories for evaluation. Such samples are intended for situations in which the Agency has concerns regarding a test method and, in particular, its ability to measure the sulfur content of a random commercially available diesel fuel. Laboratory facilities are required to report their results from tests of this material to the Agency.

iii. What Quality Control Provisions Are Required?

We are requiring ongoing Quality Control (QC) procedures for sulfur measurement instrumentation. These are procedures used by laboratory facilities to ensure that the test methods they have qualified and the instruments on which the methods are run are yielding results with appropriate accuracy and precision, *e.g.*, that the results from a particular instrument do not "drift" over time to yield unacceptable values. It is our understanding that most laboratories already employ QC procedures, and that these are commonly viewed as important good laboratory practices. Laboratories will be required, at a minimum, to abide by the following QC procedures for each instrument used to test batches of diesel fuel under these regulations even where a laboratory elects to use the test method used to establish the precision and accuracy criteria finalized in today's rule:

(1) Follow the mandatory provisions of ASTM D 6299–02, *Standard Practice for Applying Statistical Quality Assurance Techniques to Evaluate Analytical Measurement System Performance*. Laboratories are required to construct control charts from the mandatory QC sample testing prescribed in paragraph 7.1, following the guidelines under A 1.5.1 for individual observation charts and A 1.5.2 for moving range charts.

(2) Follow ASTM D 6299–02 paragraph 7.3.1 (check standards) using

¹⁶⁹ 0.54 and 7.26 are equal to 0.75 times the precision values of 0.72 for 15 ppm sulfur diesel and 9.68 for 500 ppm sulfur diesel, respectively.

a standard reference material. Check standard testing is required to occur at least monthly and should take place following any major change to the laboratory equipment or test procedure. Any deviation from the accepted reference value of the check standard greater than 1.44 ppm for diesel fuel subject to the 15 ppm sulfur standard and 19.36 ppm for diesel fuel subject to the 500 ppm sulfur standard¹⁷⁰ must be investigated.

(3) Upon discovery of any QC testing violation of A 1.5.2.1 or A 1.5.3.2 or check standard deviation greater than 1.44 ppm and 19.36 ppm for 15 ppm sulfur diesel and 500 ppm sulfur diesel, respectively, as provided in item 2 above, any measurement made while the system was out of control must be tagged as suspect and an investigation conducted into the reasons for this anomalous performance. Refiners and importers are required to retain batch samples for 30 days or the period equal to the interval between QC sample tests, whichever is longer. If an instrument is found to be out of control, all of the retained samples since the last time the instrument was shown to be in control must be retested.

(4) QC records, including investigations under item 3 above must be retained for five years and must be provided to the Agency upon request.

b. Requirements To Conduct Fuel Sulfur Testing

Given the importance of assuring that NRLM diesel fuel designated to meet the 15 ppm sulfur standard in fact meets that standard, we are requiring that refiners, importers, and transmix processors test each batch of NRLM diesel fuel designated to meet the 15 ppm sulfur standard and maintain records of such testing. Requiring that refiners, importers, and transmix processors test each batch of fuel subject to the 15 ppm sulfur NRLM standard assures that compliance can be confirmed through testing records, and even more importantly, assures that diesel fuel exceeding the 15 ppm standard is not introduced into commerce as fuel for use in nonroad equipment having sulfur-sensitive emission control devices. Batch testing was not required under the highway diesel fuel rule. Instead, such testing was expected to be performed to establish a defense to potential liability. However, for the same reasons discussed above, today's rule extends

¹⁷⁰ 1.44 ppm is equal to two times the precision value of 0.72 ppm for 15 ppm diesel and 19.36 is equal to two times the precision value of 9.68 ppm for 500 ppm diesel.

this batch testing requirement to 15 ppm sulfur highway diesel fuel beginning in 2006.

In order to address situations where refiners produce NRLM diesel fuel using computer-controlled inline blending equipment and do not have storage tanks from which to withdraw samples, we are including in today's final rule a provision to allow refiners to test a composited sample of a batch of diesel fuel for its sulfur content after the diesel fuel has been shipped from the refinery. This inline blending provision is similar to the provision that exists under the reformulated gasoline and gasoline sulfur programs and applies to both highway and NRLM diesel fuel under today's action.

Today's rule does not require downstream parties to conduct every-batch testing. However, we believe that most downstream parties will voluntarily conduct "periodic" sampling and testing for quality assurance purposes if they want to establish a defense to presumptive liability, as discussed in section V.H. below.

2. Two Part-Per-Million Downstream Sulfur Measurement Adjustment

We believe that it is appropriate to recognize sulfur test variability in determining compliance with the 15 ppm sulfur NRLM diesel fuel standards downstream of a refinery or import facility. Thus, today's rule provides that for all 15 ppm sulfur NRLM diesel fuel at locations downstream of a refinery or import facility, sulfur test results can be adjusted by subtracting two ppm. In the same manner as finalized for 15 ppm sulfur highway diesel fuel, the sole purpose of this downstream compliance provision is to address test variability concerns (see the highway diesel fuel rule). We received comments suggesting that a higher downstream test tolerance is needed based on the current values for test method variability. However, we anticipate that the reproducibility of sulfur test methods is likely to improve to two ppm or even less by the time the 15 ppm sulfur standard for highway diesel fuel is implemented—four years before implementation date of the 15 ppm standard for NRLM diesel fuel. With this provision, we anticipate that refiners will be able to produce diesel fuel with an average sulfur level of approximately 7–8 ppm and some contamination could occur throughout the distribution system, without fear of causing a downstream violation due solely to test variability. As test methods improve in the future, we will reevaluate whether two ppm is the appropriate allowance for purposes of

this compliance provision. We also received comments that a test tolerance should be provided in determining compliance with the 500 ppm sulfur standards for NRLM fuel. We believe that such a tolerance is not needed for fuels subject to a 500 ppm sulfur standard because of the flexibility that refiners possess to produce fuel with a sufficiently low sulfur content to accommodate test variability.

3. Sampling Requirements

Today's rule adopts the same sampling methods adopted by the highway diesel rule (66 FR 5002, January 18, 2001). These sampling methods are American Society for Testing and Materials (ASTM) D 4057–95 (manual sampling) and D 4177–95 (automatic sampling from pipelines/inline blending). The requirement to use these methods becomes effective for NRLM diesel fuel on June 1, 2007. These same methods were also adopted for use in the Tier 2/Gasoline Sulfur rule.¹⁷¹

4. Alternative Sampling and Testing Requirements for Importers of Diesel Fuel Who Transport Diesel Fuel by Tanker Truck

We understand that importers who transport diesel fuel into the U.S. by tanker truck are frequently relatively small businesses that could be subject to a substantial burden if they were required to sample and test each batch of NRLM or highway diesel fuel imported by truck, especially where a trucker imports many small loads of diesel fuel. Therefore, today's rule provides that truck importers may comply with an alternative sampling and testing requirement, involving a sampling and testing program of the foreign truck loading terminal, if certain conditions are met. For an importer to be eligible for the alternative sampling and testing requirement, the terminal must conduct sampling and testing of the NRLM or highway diesel fuel immediately after each receipt into its terminal storage tank but before loading product into the importer's tanker truck storage compartments or immediately prior to loading product into the importer's tanker truck if it hasn't tested after each receipt. Moreover, the importer will be required to conduct periodic quality assurance testing of the terminal's diesel fuel, and the importer will be required to assure EPA that we will be required to make unannounced

¹⁷¹ 65 FR 6833–34 (Feb. 10, 2000). Today's rule also provides that these methods be used under the RFG and CG rules. See 62 FR 37337 *et seq.* (July 11, 1997).

inspections and audits, to sample and test fuel at the foreign terminal facility, to assure that the terminal maintained sampling and testing records, and to submit such records to EPA upon request.

E. Selection of the Marker for Heating Oil

As discussed in section IV.D, to ensure that heating oil is not shifted into the NRLM market, we need a way to distinguish heating oil from high sulfur or 500 ppm sulfur NRLM diesel fuel produced under the small refiner and credit provisions in today's rule. Currently, there is no differentiation today between fuel used for NRLM uses and heating oil. Both are typically produced to the same sulfur specification, and both are required to have the same red dye added prior to distribution from downstream of the terminal. Based on recommendations from refiners, in the NPRM, we concluded that the best approach to differentiate heating oil from NRLM diesel fuel would be to require that a marker be added to heating oil at the refinery gate. Since the proposal we received additional information which allows us to rely upon record-keeping and reporting provisions to differentiate heating oil from NRLM up to the point where it leaves the terminal (see section IV.D). Therefore, today's rule requires that a marker be added to heating oil before it leaves the terminal gate rather than the refinery gate as proposed.¹⁷²

Section IV.D of today's preamble also discusses the need to distinguish 500 ppm sulfur locomotive and marine fuel produced by refiners and imported from 2010–2012 from 500 ppm sulfur nonroad diesel fuel produced during this time frame under the small refiner, credit, and downstream flexibility provisions in today's rule. Without this ability, it would be possible for 500 ppm sulfur LM diesel fuel to be shifted into the nonroad market during this time period outside of the Northeast/Mid-Atlantic Area and Alaska. Therefore, today's rule requires that from June 1, 2010 through May 31, 2012, the same marker added to heating oil must also be added to 500 ppm sulfur LM diesel fuel produced by a refiner or imported for use outside of the Northeast/Mid-Atlantic Area and Alaska before the fuel leaves the terminal. Nonroad diesel fuel meeting a 500 ppm sulfur standard produced under the small refiner or credit provisions, and 500 ppm sulfur

NRLM diesel fuel generated under the downstream flexibility provisions in today's rule could be sold into the LM market outside of the Northeast/Mid-Atlantic Area and Alaska. Such 500 ppm sulfur NRLM diesel fuel does not need to be marked. Therefore, both marked and unmarked 500 ppm sulfur diesel fuel could be used in locomotive and marine diesel equipment outside of the Northeast/Mid-Atlantic Area and Alaska from 2010 through 2012.¹⁷³

As discussed in section IV.D., use of the same marker in heating oil and 500 ppm sulfur LM fuel is feasible because the underlying goal is the same, *i.e.*, keeping 500 ppm sulfur diesel fuel produced as heating oil or LM fuel from being shifted into the nonroad diesel market from 2010 through 2012. We will be able to determine whether heating oil with a sulfur content greater than 500 ppm has been shifted into the LM market downstream of the terminal by testing the sulfur content of LM. 500 ppm fuel initially designated as heating oil can be later shifted into the LM market, since the sulfur standard for LM diesel fuel during this period is 500 ppm.

