Summary and Analysis of the 2007 Nonroad Diesel Fuel Pre-Compliance Reports

United States
Environmental Protection
Agency

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Compliance and Innovative Strategies Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

NOTICE

This technical report does not necessarily represent final EPA decisions or positions. It is intended to present technical analysis of issues using data that are currently available. The purpose in the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments.

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I. Executive Summary

Any refiner or importer planning to produce or import nonroad, locomotive, or marine (NRLM) diesel fuel containing 15 ppm sulfur or less after June 1, 2010 is required to submit to the U.S. Environmental Protection Agency ("EPA" or "the Agency") annual pre-compliance reports. Reports are due from 2005 through 2011 by June 1 of each year under the nonroad diesel sulfur regulations. This report summarizes the results of refiners' June 2007 pre-compliance reports.

Refiners' and importers' nonroad pre-compliance reports must contain estimates of total highway and NRLM 15 ppm diesel fuel and total highway and NRLM 500 ppm diesel fuel produced or imported from June 2010 through December 2014. For those refiners and importers planning on participating in the credit trading program, the reports must contain a projection of how many credits will be generated or used by each refinery or importer. The pre-compliance reports must also contain information outlining each refinery's timeline for complying with the 15 ppm sulfur standard and provide information regarding engineering plans (e.g., design and construction), and capital commitments for making the necessary modifications to produce 15 ppm NRLM diesel fuel.

The 2007 nonroad pre-compliance reports showed that:

- 122 refineries are planning to produce 15 ppm diesel fuel by June 1, 2014
- 18 refineries are either undecided as to their plans, or are choosing to produce only heating oil
- refiners have projected an increase in diesel fuel production from 2010 through 2014
- refiners are taking advantage of the flexibilities offered by the regulations (18 refineries said they generated early high sulfur credits in 2006 and 2007, 10 refineries plan to generate early 500 ppm credits in 2009 and 2010, small refiners are utilizing all of the options available to them)
- total highway and NRLM diesel fuel ("total diesel fuel") production and importation in each Petroleum Administration for Defense District (PADD) is projected to grow from 2010 through 2014
- refiners project an increase in expected production and importation of total diesel fuel beginning June 1, 2010, compared to the 2006 nonroad pre-compliance reports.

Many refiners have developed firmer plans to produce 15 ppm NRLM diesel fuel by June 1, 2010 than what they indicated in their 2006 pre-compliance reports, although these plans are still subject to change. EPA expects that next year's nonroad pre-compliance reports will contain more definite information on refiners' plans to produce 15 ppm NRLM diesel fuel by June 1, 2010.

II. Nonroad Diesel Program Overview

The Nonroad Diesel final rule (69 FR 38958, June 29, 2004) contains a two-step approach to reducing the sulfur content of nonroad, locomotive, and marine (NRLM) diesel fuel from uncontrolled levels down to 15 ppm. Beginning June 1, 2007, refiners and importers are required to produce or import NRLM diesel fuel with a maximum sulfur content of 500 ppm. Beginning June 1, 2010, refiners and importers are required to produce or import nonroad (NR) diesel fuel with a maximum sulfur content of 15 ppm. Beginning June 1, 2012, refiners and importers are required to produce or import locomotive and marine (LM) diesel fuel with a maximum sulfur content of 15 ppm.

This rule includes provisions for refiners and importers to generate credits for early NRLM diesel sulfur reduction efforts. "High sulfur" credits may be generated for early production of 500 ppm NRLM diesel fuel between June 1, 2006 and June 1, 2007. Similarly, "500 ppm" credits may be generated for early production of 15 ppm NRLM diesel fuel between June 1, 2009 and June 1, 2010. "High sulfur" credits could be used to comply with the 500 ppm NRLM standard beginning June 1, 2007, while "500 ppm" credits could be used to comply with the 15 ppm NR standard beginning June 1, 2010 and the 15 ppm LM standard that begins June 1, 2012. For both high sulfur credits and 500 ppm credits, one credit is equivalent to one gallon of diesel fuel that meets the respective standard earlier than required. In addition, "high sulfur" credits can be converted into "500 ppm" credits for use in 2010 and later. NRLM sulfur credits may be transferred nationwide. No credit trading area restrictions exist such as those found in the Highway Diesel rulemaking.