Terminal operators suggested that we might be able to rely on record-keeping and reporting downstream of the terminal as well as above the terminal level, thereby eliminating any need for a fuel marker. However, we believe such record-keeping and reporting mechanisms would be insufficient to keep heating oil out of the NRLM market and 500 ppm sulfur LM fuel produced by a refiner or imported out of the nonroad market downstream of the terminal under typical circumstances. We can rely on such measures before the fuel leaves the terminal because it is feasible to require all of the facilities in the distribution system to report to EPA on their fuel transfers. As discussed in section IV.D., these electronic reports can be compared by EPA to identify parties responsible for shifting heating oil into the NRLM market from 2007–2014, 500 ppm sulfur LM fuel into the nonroad market from 2010–2012, and heating oil into the LM market beginning 2014. Downstream of the terminal the parties involved in the fuel distribution system become far too numerous for such a system to be implemented and enforced (including jobbers, bulk plant operators,

heating oil dealers, retailers, and even end-users with storage tanks such as farmers. Reporting errors for even a small fraction would require too many resources to track down and correct and would eliminate the effectiveness of the system.

Our proposal envisioned that a fuel marker would be required in heating oil from June 1, 2006 through May 31, 2010, and that the same marker would be required in locomotive and marine fuel from June 1, 2010 through May 31, 2014. As a consequence of finalizing the 15 ppm sulfur standard for locomotive and marine fuel in 2012, we no longer need to require that LM diesel fuel be marked after June 1, 2012. The 2010–2012 marking requirement for 500 ppm sulfur LM diesel fuel does not apply to 500 ppm sulfur LM fuel produced by a refiner or imported in the Northeast/Mid-Atlantic Area or in Alaska. There is an ongoing need to require the continued use of the marker in heating oil indefinitely (see section IV of today's preamble).

We proposed that beginning June 1, 2007 SY–124 must be added to heating oil in the U.S. at a concentration of 6 milligrams per liter (mg/L). Today's rule adopts this requirement except for heating oil used in the Northeast/Mid-Atlantic Area and Alaska.¹⁷⁴ The chemical composition of SY–124 is as follows: N-ethyl-N-[2-[1-(2-methylpropoxy)ethoxy]-4-phenylazo]-benzeneamine.¹⁷⁵ This concentration is sufficient to ensure detection of SY–124 in the distribution system, even if diluted by a factor of 50. Any fuel found with a marker concentration of 0.1 milligrams per liter or more will be presumed to be heating oil. Below this level, the prohibition on use in highway, nonroad, locomotive, or marine applications would not apply.

There are a number of other types of dyes and markers. Visible dyes are most common, are inexpensive, and are easily detected. Using a second dye in addition to the red dye required by IRS in all non-highway fuel for segregation of heating oil based on visual identification raises certain challenges. The marker that we require in heating oil and 500 ppm sulfur LM diesel fuel must be different from the red dye currently required by IRS and EPA and not interfere with the identification of red dye in distillate fuels. Invisible

¹⁷² Heating oil sold inside the Northeast/Mid-Atlantic Area adopted under today's rule and Alaska does not need to contain a marker (see section IV.D.).

¹⁷³ Inside the Northeast/Mid-Atlantic Area, 500 ppm sulfur fuel produced from transmix or segregated interface could be sold into the LM or heating oil markets from 2010–2012, and could only be sold into the heating oil market after 2012. Outside of the Northeast/Mid-Atlantic Area, such fuel could be sold into the NRLM market from 2010–2012, and into the LM market thereafter.

¹⁷⁴ See section IV.D of today's preamble for a discussion of the provisions for the Northeast/Mid-Atlantic Area and Alaska.

¹⁷⁵ Opinion on Selection of a Community-wide Mineral Oils Marking System, ("Euromarker"), European Union Scientific Committee for Toxicity, Ecotoxicity and the Environment plenary meeting, September 28, 1999.

markers are beginning to see more use in branded fuels and are somewhat more expensive than visible markers. Such markers are detected either by the addition of a chemical reagent or by their fluorescence when subjected to near-infra-red or ultraviolet light. Some chemical-based detection methods are suitable for use in the field. Others must be conducted in the laboratory due to the complexity of the detection process or concerns regarding the toxicity of the reagents used to reveal the presence of the marker. Near-infra-red and ultraviolet fluorescent markers can be easily detected in the field using a small device and after brief training of the operator. There are also more exotic markers available such as those based on immunoassay, and isotopic or molecular enhancement. Such markers typically need to be detected by laboratory analysis.

We selected SY-124, however, for a number of reasons:

- (1) There is considerable data and experience with it which indicates there are no significant issues with its use;
- (2) It is compatible with the existing red dye;
- (3) Test methods exist to quantify its concentration, even if diluted by a factor of 50 to one;
- (4) It is reasonably inexpensive; and
- (5) It can be produced and provided by a number of sources.

Effective in August 2002, the European Union (EU) enacted the requirement that SY-124 be added at 6 mg/L to diesel fuel that is taxed at a lower rate in all EU member states.¹⁷⁶ Solvent yellow 124 is referred to as the "Euromarker" in the EU. The EU has found this treatment rate to be sufficient for their enforcement purposes while not interfering with the identification of the various different colored dyes required by different EU member states (including the same red dye that is required in the U.S.). Despite its name, SY-124 does not impart a strong color to diesel fuel when used at a concentration of 6 mg/L. Most often it is reportedly nearly invisible in distillate fuel given that the slight yellow color imparted is similar to the natural color of many distillate fuels.¹⁷⁷ In the presence of red dye, SY-124 can impart a slight orange tinge to the fuel. However, it does not interfere with the visual identification of the presence of red dye or the quantification of the

concentration of red dye in distillate fuel. Thus, the use of SY-124 at 6 mg/L in diesel fuel would not interfere with the use of the red dye by IRS to identify non-taxed fuels.

Solvent yellow 124 is chemically similar to other additives used in gasoline and diesel fuel, and has been registered by EPA as a fuel additive under 40 CFR part 79. Therefore, we expect that its products of combustion would not have an adverse impact on emission control devices, such as a catalytic converter. Extensive evaluation and testing of SY-124 was conducted by the European Commission. This included combustion testing which showed no detectable difference between the emissions from marked and unmarked fuel. Norway specifically evaluated the use of distillate fuel containing SY-124 for heating purposes and determined that the presence of the Euromarker did not cause an increase in harmful emissions from heating equipment. Based on the European experience with SY-124, we do not expect that there would be concerns regarding the compatibility of SY-124 in the U.S. fuel distribution system or for use in motor vehicle engines and other equipment such as in residential furnaces.

Our evaluation of the process conducted by the EU in selecting SY-124 for use in the EU convinced us that SY-124 was also the most appropriate marker to propose for use in heating oil under today's program. We received a number of comments expressing concern about the use of SY-124 in heating oil. Based on our evaluation of these comments (summarized below and in the S&A), we continue to believe that SY-124 is the most appropriate marker to specify for use in heating oil and 500 ppm sulfur LM diesel fuel under today's rule. Therefore, today's rule requires that beginning June 1, 2007, SY-124 be added to heating oil, and that from June 1, 2010 through May 31, 2012, SY-124 be added to 500 ppm sulfur LM diesel fuel produced by a refiner or imported at a concentration of 6 mg/L before such fuel leaves the terminal except in the Northeast/Mid-Atlantic Area and Alaska.

The concerns regarding the use of SY-124 in heating oil primarily pertained to: the potential impact on jet engines if jet fuel were contaminated with SY-124; the potential health effects of SY-124 when used in fuel for heating purposes, particularly for unvented heaters; the potential cost impact on fuel distributors and transmix processors; and the potential conflict with IRS red dye requirements.

The American Society of Testing and Materials (ASTM), the Coordinating Research Council (CRC), and the Federal Aviation Administration (FAA) requested that we delay finalizing the selection of a specific marker for use in heating oil in today's rule. They requested that selection of a specific marker should be deferred until testing could be conducted regarding the potential impact of SY-124 on jet engines. The Air Transport Association stated that EPA should conduct an extensive study regarding the potential for contamination, determine the levels at which the marker will not pose a risk to jet engines, and seek approval of SY-124 as a jet fuel additive. Other parties including the Department of Defense (DoD) also stated that EPA should refrain from specifying a heating oil marker under today's rule until industry and other potentially affected parties can recommend an appropriate marker. Representatives of the heating oil industry stated that they were concerned that EPA had not conducted an independent review regarding the safety/suitability of SY-124 for use in heating oil.

We met and corresponded with numerous and diverse parties to evaluate the concerns expressed regarding the use of SY-124, and to determine whether it might be more appropriate to specify a different marker for use in heating oil. These parties include IRS, FAA, ASTM, CRC, various marker/dye manufacturers, European distributors of fuels containing the Euromarker, marker suppliers, and members of all segments in the U.S. fuel distribution system.

We believe that concerns related to potential jet fuel contamination have been sufficiently addressed for us to finalize the selection of SY-124 as the required heating oil marker in today's rule.¹⁷⁸ As discussed in section IV.D of today's preamble, changes in the structure of the fuel program finalized in today's rule from that in the proposed program have allowed us to move the point where the marker must be added from the refinery gate to the terminal. The vast majority of concerns regarding the potential for contamination of jet fuel with SY-124 pertained to the shipment of marked fuel by pipeline. All parties were in agreement that nearly all of the potential for marker contamination of jet fuel would disappear if the point of marker addition was moved to the terminal. We

¹⁷⁶ The European Union marker legislation, 2001/574/EC, document C(2001) 1728, was published in the European Council Official Journal, L203 28.07.2001.

¹⁷⁷ The color of distillate fuel can range from near water white to a dark blackish brown but is most frequently straw colored.

¹⁷⁸ See the Summary and Analysis of Comments for a more detailed discussion of our response to concerns about the possible contamination of jet fuel with the marker prescribed for use in heating oil and 500 ppm sulfur LM fuel under today's rule.

spoke with terminal operators, both large and small, who confirmed that they maintain strictly segregated distribution facilities for red dyed fuel and jet fuel because of jet fuel contamination concerns. The same type of segregation practices will apply to the handling of marked heating oil, marked 500 ppm sulfur LM diesel fuel, and jet fuel since the marker will only be present in heating oil and locomotive and marine fuel when red dye is also present. Therefore, these practices will be equally effective in limiting contamination of jet fuel with SY-124. Downstream of the terminal, the only other chance for marker contamination of jet fuel pertains to bulk plant operators and jobbers that handle marked heating oil and jet fuel. For the most part, these parties also currently maintain strict segregation of the facilities used to transport jet fuel and heating oil. The one exception is that small bulk plant operators that supply small airports sometimes use the same tank truck to alternately transport jet fuel and heating oil. In such cases, they flush the tank compartment prior to transporting jet fuel to remove any residual heating oil left behind after the tank is drained. Since few, if any bulk plants handle LM fuel, it is unlikely that the same tank trucks will be used to alternately transport LM fuel and jet fuel. Thus, we expect that there will be even less chance for LM fuel containing the marker to contaminate jet fuel.

Today's rule requires that heating oil and locomotive and marine fuel which contains the marker must also contain visible evidence of red dye. Therefore, the "white bucket" test that distributors currently use to detect red dye contamination of jet fuel can also be relied upon to detect marker contamination of jet fuel. Based on the above discussion, we concluded that the required addition of the marker to heating oil and 500 ppm sulfur locomotive and marine fuel from 2010-2012 would not significantly increase the likelihood of jet fuel contamination, and that when such contamination might occur, it could be readily identified without the need for additional testing. Our finalization of the Northeast/Mid-Atlantic Area in (see section IV.D) also minimizes potential concerns regarding the potential that jet fuel may become contaminated with the marker, since no marker is required in this area. Furthermore, there is expected to be little heating oil used outside of the Northeast/Mid-Atlantic Area, the locomotive and marine market outside of the Northeast/Mid-Atlantic Area is limited. We anticipate that the

distribution of marked LM diesel fuel will primarily be by segregated pathways, and the duration of the marker requirement for 500 ppm sulfur LM diesel fuel produced by refiners or imported for use outside of the Northeast/Mid-Atlantic Area and Alaska is only two years. On the whole, we actually expect that today's rule will reduce the potential for jet fuel to become contaminated with the azo dyes such as the IRS-required red dye and SY-124 since visual evidence will no longer be required leaving the refinery gate in 500 ppm NRLM fuel beginning June 1, 2007, and will no longer be required in any off-highway diesel fuel beginning June 1, 2010.

This final rule requires addition of the marker at the terminal rather than the refinery gate as proposed. Based on this change, ASTM withdrew its request to delay the finalization of the marker requirements in today's rule. However, ASTM stated that some concern remains regarding jet fuel contamination downstream of the terminal (due to the limited use of the same tank wagons to alternately transport jet fuel and heating oil discussed above). Nevertheless, ASTM related that these concerns need not delay finalization of the marker requirements in this rule. ASTM intends to support a CRC program to evaluate the compatibility of markers with jet fuel. The Federal Aviation Administration is also undertaking an effort to identify fuel markers that would be compatible for use in jet fuel. We commit to a review of the use of SY-124 in the future based on the findings of the CRC and the FAA, experience with the use of SY-124 in Europe, and future input from ASTM or other concerned parties. If alternative markers are identified that do not raise concerns regarding the potential contamination of jet fuel, we will initiate a rulemaking to evaluate the use of one of these markers in place of SY-124.

Since the NPRM, no new information has been provided which indicates that the combustion of SY-124 in heating equipment would result in more harmful emissions than when combusted in engines, or would result in more harmful emissions than combustion of unmarked heating oil. The European experience with the use of SY-124 and the evaluation process it underwent prior to selection by the EU, provides strong support regarding the compatibility of SY-124 in the U.S. fuel distribution system, and for use in motor vehicle engines and other equipment such as in residential furnaces and nonroad, locomotive, and marine engines. We believe that concerns regarding the potential health

impacts from the use of SY-124 do not present sufficient cause to delay finalization of the requirement for its use that is contained in today's rule.

The European Union intends to review the use of SY-124 after December 2005, but may undertake the review earlier if any health and safety or environmental concerns about its use are raised. We intend to keep abreast of such activities and may initiate our own review of the use of SY-124 depending on the European Union's findings, or other relevant information. There will be nearly four years of accumulated field experience with the use of SY-124 in Europe at the time of the review by the EU and nearly 5 years by the implementation of the marker requirement under today's rule. This will provide ample time for any potential unidentified issues with SY-124 to be identified, and for us to choose a different marker if warranted.

Commenters stated that potential health concerns regarding the use of SY-124 might be exacerbated with respect to its use in unvented space heaters. Commenters further stated that there are prohibitions against the dyeing of kerosene (No. 1 diesel) used in such heaters. No information was provided to support these concerns, however, and we have no information to suggest any health concerns exist regarding the use of SY-124 in unvented heaters. Nevertheless, even if there were such concerns, today's rule will not require SY-124 to be used in the fuel used in unvented heaters. Furthermore, today's rule, does not require that SY-124 be added to kerosene. This resolves most of what concern might remain regarding this issue, since kerosene is the predominate fuel used in unvented heaters. However, the DoD stated that No. 2 diesel fuel is sometimes used in its tent heaters and expressed concern regarding the presence of SY-124 in fuel used for this purpose. We understand that to simplify the DoD fuel distribution system, it is DoD policy to use a single fuel called JP-8 for multiple purposes where practicable, including space heating. JP-8 used for such a purpose would not be subject to today's fuel marker requirement. In cases where JP-8 might not be available for space heating, DoD could avoid the use of SY-124 containing fuel by using kerosene in their space heaters.

We believe that the concerns expressed regarding the potential impact on distributors and transmix processors from the presence of SY-124 in heating oil and 500 ppm sulfur LM fuel have been addressed by moving the point of marker addition to the terminal. Terminal operators stated that they

desire the flexibility to blend 500 ppm diesel fuel from 15 ppm diesel fuel and heating oil. This practice would have been prevented by the proposed addition of the marker at the refinery gate. Under today's rule, terminal operators will have access to unmarked high sulfur fuel with which to manufacture 500 ppm diesel fuel by blending with 15 ppm diesel fuel.¹⁷⁹

Transmix processors stated that the presence of a marker in transmix would limit the available markets for their reprocessed distillates. The feed material for transmix processors primarily consists of the interface mixing zone between batches of fuels that abut each other during shipment by pipeline where this mixing zone can not be cut into either of the adjacent products. If marked heating oil and locomotive and marine fuel was shipped by pipeline, the source material for transmix processors fed by pipelines that carry marked fuel could contain SY-124.¹⁸⁰ Transmix processors stated that it would be prohibitively expensive to segregate pipeline-generated transmix containing the marker from that which does not contain the marker prior to processing, and that they could not economically remove the marker during reprocessing. Thus, in cases where the marker would be present in a transmix processor's feed material, they would be limited to marketing their reprocessed distillate fuels into the heating oil market. Since today's final rule requires that the marker be added at the terminal gate (rather than at the refinery gate), the feed material that transmix processors receive from pipelines will not contain the marker. Hence, they will not typically need to process transmix containing the fuel marker prescribed in today's rule, and today's marker requirement is not expected to significantly alter their operations. There is little opportunity for marker contamination of fuels that are not subject to the marker requirements to occur at the terminal and further downstream. In the rare instances where this might occur, the fuel contaminated would likely also be a distillate fuel, and thus could be sold into the heating oil market without need for reprocessing.

¹⁷⁹ Terminals that manufacture 500 ppm diesel fuel by blending 15 ppm and high sulfur fuel are treated as a refiner under today's rule. They must also comply with all applicable designate and track requirements, anti-downgrading provisions, and the other applicable requirements in today's rule (see section IV.D of today's preamble).

¹⁸⁰ We do not expect that there will be sufficient demand for 500 ppm sulfur LM diesel fuel produced by refiners or importers to justify its shipment by pipeline after 2010.

We do not expect that the fuel marker requirements will result in the need for additional fuel storage tanks or tank trucks in the distribution system. As discussed in section VI.A of today's preamble, the implementation of the NRLM sulfur standards in today's rule is projected to result in the need for additional storage tanks and tank truck de-manifolding at a limited number of bulk plant facilities. The marker requirement does not add another criteria apart from the sulfur content of the fuel which would force additional product segregation. As discussed above, industry has expressed concern about the use of the same tank trucks to alternately transport heating oil and jet fuel. We do not expect that the addition of marker to heating oil and 500 ppm sulfur LM diesel fuel will exacerbate these concerns. However, depending on the outcome of the aforementioned CRC program, the addition of marker to heating oil may hasten the current trend to avoid the use of tank trucks to alternately transport jet fuel and heating oil. To the extent that this does occur, we do not expect that it would result in substantial additional costs since few tank truck operators currently use the same tank truck compartments to alternately transport heating oil and jet fuel.

Through our discussions with the IRS, we have confirmed that the presence of SY-124 will not interfere with enforcement of their red dye requirement.¹⁸¹ Although, SY-124 may impart a slight orange tint to red-dyed diesel fuel, this will not complicate the identification of the presence of the IRS red dye. In fact, IRS has determined that the presence of SY-124 may even enhance enforcement of their fuel tax program.¹⁸² However, as identified in the comments, the implementation of today's marker requirement for heating oil arguably may be in conflict with IRS regulations at 26 CFR 48.4082-1(b) which state that no dye other than the IRS-specified red dye must be present in untaxed diesel fuel. IRS is evaluating what actions might be necessary to clarify that the addition of SY-124 to heating oil would not be in violation of IRS regulations.

IRS also related that they are investigating new markers for potential use either to supplement or to replace red dye under their diesel tax program which might be compatible with jet fuel. IRS stated that it might result in a reduced burden on industry if EPA were

¹⁸¹ Phone conversation between Carl Dalton and Rick Stiff, IRS and Jeff Herzog and Paul Machiele, EPA, February 19, 2004.

¹⁸² *ibid.*

to adopt one of the markers from the family of markers that they are investigating. Given the changes to our program in today's final rule, the marker provisions will not impose a significant burden. However, if the IRS program were to develop an alternate marker that would be compatible with jet we will initiate a rulemaking to evaluate the use of one of these markers in place of SY-124 (see section VIII.H.).

Commenters also expressed concerns regarding the proprietary rights related to the manufacture and use of SY-124, and stated that EPA should adopt a nonproprietary marker if possible. The proprietary rights related to SY-124 expire several months after the implementation of the marker requirements finalized in today's rule. Therefore, we do not expect that the current proprietary rights regarding SY-124 are a significant concern. Commenters also stated that our estimated cost of SY-124 in the NPRM (0.2 cents per gallon of treated fuel) was high compared to other markers that cost hundredths of a cent per gallon. Since the proposal we have obtained more accurate information which indicates that the current cost of bulk quantities of SY-124 is approximately 0.03 cents per gallon of treated fuel (see section VI.A.). Based on conversations with various marker manufacturers, this cost is comparable to or less than other fuel markers.