Small Refiner Flexibilities

Additional compliance flexibilities are provided for small refiners in the nonroad diesel sulfur regulations. The criteria for qualification as an NRLM small refiner are similar to those under the Tier 2/Gasoline Sulfur and Highway Diesel rules. To qualify as "small", a refiner must: 1) process NRLM diesel fuel from crude oil; 2) employ no more than 1,500 people corporate-wide, based on the average number of employees for all pay periods from January 1, 2002 to January 1, 2003; and, 3) have a corporate crude oil capacity less than or equal to 155,000 bpcd for 2002.

The small refiner relief options provide additional time for compliance and, for small refiners that choose to comply earlier than required with the NRLM requirements, the option of either generating diesel fuel sulfur credits or receiving a limited relaxation of their Tier 2/Gasoline Sulfur standards. These small refiner options are described in more detail below.

Option 1 – Delay 500 ppm NRLM production

This option allows approved small refiners to delay compliance with the NRLM diesel fuel sulfur standards as follows. Instead of a 500 ppm NRLM compliance date of June 1, 2007, small refiners have a compliance date of June 1, 2010. Production of high sulfur (greater than 500 ppm) NRLM diesel fuel from a small refiner's refinery between June 1, 2007 and June 1, 2010 is limited to 105 percent of the refinery's average NRLM diesel fuel production from 2003 through 2005.

Option 2 – Delay 15 ppm NRLM production

This option allows approved small refiners to delay compliance with the NRLM diesel fuel sulfur standards as follows. Instead of separate 15 ppm NR and LM compliance dates of June 1, 2010 and June 1, 2012, respectively, small refiners have a single 15 ppm NRLM compliance date of June 1, 2014. Production of 500 ppm sulfur NRLM diesel fuel from a small refiner's refinery between June 1, 2010 and June 1, 2014 is limited to 105 percent of the refinery's average NRLM diesel fuel production from 2006 through 2008.

Option 3 - NRLM Credit Option

An approved small refiner may choose to use the NRLM Credit Option in combination with the NRLM Delay Option. The NRLM Credit Option allows approved small refiners the opportunity to generate nonroad diesel sulfur credits for early production of compliant NRLM diesel fuel. These credits can be banked for future use or traded to another refiner. Small refiners could generate "High Sulfur" credits for producing any volume of 500 ppm NRLM diesel fuel prior to June 1, 2010. Small refiners could also generate "500 ppm" credits for producing any volume of 15 ppm NRLM diesel fuel between June 1, 2009 and June 1, 2014.

Option 4 - NRLM Diesel/Gasoline Compliance Option

This option is available to small refiners that produce greater than 95 percent of their NRLM diesel fuel at the 15 ppm sulfur standard by June 1, 2006 and elect not to use the NRLM Credit Option described above. Production of 15 ppm sulfur NRLM diesel fuel from a refinery using this option must be at least 85 percent of the refinery's 2003 through 2005 baseline NRLM production. Refiners choosing this option will receive a modest relaxation in their interim gasoline sulfur standards beginning January 1, 2004. Specifically, the applicable small refiner annual average and per-gallon cap would be increased by 20 percent for the duration of the interim program. The interim program is through 2010 if the refiner elected to extend the duration of its interim gasoline sulfur standards by producing 15 ppm highway diesel fuel by June 1, 2006, and through 2007 if the refiner did not produce 15 ppm highway

diesel fuel by June 1, 2006. However, in no case may the per-gallon gasoline sulfur cap exceed 450 ppm.

Other Flexibilities

Unlike the Highway Diesel rulemaking, the nonroad diesel sulfur regulations do not provide any specific flexibilities for refineries located in the Geographic Phase-in Area (GPA). Refiners located in the Rocky Mountain States (ID, MT, ND, WY, UT, CO and NM) must comply with the 500 ppm and 15 ppm NRLM sulfur standards within the compliance deadlines discussed above. NRLM diesel fuel in rural areas of the state of Alaska (a GPA state in the gasoline sulfur rulemaking) is exempt from the 500 ppm NRLM diesel fuel sulfur standard beginning June 1, 2007, but must meet the 15 ppm sulfur standard beginning June 1, 2010[1]. This fuel is regulated under a special rule for Alaska which was finalized in June 2006 (71 FR 32450, June 6, 2006).

Transmix processors distill off-specification interface mixtures of petroleum products from pipeline systems into gasoline and distillate fuel and are considered refiners by EPA. Their simple refinery configuration does not make it cost effective for them to install and operate a hydrotreater to reduce distillate fuel sulfur content. As a result, they have been provided with additional flexibility to comply with the diesel sulfur standards. Transmix processors may choose to continue to produce all of their highway diesel fuel to the 500 ppm sulfur standard until 2010. They may further choose to continue to produce all of their NRLM diesel fuel as high sulfur diesel fuel until June 1, 2010, all of their NRLM diesel fuel to meet the 500 ppm sulfur standard until June 1, 2014, and all of their LM diesel fuel to meet a 500 ppm sulfur limit indefinitely.