F. Fuel Marker Test Method

As discussed in section V.E above, today's rule requires the use of SY-124 at a concentration of 6mg/L in heating oil beginning in 2007, and in 500 ppm sulfur LM diesel fuel produced by a refiner or importer from 2010 through 2012, except for such fuels that used in the Northeast/Mid-Atlantic Area and Alaska. There is currently no industry standard test procedure to quantify the presence of SY-124 in distillate fuels. The most commonly accepted method is based on the chemical extraction of the SY-124 using hydrochloric acid solution and cyclohexane, and the subsequent evaluation of the extract using a visual spectrometer to determine the concentration of the marker.¹⁸³ This test is inexpensive and easy to use for field inspections. However, the test involves reagents that require some safety precautions and the small amount of fuel required in the test must be disposed of as hazardous waste. Commenters expressed concerns about

¹⁸³ Memorandum to the docket entitled "Use of a Visible Spectrometer Based Test Method in Detecting the Presence and Determining the Concentration of Solvent Yellow 124 in Diesel Fuel."

the use of a test procedure which involves a hazardous reagent (hydrochloric acid) and which generates a waste product that must be disposed of as hazardous waste. Nevertheless, we continue to believe that such safety concerns are manageable here in the U.S. just as they are in Europe and that the small amount of waste generated can be handled along with other similar waste generated by the company conducting the test, and that the associated effort and costs will be negligible.

Changes made in today's final rule from the proposal will mean that few parties in industry will need to test for the marker, thereby minimizing concerns about the burden of such testing. Much of the testing for the fuel marker that was envisioned by industry was associated with detecting marker contamination in other fuels. By moving the required point of marker addition downstream to the terminal, today's rule virtually eliminates these concerns. Where such concerns continue to exist, the presence of the red dye will provide a visual means of detecting marker contamination.¹⁸⁴ Therefore, we expect that the instances where parties will need to test for marker contamination will be rare. Also, the Northeast/Mid-Atlantic Area provisions finalized in today's rule will exempt the vast majority of heating oil used in the U.S. from the marker requirement. Based on the above discussion, we believe that the vast majority of testing for the presence of the fuel marker that will be conducted will be that by EPA for enforcement purposes.

Similar to the approach proposed regarding the measurement of fuel sulfur content discussed in section V.H above, we are finalizing a performance-based procedure to measure the concentration of SY-124 in distillate fuel. Section V.H above describes our rationale for finalizing performance-based test procedures. Under the performance-based approach, a given test method can be approved for use in a specific laboratory or for field testing by meeting certain precision and accuracy criteria. Properly selected precision and accuracy values allow multiple methods and multiple commercially available instruments to be approved, thus providing greater flexibility in method and instrument selection while also encouraging the development and use of better methods and instrumentation in the future. For example, we are hopeful that with more time and effort a simpler test can be

¹⁸⁴ Today's rule requires that red dye be present in heating oil which contains the marker.

developed for SY-124 that can avoid the use of reagents and the generation of hazardous waste that is by product of the current commonly accepted method.

Under the performance criteria approach, methods developed by consensus bodies as well as methods not yet approved by a consensus body will qualify for approval provided they meet the specified performance criteria as well as the record-keeping and reporting requirements for quality control purposes. There is no designated marker test method.

1. How Can a Given Marker Test Method Be Approved?

A marker test method can be approved for use under today's program by meeting certain precision and accuracy criteria. Approval will apply on a laboratory/facility-specific basis. If a company chooses to employ more than one laboratory for fuel marker testing purposes, then each laboratory will have to separately seek approval for each method it intends to use. Likewise, if a laboratory chooses to use more than one marker test method, then each method will have to be approved separately. Separate approval will not be necessary for individual operators or laboratory instruments within a given laboratory facility. The method will be approved for use by that laboratory as long as appropriate quality control procedures were followed.

In developing the precision and accuracy criteria for the sulfur test method, EPA drew upon the results of an inter-laboratory study conducted by the American Society for Testing and Materials (ASTM) to support ASTM's standardization of the sulfur test method. Unfortunately, there has not been sufficient time for industry to standardize the test procedure used to measure the concentration of SY-124 in distillate fuels or to conduct an inter-laboratory study regarding the variability of the method. Nevertheless, the European Union has been successful in implementing its marker requirement while relying on the marker test procedures which are currently available, as noted above. We used, the most commonly used marker test procedure to establish the precision and accuracy criteria on which a marker test procedure would be approved under the today's rule.¹⁸⁵

There has been substantial experience in the use of this reference market test method since the August 2002 effective

¹⁸⁵ Memorandum to the docket entitled "Use of a Visible Spectrometer Based Test Method in Detecting the Presence and Determining the Concentration of Solvent Yellow 124 in Diesel Fuel."

date of the European Union's marker requirement. However, EPA is aware of only limited summary data on the variability of the reference test method from a manufacturer of the visible spectrometer apparatus used in the testing.¹⁸⁶ The stated resolution of the test method from the materials provided by this equipment manufacturer is 0.1 mg/L, with a repeatability of plus or minus 0.08 mg/L and a reproducibility of plus or minus 0.2 mg/L.¹⁸⁷ Given the lack of more extensive data, we have decided to use these available data as the basis of the precision and accuracy criteria for the marker test procedure under today's rule (as discussed below). EPA may initiate a review of the precision and accuracy criteria finalized in today's rule should additional test data become available.

Using a similar methodology to that employed in deriving the sulfur test procedure precision value results in a precision value for the marker test procedure of 0.043 mg/L (see section V.H).¹⁸⁸ However, we are concerned that the use of this precision value, because it is based on very limited data, might preclude the acceptability of test procedures that would be adequate for the intended regulatory use. In addition, the lowest measurement of marker concentration that will have relevance under the regulations is 0.1 mg per liter. Consequently, today's rule requires that the precision of a marker test procedure will need to be less than 0.1 mg/L for it to qualify.

To demonstrate the accuracy of a given test method, a laboratory facility will be required to perform 10 repeat tests, the mean of which can not deviate from the Accepted Reference Value (ARV) of the standard by more than 0.05 mg/L. We believe that this accuracy level is not overly restrictive, while being sufficiently protective considering that the lowest marker level of

¹⁸⁶ Technical Data on Fuel/Dye/Marker & Color Analyzers, as downloaded from the Petroleum Analyzer Company L.P. Web site at http://www.petroleum-analyzer.com/product/PetroSpec/lit_pspec/DTcolor.pdf.

¹⁸⁷ Repeatability and reproducibility are terms related to test variability. ASTM defines repeatability as the difference between successive results obtained by the same operator with the same apparatus under constant operating conditions on identical test materials that would, in the long run, in the normal and correct operation of the test method be exceeded only in one case in 20. Reproducibility is defined by ASTM as the difference between two single and independent results obtained by different operators working in different laboratories on identical material that would, in the long run, be exceeded only in one case in twenty.

¹⁸⁸ See section V.H of this proposal for a discussion of the methodology used in deriving the proposed precision and accuracy values for the sulfur test method.

regulatory significance would be 0.1 mg/L. Ten tests will be required using each of two different marker standards, one in the range of 0.1 to 1 mg/L and the other in the range of 4 to 10 mg/L of SY-124. Therefore, a minimum of 20 total tests will be required for sufficient demonstration of accuracy for a given marker test method at a given laboratory facility. Finally, any known interferences for a given test method will have to be mitigated. These tests must be performed using commercially available SY-124 standards. Since the European Union's marker requirement will have been in effect for nearly 5 years by the implementation date of today's marker, we believe that such standards will be available by the implementation date for today's rule.

These requirements are not overly burdensome. To the contrary, these requirements are equivalent to what a laboratory would do during the normal start up procedure for a given test method. In addition, we believe the performance based approach finalized in today's rule will allow regulated entities to know that they are measuring fuel marker levels accurately and within reasonable site reproducibility limits.

2. What Information Would Have To Be Reported to the Agency?

As noted above, the European Union's (EU) marker requirement will have been in effect for nearly five years prior to the effective date for the proposed marker requirements and we expect the EU requirement to continue indefinitely. Thus, we anticipate that the European testing standards community will likely have standardized a test procedure to measure the concentration of SY-124 in distillate fuels prior to the implementation of the marker requirement in today's final rule. The United States testing standards community may also enact such a standardized test procedure. To the extent that marker test methods that have already been approved by a voluntary consensus standards body¹⁸⁹ (VCSB), such as the International Standards Organization (ISO) or the American Society for Testing and Materials (ASTM), each laboratory facility would be required to report to the Agency the precision and accuracy results as described above for each method for which it is seeking approval. Such submissions to EPA, as described elsewhere, will be subject to the Agency's review for 30 days, and the

¹⁸⁹ These are standard-setting organizations, like ASTM, and ISO that have broad representation of all interested stakeholders and make decisions by consensus.

method will be considered approved in the absence of EPA comment. Laboratory facilities are required to retain the fuel samples used for precision and accuracy demonstration for 30 days.

For test methods that have not been approved by a VCSB, full test method documentation, including a description of the technology/instrumentation that makes the method functional, as well as subsequent EPA approval of the method is also required. These submissions are subject to the Agency's review for 90 days, and the method will be considered approved in the absence of EPA comment. Submission of VCSB methods is not required since they are available in the public domain. In addition, industry and the Agency will likely have had substantial experience with such methods.

To assist the Agency in determining the performance of a given marker test method (non-VCSB methods, in particular), we reserve the right to send samples of commercially available fuel to laboratories for evaluation. Such samples are intended for situations in which the Agency has concerns regarding a test method and, in particular, its ability to measure the marker content of a random commercially available diesel fuel. Laboratory facilities are required to report the results from tests on this material to the Agency.

G. Requirements for Recordkeeping, Reporting, and PTDS

1. Registration Requirements

As discussed in section IV.D, by December 31, 2005, or six months prior to handling fuels subject to the designation requirements of today's rule, each entity in the fuel distribution system, up through and including the point where fuel is loaded onto trucks for distribution to retailers or wholesale purchaser-consumers, must register each of its facilities with EPA.

An entity's registration must include the following information:

- Corporate name and address
- Contact name, telephone number, and e-mail address
- For each facility operated by the entity:
 - Type of facility (e.g. refinery, import facility, pipeline, terminal)
 - Facility name
 - Physical location
 - Contact name, telephone number, and e-mail address

2. Applications for Small Refiner Status

An application of a refiner for small refiner status must be submitted to EPA

by December 31, 2004 and shall include the following information:

- The name and address of each location at which any employee of the company, including any parent companies, subsidiaries, or joint venture partners¹⁹⁰ worked from January 1, 2002 until January 1, 2003;
- The average number of employees at each location, based on the number of employees for each of the company's pay periods from January 1, 2002 until January 1, 2003;
- The type of business activities carried out at each location; and
- The total crude oil refining capacity of the corporation. We define total capacity as the sum of all individual refinery capacities for multiple-refinery companies, including any and all subsidiaries, and joint venture partners as reported to the Energy Information Administration (EIA) for 2002, or in the case of foreign refiners, a comparable reputable source, such as professional publication or trade journal.¹⁹¹ Refiners do not need to include crude oil capacity used in 2002 through a lease agreement with another refiner in which it has no ownership interest.