III. Nonroad Pre-Compliance Reporting Requirements

The Nonroad Rule requires that any refiner or importer planning to produce or import 15 ppm NRLM diesel fuel after June 1, 2010 must submit annual pre-compliance reports to EPA. The first pre-compliance report was due on June 1, 2005 and subsequent reports are due annually through 2011, or until the production of 15 ppm sulfur NR and LM diesel fuel commences, whichever is later.

The pre-compliance reports must contain the following information:

1. Any changes in the refiner's or importer's basic company or facility information since registration.
2. Estimates of the average daily volumes (gallons) of each sulfur grade of highway and NRLM diesel fuel produced or imported at each refinery

[1] Rural areas are defined as areas of Alaska not served by the federal aid highway system (FAHS)

(facility). The volume estimates must include both fuel produced from crude oil and other sources for the periods of June 1, 2010 through December 31, 2010, calendar years 2011-2013, January 1, 2014 through May 31, 2014, and June 1, 2014 through December 31, 2014.

3. For refiners or importers expecting to participate in the NRLM credit program, estimates of the number of credits generated and/or used during the periods above.
4. Information on project schedule by known or projected completion date (by quarter) for each stage of the project (strategic planning, front-end engineering, detailed engineering and permitting, procurement and construction, and commissioning and startup).
5. Basic information regarding the selected technology pathway for compliance (e.g. conventional hydrotreating versus other technologies, revamp versus grassroots, etc.).
6. Whether capital investments have been made or are projected to be made.
7. An update of the progress in each of these areas.

We recognize that the pre-compliance reports contain preliminary information and that final decisions on desulfurization plans may not have been made in all cases as of the reporting deadline. Accordingly, the information in this summary and analysis is based on the best available refinery information as of June 1, 2007. The information presented here will be updated with more current analyses as subsequent pre-compliance reports are received annually in 2008 through 2011.

IV. NRLM Summary Statistics

A. Nationwide Analysis

1. Refineries and Importers – Numbers and Volumes

According to the Energy Information Administration (EIA), 140 refineries reported producing either high or low sulfur (or both) distillate fuels in 2003. This reported production includes data from four refiner/importers that are located outside of the continental United States (in the U.S. Virgin Islands, Aruba, and Eastern Canada) whose production is targeted to the U.S. market. We received 2007 pre-compliance reports for 129 refineries, all of which produced high and/or low sulfur diesel fuel in 2003. The 11 refineries which did not send pre-compliance reports may be planning to produce high sulfur distillate fuel for the heating oil market, or may be planning to sell their high sulfur distillate fuel to other refineries that can desulfurize it.

Refiners indicated that, for most of their refineries, they have made decisions whether or not to produce 15 ppm NRLM diesel fuel. Table 1 shows that a total of 123 refineries reported they anticipate producing 15 and/or 500 ppm diesel fuel beginning June 1, 2010. The remaining 6 refineries that sent pre-compliance reports said they either

plan to produce only high sulfur distillate for the heating oil market, or are still deciding whether to produce 15 ppm NRLM diesel fuel.

Table 1.
U.S. Aggregated Report Information
Highway and NRLM Diesel Fuel Refinery Statistics 2010-2014

Year	2010	2011	2012	2013	2014a[2]	2014b
# refineries producing diesel fuel	123	123	124	123	123	122
# refineries at 100% 15 ppm	106	106	108	114	115	122
# refineries at 100% 500 ppm	5	5	3	2	2	0
# refineries with 15/500 ppm mix	12	12	13	7	6	0

The 2007 nonroad pre-compliance reports indicated that production of 15 ppm and 500 ppm total diesel fuel beginning June 1, 2010 is projected to be 4.42 million bbls/day, as shown in Table 2 below. The reported information does not allow for any distinction between highway and NRLM volume. However, from EIA's weekly supply estimates (http://tonto.eia.doe.gov/dnav/pet/pet_sum_sndw_dcus_nus_w.htm), production and importation of 15 ppm and 500 ppm diesel fuel for the first annual compliance period in the highway diesel program (June 1, 2006 through May 31, 2007) averaged approximately 3.4 million bbls/day. Thus, by comparing total production and importation from the 2007 reports with the average from the first annual compliance period, refiners appear to be planning to produce approximately 1.0 million bbls/day total additional 15 ppm and 500 ppm NRLM diesel fuel beginning June 1, 2010.