The crude oil capacity information reported to the EIA is presumed to be correct. However, in cases where a company disputes this information, we will allow 60 days after the company submits its application for small refiner status for that company to petition us with detailed data it believes shows that the EIA's data was in error. We will consider this data in making a final determination about the refiner's crude oil capacity.

Finally, applications for small refiner status must also include information on which small refiner option the refiner expects to use at each of its refineries.

3. Applications for Refiner Hardship Relief

As discussed above in section IV.C, a refiner seeking general hardship relief under today's program will apply to EPA and provide several types of financial and technical information, such as internal cash flow data and information on bank loans, bonds, and assets as well as detailed engineering and construction plans and permit status. Applications for general hardship relief are due June 1, 2005.

¹⁹⁰ "Subsidiary" here covers entities of which the parent company has 50 percent or greater ownership.

¹⁹¹ We will evaluate each foreign refiner's documentation of crude oil capacity on an individual basis.

4. Pre-Compliance Reports for Refiners

We believe that an early general understanding of the refining industry's progress in complying with the requirements in today's rule will be valuable to both the industry and EPA. As with the highway diesel program, we are requiring that each refiner and importer provide annual reports on the progress of compliance and plans for compliance for each of their refineries or import facilities. These pre-compliance reports are due June 1 of each year beginning in 2005 and continuing through 2011, or until the production of 15 ppm sulfur NR and LM diesel fuel commences, whichever is later.

EPA will maintain the confidentiality of information submitted in pre-compliance reports to the full extent authorized by law. We will report generalized summaries of this data following receipt of the pre-compliance reports. We recognize that plans may change for many refiners or importers as the compliance dates approach. Thus, submission of the reports will not impose an obligation to follow through on plans projected in the reports.

Pre-compliance reports can, at the discretion of the refiner/importer, be submitted in conjunction with the annual compliance reports discussed below and/or the pre-compliance and annual compliance reports required under the highway diesel program, as long as all of the information that is required in all reports is clearly provided. Based on experience with the first pre-compliance reports for the highway diesel program, we are clarifying the information request for the pre-compliance reports as shown below. This should provide responses in a more standardized format which will allow for better aggregation of the data, as well as eliminate reporting of unnecessary information.

Pre-compliance reports must include the following information:

- Any changes in the basic corporate or facility information since registration;
- Estimates of the average daily volumes (in gallons) of each sulfur grade of highway and NRLM diesel fuel produced (or imported) at each refinery (or facility). These volume estimates must be provided both for fuel produced from crude oil, as well as any fuel produced from other sources, and must be provided for the periods of June 1, 2010–December 31, 2010, calendar years 2011–13, January 1, 2014–May 31, 2014, and June 1, 2014–December 31, 2014;
- For entities expecting to participate in the credit program, estimates of

numbers of credits to be earned and/or used;

- Information on project schedule by known or projected completion date (by quarter) by the stage of the project. For example, following the five project phases described in EPA's June 2002 Highway Diesel Progress Review report (EPA420-R-02-016): (1) Strategic planning, (2) planning and front-end engineering, (3) detailed engineering and permitting, (4) procurement and construction, and (5) commissioning and startup.

- Basic information regarding the selected technology pathway for compliance (e.g., conventional hydrotreating vs other technologies, revamp vs grassroots, etc.);
- Whether capital commitments have been made or are projected to be made; and
- The pre-compliance reports in 2006 and later years must provide an update of the progress in each of these areas.

5. Compliance Reports for Refiners, Importers, and Distributors of Designated Diesel Fuel

a. Designate and Track Reporting Requirements

i. Quarterly Reports

From June 1, 2007 and through September 1, 2010, all entities who are required to maintain records must report the following information by facility to EPA on a quarterly basis:

- The total volume in gallons of each type of designated diesel fuel for which custody was transferred by the entity to any other entity, and the EPA entity and facility identification number(s), as applicable, of the transferee; and
- The total volume in gallons of each type of designated diesel fuel for which custody was received by the entity from any other entity and the EPA entity and facility identification number(s), as applicable, of the transferor.

If a facility receives fuel from another facility that does not have an EPA facility identification number then that batch of fuel must be designated and reported as (1) heating oil if it is marked, (2) highway diesel fuel if taxes have been assessed, (3) NRLM diesel fuel if the fuel is dyed but not marked.

Terminals must also report the results of all compliance calculations including the following:

- The total volumes received of each fuel designation required to be reported over the quarterly compliance period;
- The total volumes transferred of each fuel designation required to be reported over the quarterly compliance period;
- Beginning and ending inventories of each fuel designation required to be

reported over the quarterly compliance period;

- Calculations showing that the volume of highway diesel fuel distributed from the facility relative to the volume received did not increase since June 1, 2007; and
- Calculations showing that the volume of high sulfur NRLM diesel fuel did not increase by a greater proportion than the volume of heating oil over the quarterly compliance period (not applicable in the Northeast/Mid-Atlantic Area or Alaska).

The quarterly compliance periods and dates by which the reports are due for each period are as follows.

TABLE V.G-1. QUARTERLY COMPLIANCE PERIODS AND REPORTING DATES^a

Quarterly compliance period	Report due date
July 1 through September 30.	November 30.
October 1 through December 31.	February 28.
January 1 through March 31.	May 31.
April 1 through June 30	August 31.

Notes: ^aThe first quarterly reporting period will be from June 1, 2007 through September 30, 2007 and the last quarterly compliance period will be from April 1, 2010 through May 31, 2010.

ii. Annual Reports

Beginning June 1, 2007, all entities that are required to maintain records for batches of fuel must report by facility on an annual basis (due August 31) information on the total volumes received of each fuel designation as well as the results of all compliance calculations including the following:

- The total volumes transferred of each fuel designation;
- Beginning and ending inventories of each fuel designation;
- In Alaska, for diesel fuel designated as high sulfur NRLM delivered from June 1, 2007 through May 31, 2010 and for diesel fuel designated as 500 ppm sulfur NRLM delivered from June 1, 2010 through May 31, 2014, refiners must report all information required under their individual compliance plan, including the end-users to whom each batch of fuel was delivered and the total delivered to each end-user for the compliance period;
- Ending with the report due August 31, 2010, calculations showing that the volume of highway diesel fuel distributed from the facility relative to the volume received did not increase since June 1, 2007;

- Ending with the report due August 31, 2010, calculations showing that the volume of highway diesel fuel distributed from the facility relative to new volume received did not increase over the annual compliance period by more than two percent of the total volume of highway diesel fuel received;

- Ending with the report due August 31, 2010, calculations showing that the volume of high sulfur NRLM diesel fuel did not increase by a greater proportion than the volume of heating oil over the annual compliance period (not applicable in the Northeast/Mid-Atlantic Area or Alaska);

- Calculations showing that the volume of heating oil did not decrease over the annual compliance period, beginning June 1, 2010 (not applicable in the Northeast/Mid-Atlantic Area or Alaska); and

- From June 1, 2010 through August 1, 2012, calculations showing that the volume of 500 ppm sulfur NR diesel fuel did not increase by a greater proportion than the volume of 500 ppm sulfur LM diesel fuel over the annual compliance period (not applicable in the Northeast/Mid-Atlantic Area and Alaska).

b. Other Reporting Requirements

After the NRLM diesel fuel sulfur requirements begin on June 1, 2007, refiners and importers will be required to submit annual compliance reports for each refinery or import facility. If a refiner produces 15 ppm sulfur or 500 ppm sulfur fuel early under the credit provisions, its annual compliance reporting requirement will begin on June 1 following the beginning of the early fuel production. These reporting requirements will sunset after all flexibility provisions end (*i.e.*, after May 31, 2014). Annual compliance reports will be due on August 31.

A refiner's or importer's annual compliance report must include the following information for each of its facilities:

- Batch reports for each batch produced or imported providing information regarding volume, designation (*e.g.*, 500 highway), sulfur level and whether the fuel was dyed and/or marked. Each batch can only have one designation. Therefore, if a refiner ships 100 gallons of 500 ppm sulfur fuel in 2007 and wants to designate 50 gallons as highway 500 and 50 gallons as NR 500, the refiner must report two separate batches and there must be two PTDs—one for 50 gallons of highway 500 and one for 50 gallons of NR 500).

- Report on the generation, use, transfer and retirement of diesel sulfur

credits. Credit transfer information must include the identification of the number of credits obtained from, or transferred to, each entity. Reports must also show the credit balance at the start of the period, and the balance at the end of the period. NRLM or nonroad diesel sulfur credit information is required to be stated separately from highway diesel credit information since the two credit programs are treated separately.

- For a small refiner that elects to produce 15 ppm sulfur NRLM diesel fuel by June 1, 2006 and therefore is eligible for a limited relaxation in its interim small refiner gasoline sulfur standards, the annual reports must also include specific information on gasoline sulfur levels and progress toward highway and NRLM diesel fuel desulfurization.

6. PTDs

Refiners, importers, and other parties in the distribution system must provide information on commercial PTDs that identify diesel fuel distributed by use designation and sulfur content; *i.e.*, for use in or motor vehicles, nonroad equipment, locomotive and marine equipment, or nonroad, locomotive, and marine diesel equipment, as appropriate, and the sulfur standard to which the fuel is subject. The PTD must indicate whether the fuel is diesel fuel, heating oil, kerosene, exempt fuel, or other. It must further state whether it is No. 1 or No. 2, dyed or undyed, marked heating oil, marked LM fuel, or unmarked. The specific designations on PTDs will change during the course of the program. For example, the highway designation for 500 ppm sulfur fuel ends after 2010. Where a party delivers or receives a particular load of fuel that has a uniform sulfur content but that has two different designations, the parties must utilize two different PTDs. For example, if, in 2007 a refiner moves 1,000 gallons of 500 ppm sulfur diesel into a pipeline, and the refiner's designation is that half of that product is highway 500 and half is nonroad 500, the parties would utilize one PTD for 500 gallons of highway 500 ppm sulfur diesel fuel and another for 500 gallons of nonroad 500 diesel fuel.

As in other fuels programs, PTDs must accompany each transfer of either title or custody of fuel. However, only custody transfers are relevant to compliance with the designation and tracking requirements and the downgrade limitations, and transfers to retail outlets and wholesale purchaser-consumers of fuel by distributors below the truck rack are not covered by the designate and track scheme. Therefore, the PTDs for these non-designate and

track transfers are somewhat more straightforward.