Table 2 and Figure 1 also illustrate that production of total 15 ppm diesel fuel is projected to increase by 230 thousand bbls/day from 2010 to 2014, to 4.55 million bbls/day. However, this projected increase is offset by a projected decrease in 500 ppm NRLM diesel fuel production of 105 thousand bbls/day from 2010 to 2014. Thirty thousand bbls/day of the projected decrease in 500 ppm production occurs by June 1, 2012 as some refiners begin producing 15 ppm sulfur LM diesel fuel. The remaining 500 ppm diesel fuel production ends by May 31, 2014, when the flexibilities for small refiners and NRLM credit use end.

Projected total production should be sufficient to meet future demand of 15 ppm and 500 ppm total diesel fuel. Total demand for 15 ppm and 500 ppm diesel fuel calculated from EIA's Annual Energy Outlook (AEO) 2007 is 4.11 million bbls/day in 2010 and 4.44 million bbls/day in 2015, compared to projected total production of 4.42 million bbls/day in 2010 and 4.55 million bbls/day in 2014[3].

[2] Data from the pre-compliance reports is divided into two sections for 2014 throughout this report. In all tables and figures, data for the first five months of 2014 is labeled 2014a, and data for the last seven months of 2014 is labeled 2014b.

[3] AEO 2007 projected a total distillate fuel oil demand of 4.53 million bbls/day in 2010 and 4.86 million bbls/day in 2015 (see Table A11 in http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html). Both of these totals include 425 thousand bbls/day distillate fuel oil (heating oil) for residential energy consumption (see Table

As mentioned previously, 140 refineries reported to EIA that they produced low and/or high sulfur distillate fuel in 2003. Eighteen of these refineries either reported that they have no plans at present to produce 15 ppm diesel fuel by June 1, 2014, or did not send an NRLM pre-compliance report to EPA in 2007. In 2003, these 18 refineries produced a total of 76 thousand bbls/day of diesel fuel containing less than 500 ppm sulfur, and 70 thousand bbls/day of distillate fuel containing more than 500 ppm sulfur. We cannot tell at this time if or when these refineries might choose to produce 15 ppm diesel fuel, or whether they will simply choose to continue to serve the heating oil market indefinitely.

Table 2.
U.S. Aggregated Report Information
Diesel Fuel Volume 2010-2014

Year	2010	2011	2012	2013	2014a	2014b
Total 15 ppm (highway + NRLM), bbls/day	4,323,553	4,348,778	4,431,146	4,500,089	4,503,560	4,552,242
Total 500 ppm NRLM, bbls/day	105,656	101,485	72,523	50,130	50,099	0
15 + 500 ppm total (highway + NRLM), bbls/day	4,429,209	4,450,263	4,503,668	4,550,219	4,553,659	4,552,242[4]