We believe this additional information on commercial PTDs is necessary to maintain the integrity of the various grades of diesel fuel in the distribution system. Parties in the system will be better able to identify which type of fuel they are dealing with and more effectively ensure that they are meeting the requirements of today's program. This in turn will help to ensure that misfueling of sulfur sensitive engines does not occur and that the program results in the needed emission reductions.

Today's rule allows the use of product codes to convey the required information, except for transfers to truck carriers, retailers and wholesale purchaser-consumers. We believe that more explicit language on PTDs to these parties is necessary since employees of such parties are less likely to be aware of the meaning of product codes. PTDs will not be required for transfers of product into nonroad, locomotive, or marine equipment at retail outlets or wholesale purchaser-consumer facilities with the exception of mobile refuelers. Mobile refuelers are required to provide a separate PTD to their customers for each type of fuel (*e.g.*, 500 ppm sulfur NRLM diesel fuel, 15 ppm sulfur NRLM diesel fuel, or 15 ppm highway diesel fuel) that they dispense from tanker trucks or other vessels into motor vehicles, nonroad diesel engines or nonroad diesel engine equipment, for each instance when they refuel such equipment at a given location.¹⁹²

a. Kerosene and Other Distillates To Reduce Viscosity

To ensure that downstream parties can determine the sulfur level of kerosene or other distillates that may be distributed for use for blending into 15 ppm sulfur highway or NRLM diesel fuel, for example, to reduce viscosity in cold weather, we are requiring that PTDs identify distillates specifically distributed for such use as meeting the 15 ppm sulfur standard.

b. Exported Fuel

Consistent with other EPA fuel programs, NRLM diesel fuel exported from the U.S. is not required to meet the sulfur standards of today's regulations. For example, where a refiner designates a batch of diesel fuel for export, and can demonstrate through commercial documents that the fuel was exported, such fuel would not be required to

¹⁹² Only one PTD is required for each fuel designation or classification regardless of the number of motor vehicles or the number of diesel-powered NRLM equipment that are fueled.

comply with the NRLM sulfur standards in today's rule. Product transfer documents accompanying the transfer of custody of the fuel at each point in the distribution system are required to state that the fuel is for export only and may not be used in the United States.

c. Additives

Today's rule requires that PTDs for additives for use in NRLM diesel fuel state whether the additive complies with the 15 ppm sulfur standard. Like the highway diesel rule, this program allows the sale of additives, for use by fuel terminals or other parties in the diesel fuel distribution system, that have a sulfur content greater than 15 ppm under specified conditions.

For additives that have a sulfur content less than 15 ppm, the PTD must state: "The sulfur content of this additive does not exceed 15 ppm." For additives that have a sulfur content greater than 15 ppm, the additive manufacturer's PTD, and PTDs accompanying all subsequent transfers, must provide a warning that the additive's sulfur content exceeds 15 ppm; the maximum sulfur content of the additive; the maximum recommended concentration for use of the additive in diesel fuel (stated as gallon of additive per gallon of diesel fuel); and the increase in sulfur concentration of the fuel the additive will cause when used at the maximum recommended concentration.

Today's rule contains provisions for aftermarket additives sold to owner/operators for use in diesel powered nonroad equipment. These provisions are in response to concerns that additives designed for engines not requiring 15 ppm sulfur fuel, such as locomotive or marine engines, could accidentally be introduced into nonroad engines if they had no label stating appropriate use. Beginning June 1, 2010, aftermarket additives for use in nonroad equipment must be accompanied by information that states that the additive complies with the 15 ppm sulfur standard. We believe this information is necessary for end users to determine if an additive is appropriate for use.

7. Recordkeeping Requirements for Refiners and Importers

Refiners and importers of distillate fuel must maintain the following designate and track records for the distillate fuel they produce and/or import. The specific types of distillate fuel that are subject to these recordkeeping requirements are

described below for the various periods of the program.¹⁹³

- Batch number (including whether it is an incoming or out-going batch for refineries that also handle previously designated fuel);

- Batch designation;
- Volume in gallons;
- Date/time of day of custody transfer; and

- Name and EPA entity and facility identification number of the facility to which the batch was transferred.

For highway diesel fuel, the records must also identify whether the batch was received or delivered with or without taxes assessed. For NRLM diesel fuel, the records must also identify whether the batch was received or delivered with or without the IRS red dye. For heating oil, the records must indicate whether the batch was received or delivered with or without the fuel marker. From June 1, 2010, through May 31, 2012, the records for LM fuel batches must also indicate whether the batch was received or delivered with or without the fuel marker.

In addition to the designate and track records, refiners and importers must maintain the following records on the highway and NRLM diesel fuel that they produce and/or import:

- PTDs;
- Sampling and testing results for sulfur content (for highway and NRLM diesel fuel that is subject to either the 15 ppm or 500 ppm sulfur standards), as well as sampling and testing results that are part of a quality assurance program;
- Sampling and testing results for the cetane index or aromatics content, as well as sampling and testing results for additives;

- Records on credit generation, use, transfer, purchase, or termination, maintained separately for the highway and NRLM diesel fuel credit programs; and

- Records related to individual compliance plans, if applicable, and annual compliance calculations.

a. June 1, 2006 through May 31, 2007

Refiners and importers must maintain the records listed above for each batch of diesel fuel that they designate and transfer custody of during the time period from June 1, 2006 through May 31, 2007, with the following fuel types:

- No. 1 15 ppm sulfur highway diesel fuel;
- No. 2 15 ppm sulfur highway diesel fuel;

¹⁹³ Transmix processors and terminal operators acting as refiners that produce 500 ppm sulfur diesel fuel for sale into the locomotive and marine markets are also subject to the recordkeeping requirements.

- 15 ppm sulfur NRLM diesel fuel;
- No. 1 500 ppm sulfur highway diesel fuel;
- No. 2 500 ppm sulfur highway diesel fuel; or
- 500 ppm sulfur NRLM diesel fuel.

b. June 1, 2007 Through May 31, 2010

Refiners and importers must maintain the records listed above for each batch of distillate fuel that they designate and transfer custody of during the time period from June 1, 2007 through May 31, 2010 with the following fuel types:

- No. 1 15 ppm sulfur highway diesel fuel;
- No. 2 15 ppm sulfur highway diesel fuel;
- 15 ppm sulfur NRLM diesel fuel;
- No. 1 500 ppm sulfur highway diesel fuel;
- No. 2 500 ppm sulfur highway diesel fuel; or
- 500 ppm sulfur NRLM diesel fuel;
- High sulfur NRLM diesel fuel; or
- Heating oil.

c. June 1, 2010 Through May 31, 2012

Refiners and importers must maintain the records listed above for each batch of diesel fuel that they designate and transfer custody of during the time period from June 1, 2010 through May 31, 2012, with the following fuel types:

- 500 ppm sulfur NR diesel fuel;
- 500 ppm sulfur LM diesel fuel; or
- Heating oil.

d. June 1, 2012 Through May 31, 2014

Refiners and importers must maintain the records listed above for each batch of distillate fuel that they transfer custody of and designate during the time period from June 1, 2012 through May 31, 2014 with the following fuel types:

- 15 ppm sulfur highway or NRLM diesel fuel;
- 500 ppm sulfur NRLM diesel fuel; or
- Heating oil.

d. June 1, 2014 and Beyond

Refiners and importers must maintain the records listed above for each batch of heating oil that they transfer custody of and designate during the time period from June 1, 2014 and beyond.

8. Recordkeeping Requirements for Distributors

Distributors of distillate fuel must maintain the following designate and track records on a facility-specific basis for the distillate fuel they distribute. The specific distillate fuel designations that are subject to these recordkeeping requirements are described below for the various periods of the program.

- Batch number (including whether it is an incoming or out-going batch);
- Batch designation;
- Volume in gallons;
- Date/time of day of custody transfer;

• Name and EPA entity and facility identification number of the facility from which the fuel batch was received or to which the fuel batch was delivered;

- Beginning and ending inventory volumes on a quarterly basis; and
- Inventory adjustments.

For highway diesel fuel, the records must also identify whether the batch was received or delivered with or without taxes assessed. For NRLM diesel fuel, the records must also identify whether the batch was received or delivered with or without the IRS red dye. For heating oil, the records must indicate whether the batch was received or delivered with or without the fuel marker. From June 1, 2010, through October 1, 2012, the records must indicate whether LM fuel was received or delivered with or without the fuel marker.¹⁹⁴ In addition to these designate and track records, distributors will be required to maintain records related to their quarterly and annual compliance calculations as well as copies of all PTDs.

If a facility receives fuel from another facility that does not have an EPA facility identification number then that batch of fuel must be designated as (1) heating oil if it is marked, or from 2010 through 2012, LM diesel fuel if the fuel is dyed and marked and is not heating oil (2) highway diesel fuel if taxes have been assessed, and (3) NRLM diesel fuel if the fuel is dyed but not marked.

If a facility delivers fuel to other facilities and that fuel is either 500 ppm sulfur highway diesel fuel on which taxes have been assessed or 500 ppm sulfur NRLM, or LM diesel fuel into which red dye has been added pursuant to IRS requirements, then the facility does not need to maintain separate records for each of the other facilities to which it delivered fuel. Similarly, if a facility delivers batches of marked heating oil to other facilities, then it does not need to maintain separate records for each of the other facilities to which it delivered the marked heating oil. If a facility only receives marked heating oil (*i.e.*, it does not receive any unmarked heating oil), then it does not need to maintain any heating oil

records. Similarly, if a facility only receives highway diesel fuel on which taxes have been assessed or NRLM diesel fuel which has been dyed pursuant to IRS regulations (*i.e.*, it does not receive any untaxed highway diesel fuel or undyed NRLM diesel fuel), then it does not need to maintain records of the 500 ppm sulfur highway or NRLM diesel fuel that it receives.

a. June 1, 2006 Through May 31, 2007

Facilities that receive No. 2 15 ppm sulfur highway diesel fuel and distribute any No. 2 500 ppm sulfur highway diesel fuel, must maintain records for each batch of diesel fuel with the following designations that they receive or deliver during the time period from June 1, 2006 through May 31, 2007:

- No. 1 15 ppm sulfur highway diesel fuel;
- No. 2 15 ppm sulfur highway diesel fuel;
- No. 2 500 ppm sulfur highway diesel fuel; and
- 500 ppm sulfur NRLM diesel fuel.

b. June 1, 2007 Through May 31, 2010

All facilities must maintain records for each batch of diesel fuel or heating oil with the following designations for which they receive or transfer custody during the time period from June 1, 2007 through May 31, 2010:

- No. 1 15 ppm sulfur highway diesel fuel;
- No. 2 15 ppm sulfur highway diesel fuel;
- No. 1 500 ppm sulfur highway diesel fuel;
- No. 2 500 ppm sulfur highway diesel fuel;
- 500 ppm sulfur NRLM diesel fuel;
- 15 ppm sulfur NRLM diesel fuel;
- High sulfur NRLM diesel fuel; and
- Heating oil.

c. June 1, 2010 Through May 31, 2012

All facilities must maintain records for each batch of diesel fuel or heating oil with the following designations for which they receive or transfer custody during the time period from June 1, 2007 through May 31, 2012. This requirement does not apply to facilities located in the Northeast/Mid-Atlantic Area or Alaska.

- 500 ppm sulfur NR diesel fuel;
- 500 ppm sulfur LM diesel fuel; or
- Heating oil.

d. June 1, 2012 Through May 31, 2014

Facilities that receive unmarked fuel designated as heating oil, must maintain records for each batch of diesel fuel with the following designations that they receive or deliver during the time

period from June 1, 2012 through May 31, 2014. This requirement does not apply to facilities located in Alaska or the Northeast/Mid-Atlantic Area unless they deliver marked heating oil to facilities outside of these areas.

- 500 ppm sulfur NRLM diesel fuel; and
- Heating oil.

9. Recordkeeping Requirements for End-Users

Today's program also contains certain recordkeeping provisions for end-users. From June 1, 2007 through October 1, 2010, end-users that receive any batch of high sulfur NRLM in Alaska must maintain records of each batch of fuel received for use in NRLM equipment unless otherwise allowed by EPA. From June 1, 2010 through October 1, 2012, end-users that receive any batch of 500 ppm sulfur NR in Alaska must maintain records of each batch of fuel received for use in NR equipment unless otherwise allowed by EPA. In addition, from June 1, 2012 through October 1, 2014, end-users that receive any batch of 500 ppm sulfur NRLM in Alaska must maintain records of each batch of fuel received for use in NRLM equipment unless otherwise allowed by EPA.

10. Record Retention

We are adopting a retention period of five years for all records required to be kept under today's rule. This is the same period of time required in other fuels rules, and it coincides with the applicable statute of limitations. We believe that most parties in the distribution system would maintain some or all of these records for this length of time even without the requirement.

This retention period applies to PTDs, records required under the designate and track provisions, records of any test results performed by any regulated party for quality assurance purposes or otherwise (whether or not such testing was required by this rule), along with supporting documentation such as date of sampling and testing, batch number, tank number, and volume of product. Business records regarding actions taken in response to any violations discovered must also be maintained for five years.

All records that are required to be maintained by refiners or importers participating in the generation or use of credits, hardship options (or by importers of diesel fuel produced by a foreign refiner approved for the temporary compliance option or a hardship option), including small refiner options, are also covered by the retention period.

¹⁹⁴ After August 1, 2012, LM fuel distributed from terminals must contain a concentration of the marker no greater than 0.1 mg/L. After October 1, 2012, LM fuel at any location in the fuel distribution system must contain no more than a trace amount of the marker (0.1 mg/L).

H. Liability and Penalty Provisions for Noncompliance

1. General

The liability and penalty provisions of the today's NRLM diesel sulfur rule are very similar to the liability and penalty provisions found in the highway diesel sulfur rule, the gasoline sulfur rule, the reformulated gasoline rule and other EPA fuels regulations.¹⁹⁵ Regulated parties are subject to prohibitions which are typical in EPA fuels regulations, such as prohibitions on selling or distributing fuel that does not comply with the applicable standard, and causing others to commit prohibited acts. For example, liability will also arise under the NRLM diesel rule for violating certain prohibited acts and requirements, such as: Distributing or dispensing NR diesel fuel not meeting the 15 ppm sulfur standard for use in model year 2011 or later nonroad equipment (and after Dec 1, 2014 into any nonroad diesel equipment); distributing or dispensing diesel fuel not meeting the 500 ppm sulfur standard for locomotive and marine engines; distributing fuel containing the marker for use in engines that require the use of fuel that does not contain the marker; prohibitions and requirements under the designate and track provisions in today's rule, including specific prohibitions and requirements regarding fuel produced or distributed in the Northeast/Mid-Atlantic Area or in Alaska.¹⁹⁶

Small refiners and refiners using credits can produce high sulfur NRLM

¹⁹⁵ See section 80.5 (penalties for fuels violations); section 80.23 (liability for lead violations); section 80.28 (liability for gasoline volatility violations); section 80.30 (liability for highway diesel violations); section 80.79 (liability for violation of RFG prohibited acts); section 80.80 (penalties for RFG/CG violations); section 80.395 (liability for gasoline sulfur violations); section 80.405 (penalties for gasoline sulfur regulations); and section 80.610-614 (prohibited acts, liability for violations, and penalties for highway diesel sulfur regulations).

¹⁹⁶ Today's rule, in 40 CFR 80.610, provides that no person shall, inter alia, "dispense, supply, offer for supply, store or transport * * *" fuel not in compliance with applicable standards and requirements starting on a certain date. These prohibitions apply at downstream locations such as retail outlets, wholesale purchaser-consumer facilities as well as end-user locations. The act of storage or transport refers to storage or transport in fuel storage tanks from which fuel is dispensed into motor vehicles or NRLM engines or equipment. It does not refer to storing or transporting the fuel that is in the motor vehicle propulsion tank or other tank that is incorporated in the NRLM equipment for the purpose of supplying the engine with fuel. While the prohibition against dispensing inappropriate fuels does apply as of the applicable date, the motor vehicle or NRLM engine or equipment may continue to burn any fuel in the motor vehicle fuel tank or NRLM equipment fuel tank that was properly dispensed into such tank.

when NRLM would otherwise be required to meet a 500 ppm sulfur standard, and can produce 500 ppm sulfur NR or LM diesel fuel when nonroad or LM diesel fuel would otherwise be required to meet a 15 ppm sulfur standard. A refiner that produces fuel under the small refiner and credit provisions would be in violation unless they can demonstrate that they meet the definition of a small refiner or have sufficient credits for the volume of fuel produced. All regulated parties will be liable for a failure to meet certain requirements, such as the record-keeping, reporting, or PTD requirements, or causing others to fail to meet such requirements.

Under today's rule, the party in the diesel fuel distribution system that controls the facility where a violation occurred, and other parties in that fuel distribution system (such as the refiner, reseller, and distributor), will be presumed to be liable for the violation.¹⁹⁷ As in the Tier 2 gasoline sulfur rule and the highway diesel fuel rule, today's rule explicitly prohibits causing another person to commit a prohibited act or causing non-conforming diesel fuel to be in the distribution system. Non-conforming fuels include: (1) Diesel fuel with sulfur content above 15 ppm incorrectly represented as appropriate for model year 2011 or later nonroad equipment or other engines requiring 15 ppm fuel; (2) diesel fuel with sulfur content above 500 ppm incorrectly represented as appropriate for nonroad equipment or locomotives or marine engines after the applicable date for the 500 ppm sulfur standard for these pieces of equipment; (3) heating oil that is required to contain the marker which does not, LM fuel which is required to contain the marker which does not, or other fuels that are required to be free of the marker in which the marker is present; (4) fuel designated or labeled as 500 ppm sulfur highway diesel fuel above and beyond the volume balance limitations; (5) fuel designated or labeled as NRLM above and beyond the volume balance limitations; or (6) fuels otherwise not complying with the requirements of this rule. Parties outside the diesel fuel distribution system, such as diesel additive manufacturers and distributors, are also subject to liability for those diesel rule violations which could have been caused by their conduct.

Today's rule also provides affirmative defenses for each party presumed liable for a violation, and all presumptions of

¹⁹⁷ An additional type of liability, vicarious liability, is also imposed on branded refiners under today's rule.

liability are rebuttable. In general, in order to rebut the presumption of liability, parties will be required to establish that: (1) The party did not cause the violation; (2) PTD(s) exist which establish that the fuel or diesel additive was in compliance while under the party's control; and (3) the party conducted a quality assurance sampling and testing program. As part of their affirmative defense diesel fuel refiners or importers, diesel fuel additive manufacturers, and blenders of high sulfur additives into diesel fuel, will also be required to provide test results establishing the conformity of the product prior to leaving that party's control. Blenders of static dissipater additives have alternative defense provisions as discussed in section V.C. Branded refiners have additional affirmative defense elements to establish. The defenses under the nonroad diesel sulfur rule are similar to those available to parties for violations of the highway diesel sulfur, reformulated gasoline, gasoline volatility, and the gasoline sulfur regulations. Today's rule also clarifies that parent corporations are liable for violations of subsidiaries, in a manner consistent with the gasoline sulfur rule and the highway diesel sulfur rule. Finally, the NRLM diesel sulfur rule mirrors the gasoline sulfur rule and the highway diesel sulfur rule by clarifying that each partner to a joint venture will be jointly and severally liable for the violations at the joint venture facility or by the joint venture operation.

As is the case with the other EPA fuels regulations, today's rule will apply the provisions of section 211(d)(1) of the Clean Air Act (Act) for the collection of penalties. These penalty provisions currently subject any person that violates any requirement or prohibition of the diesel sulfur rule to a civil penalty of up to \$32,500 for every day of each such violation and the amount of economic benefit or savings resulting from the violation.¹⁹⁸ A violation of a NRLM diesel sulfur standard will constitute a separate day of violation for each day the diesel fuel giving rise to the violation remains in the fuel distribution system. Under today's regulation, the length of time the diesel fuel in question remains in the distribution system is deemed to be twenty-five days unless there is evidence that the fuel remained in its distribution system a lesser or greater amount of time. This is the same time presumption that is incorporated in the

¹⁹⁸ This limit is amended periodically pursuant to Congressional authority to change maximum civil penalties to account for inflation.

RFG, gasoline sulfur and highway diesel sulfur rules. The penalty provisions in today rule are also be similar to the penalty provisions for violations of these regulations.

EPA has included in today's rule two prohibitions for "causing" violations:

(1) Causing another to commit a violation; and (2) causing non-complying diesel fuel to be in the distribution system. These causation prohibitions are like similar prohibitions included in the gasoline sulfur and the highway diesel sulfur regulations, and, as discussed in the preamble to those rules, EPA believes they are consistent with EPA's implementation of prior motor vehicle fuel regulations. See the liability discussion in the preamble to the gasoline sulfur final rule, at 65 FR 6812 *et seq.*

The prohibition against causing another to commit a violation will apply where one party's violation is caused by the actions of another party. For example, EPA may conduct an inspection of a terminal and discover that the terminal is offering for sale nonroad diesel fuel designated as complying with the 15 ppm sulfur standard, while the fuel, in fact, had an actual sulfur content greater than the standard.¹⁹⁹ In this scenario, parties in the fuel distribution system, as well as parties in the distribution system of any diesel additive that had been blended into the fuel, will be presumed liable for causing the terminal to be in violation. Each party will have the right to present an affirmative defense to rebut this presumption.

The prohibition against causing non-compliant diesel fuel to be in the distribution system will apply, for example, if a refiner transfers non-compliant diesel fuel to a pipeline. This prohibition could encompass situations where evidence shows high sulfur diesel fuel was transferred from an upstream party in the distribution system, but EPA may not have test results to establish that parties downstream also violated a prohibited act with this fuel.

The Agency expects to enforce the liability scheme of the NRLM diesel sulfur rule in the same manner that we have enforced the similar liability schemes in our prior fuels regulations. As in other fuels programs, we will attempt to identify the party most responsible for causing the violation,

¹⁹⁹ At downstream locations the violation will occur if EPA's test result show a sulfur content of greater than 17 ppm, which takes into account the two ppm adjustment factor for testing reproducibility for downstream parties.

recognizing that party should primarily be liable for penalties for the violation.

2. What are the Liability Provisions for Additive Manufacturers and Distributors, and Parties That Blend Additives into Diesel Fuel?

a. General

The final highway diesel rule permits the blending of diesel fuel additives with sulfur content in excess of 15 ppm into 15 ppm highway diesel fuel under limited circumstances. As more fully discussed earlier in this preamble, this rule also permits downstream parties to blend fuel additives having a sulfur content exceeding 15 ppm into 15 ppm nonroad diesel, provided that: (1) The blending of the additive does not cause the diesel fuel's sulfur content to exceed the 15 ppm sulfur standard; (2) the additive is added in an amount no greater than one volume percent of the blended product; and (3) the downstream party obtained from its additive supplier a product transfer document ("PTD") with the additive's sulfur content and the recommended treatment rate, and that it complied with such treatment rate. As discussed in section V.C, today's rule includes alternate affirmative defense requirements for blenders of S-D additives that can contribute a maximum of 0.050 ppm to the sulfur content of finished fuel subject to the 15 ppm sulfur standard. Today's rule also implements these same alternate defense requirements regarding the blending of such additives into 15 ppm highway diesel fuel.

Since today's rule permits the limited use in nonroad diesel fuel of additives with high sulfur content, the Agency believes it might be more likely that a diesel fuel sulfur violation could be caused by the use of high sulfur additives. This could result from the additive manufacturer's misrepresentation or inaccurate statement of the additive's sulfur content or recommended treat rate on the additive's PTD, or an additive distributor's contamination of low sulfur additives with high sulfur additives during transportation. The increased probability that parties in the diesel additive distribution system could cause a violation of the sulfur standard warrants the imposition by the Agency of increased liability for such parties. Therefore, today's rule, like the final highway diesel rule, explicitly makes parties in the diesel additive distribution system liable for the sale of nonconforming diesel fuel additives, even if such additives have not yet been blended into diesel fuel. In addition,

today's rule imposes presumptive liability on parties in the additive distribution system if diesel fuel into which the additive has been blended is determined to have a sulfur level in excess of its permitted concentration. This presumptive liability will differ depending on whether the blended additive was designated as meeting the 15 ppm sulfur standard (a "15 ppm additive") or designated as a greater than 15 ppm sulfur additive (a "high sulfur additive"), as discussed below.

b. Liability When the Additive Is Designated as Complying with the 15 ppm Sulfur Standard

Additives blended into diesel fuel downstream of the refinery are required to have a sulfur content no greater than 15 ppm, and be accompanied by PTD(s) accurately identifying them as complying with the 15 ppm sulfur standard, with the sole exception of diesel additives blended into nonroad diesel fuel at a concentration no greater than one percent by volume of the blended fuel.

All parties in the fuel and additive distribution systems will be subject to presumptive liability if the blended fuel exceeds the sulfur standard. The two ppm downstream adjustment will apply when EPA tests the fuel subject to the 15 ppm sulfur standard. Low sulfur additives present a less significant threat to diesel fuel sulfur compliance than would occur with the use of additives designated as possibly exceeding 15 ppm sulfur. Thus, parties in the additive distribution system of the low sulfur additive could rebut the presumption of liability by showing the following: (1) Additive distributors will only be required to produce PTDs stating that the additive complies with the 15 ppm sulfur standard; (2) additive manufacturers are also be required to produce PTDs accurately indicating compliance with the regulatory requirements, as well as producing test results, or retained samples on which tests could be run, establishing the additive's compliance with the 15 ppm sulfur standard prior to leaving the manufacturer's control. Once they meet their defense to presumptive liability, these additive system parties will only be held responsible for the diesel fuel non-conformity in situations in which EPA can establish that the party actually caused the violation.

Under today's rule, parties in the diesel fuel distribution system will have the typical affirmative defenses of other fuels rules. For parties blending an additive into their diesel fuel, the requirement to maintain PTDs showing that the product complied with the

regulatory standards will necessarily include PTDs for the additive that was used, affirming the compliance of the additive and the fuel.

c. Liability When the Additive Is Designated as Having a Possible Sulfur Content Greater than 15 ppm

Under today's rule, a nonroad diesel fuel additive will be permitted to have a maximum sulfur content above 15 ppm if the blended fuel continues to meet the 15 ppm standard and the additive is used at a concentration no greater than one volume percent of the blended fuel. However, if nonroad diesel fuel containing that additive is found by EPA to have high sulfur content, then all the parties in both the additive and the fuel distribution chains will be presumed liable for causing the nonroad diesel fuel violation.

Since this type of high sulfur additive presents a much greater probability of causing diesel fuel non-compliance, parties in the additive's distribution system will have to satisfy an additional element to establish an affirmative defense. In addition to the elements of an affirmative defense described above, parties in the additive distribution system for such a high sulfur additive will also be required to establish that they did not cause the violation, an element of an affirmative defense that is typically required in EPA fuel programs to rebut presumptive liability.

Parties in the diesel fuel distribution system will essentially have to establish the same affirmative elements as in other fuels rules, with an addition comparable to the highway diesel rule. Blenders of high sulfur additives into 15 ppm sulfur nonroad diesel fuel, will have to establish a more rigorous quality control program than will exist without the addition of such a high sulfur additive. For additives other than static dissipater additives, to establish a defense to presumptive liability, the Agency has adopted the proposal to require test results establishing that the blended fuel was in compliance with the 15 ppm sulfur standard after being blended with the high sulfur additive. This additional defense element will be required as a safeguard to ensure nonroad diesel fuel compliance, since the blender has voluntarily chosen to use an additive which increases the risk of diesel fuel non-compliance.

An exception to this defense element is made for blenders of static dissipater additives, that are allowed by today's rule to contribute no more than 0.05 ppm to the sulfur content of a finished fuel subject to the 15 ppm sulfur standard. As discussed in section V.C.5, blenders of such additives may rely on

volume accounting reconciliation records in lieu of the requirement to sample and test each batch of fuel subject to the 15 ppm sulfur standard after the addition of an additive that exceeds the 15 ppm sulfur standard. Today's rule also implements these same alternate defense requirements regarding the blending of such additives into 15 ppm highway diesel fuel.

I. How Will Compliance With the Sulfur Standards Be Determined?

Today's rule provides that compliance with the sulfur standards and use requirements under today's rule can be determined by evaluating the designate and track records (discussed in section IV.D.) and other records, such as PTDs; by evaluating compliance with the fuel marker requirements discussed in section IV.D and V.E; and by sampling fuel and testing for sulfur content. Today's rule includes a requirement for refiners and importers to measure the sulfur content of every batch of NRLM fuel designated under the rule, using a testing methodology approved under the provisions discussed in section V.H of this preamble. In general, downstream parties must conduct only periodic sampling and testing as an element of a defense to presumptive liability (retailers are exempt from sampling and testing). Today's rule further provides that in determining compliance, any evidence from any source or location can be used to establish the diesel fuel sulfur level, provided that such evidence is relevant to whether the sulfur level would have met the applicable standard had compliance been determined using an approved test methodology. While the use of a non-approved test method might produce results relevant to determining sulfur content, this does not remove any liability for failing to conduct required batch testing using an approved test method. This is consistent with the approach taken under the gasoline sulfur rule and the highway diesel sulfur rule.

For example, the Agency might not have sulfur results derived from an approved test method for diesel fuel sold by a terminal, yet the terminal's own test results, based on testing using methods other than those approved under the regulations, could reliably show a violation of the sulfur standard. Under today's rule, evidence from the non-approved test method could be used to establish the diesel fuel's sulfur level that would have resulted if an approved test method had been conducted. This type of evidence is available for use by either the EPA or the regulated party, and could be used

to show either compliance or noncompliance. Similarly, absent the existence of sulfur test results using an approved method, commercial documents asserting the sulfur level of diesel fuel or additive could be used as some evidence of what the sulfur level of the fuel would be if the product would have been tested using an approved method.

The Agency believes that the same statutory authority for EPA to adopt the gasoline sulfur rule's evidentiary provisions, Clean Air Act section 211(c), provides appropriate authority for the evidentiary provisions of today's diesel sulfur rule. For a fuller explanation of this statutory authority, see the gasoline sulfur final rule preamble, 65 FR 6815, February 10, 2000.

VI. Program Costs and Benefits

In this section, we present the projected cost impacts and cost effectiveness of the nonroad Tier 4 emission standards and fuel sulfur requirements. We also present a benefit-cost analysis and an economic impact analysis. The benefit-cost analysis explores the net yearly economic benefits to society of the reduction in mobile source emissions likely to be achieved by this rulemaking. The economic impact analysis explores how the costs of the rule will likely be shared across the manufacturers and users of the engines, equipment and fuel that would be affected by the standards.

We revised our cost and benefit analysis to reflect the comments we received on our analysis. The fuel-related costs have been updated to reflect information received from refiners as part of EPA's highway diesel fuel program, comments received on the nonroad NPRM, as well as more recent information available on future energy costs and the cost of advanced desulfurization technologies. The engine and equipment-related costs were revised to reflect additional R&D costs associated with tailoring R&D to each particular engine line and to accommodate changes in the final emission control requirements, particularly with regard to engines above 750 hp. These costs are also now presented in 2002 instead of 2001 dollars. With regard to the benefits analysis, we have updated our methods consistent with Science Advisory Board (SAB) advice as specified in RIA chapter 9. Finally, we adjusted the economic impact analysis to reflect the revised cost inputs and to explicitly model the impacts on the locomotive and marine intermediate market sectors.

The results detailed below show that this rule would be highly beneficial to