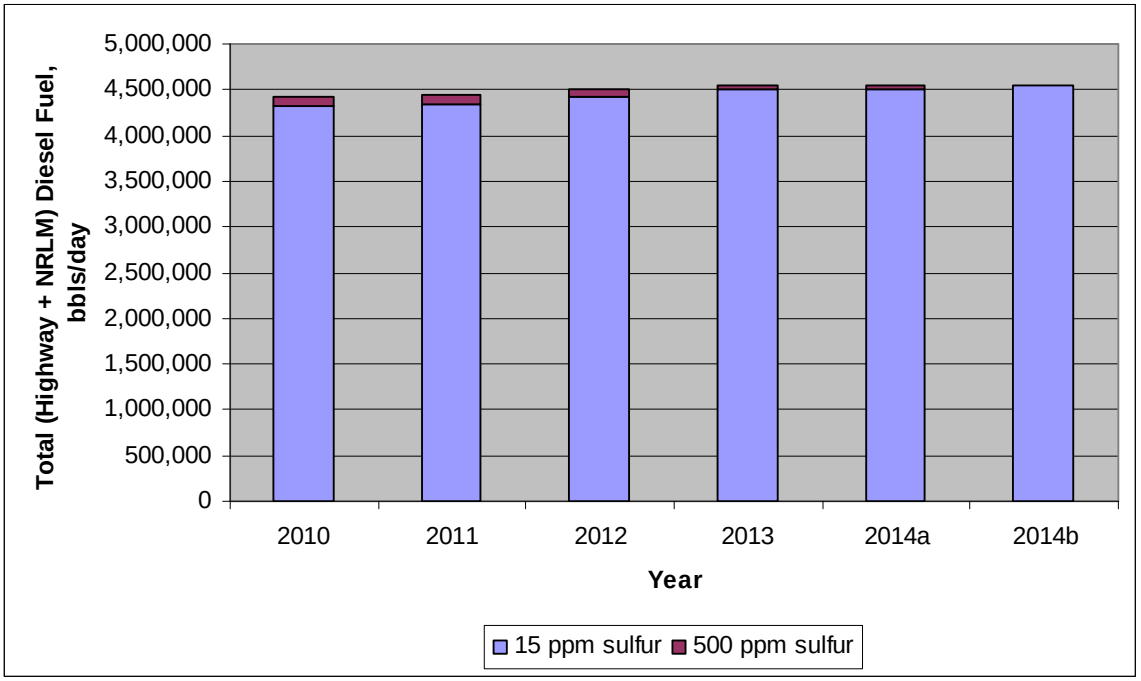


Figure 1. Projected (Highway + NRLM) Diesel Fuel Production by Type, 2010-2014

A2 at http://tonto.eia.doe.gov/dnav/pet/pet_sum_sndw_dcus_nus_w.htm). EPA does not require heating oil to meet either the 15 ppm or 500 ppm sulfur standard, so total demand for 15 ppm and 500 ppm diesel fuel can be calculated by subtracting heating oil demand from total distillate fuel oil demand.

[4] Total 15 + 500 ppm production decreases slightly during the last 7 months of 2014 because some refineries plan to shut down for maintenance during this time.

2. Projected Credit Generation and Use

Table 3 shows total reported nonroad diesel sulfur credits generated and used for each year of the nonroad diesel sulfur credit program. High sulfur credits are shown for the last 7 months of 2006 (refiners could not begin generating high sulfur NRLM credits until June 1, 2006), the full calendar years 2007 through 2009, and the first 5 months of 2010. 500 ppm credits are shown for the last 7 months of 2009, the full calendar years 2010 through 2013, and the first 5 months of 2014. Nineteen refineries indicated they plan to generate a total of 1,583 million high sulfur credits (1 credit = 1 gallon diesel fuel), mostly during the high sulfur early credit generation period from June 1, 2006 through May 31, 2007, including two refineries owned by small refiners who plan to continue generating high sulfur credits after May 31, 2007. Ten refineries indicated that they plan to use a total of 2,114 million high sulfur credits in 2007, including four refineries that plan to continue using high sulfur credits through May 31, 2010.

Nine refineries indicated they plan to generate a total of 1,177 million 500 ppm credits during the credit generation period from June 1, 2009 through May 31, 2010, including two refineries owned by small refiners who plan to continue generating 500 ppm credits through December 31, 2009. One refinery indicated that it plans to use a total of 40 million 500 ppm credits from June 1, 2010 through May 31, 2014.

Table 3.
U.S. Aggregated Report Information
Nonroad Diesel Fuel Credits 2006-2014

Year		**2006**	**2007**	**2008**	**2009**	**2010**	**total**
# refineries generating high sulfur credits		19	18	2	2	1	
# refineries using high sulfur credits			10	6	5	4	
High sulfur credit generation, millions		691	762	82	42	7	1,583
High sulfur credit usage, millions			573	691	675	176	2,114
Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**total**
# refineries generating 500 ppm credits	10	10	2	2	2		
# refineries using 500 ppm credits		1	1	1	1	1	
500 ppm credit generation, millions	519	419	79	79	82		1,177
500 ppm credit usage, millions		6	10	10	10	4	40

Figures 2 and 3 illustrate cumulative projected generation and usage of high sulfur credits and 500 ppm credits by year. Although Figure 3 shows that 500 ppm credit generation significantly exceeds 500 ppm credit usage, Figure 2 shows a projected shortfall in high sulfur credits beginning in 2009. EPA will have a clearer picture of high sulfur credit supply after we have analyzed the high sulfur credit generation and usage reports for the first annual compliance period (June 1, 2006 through May 31, 2007), submitted to EPA by August 31, 2007, since the pre-compliance reports indicated that most high sulfur credits would be generated during the first annual compliance period.

Additionally, we have talked with refiners who had indicated in their pre-compliance reports that they planned to use more high sulfur credits than they generated, and learned that they have flexibility to use fewer high sulfur credits, if necessary. Based on our conversations with these refiners, we believe they have sufficient flexibility to reduce their usage of high sulfur credits in order to match the available supply of high sulfur credits.

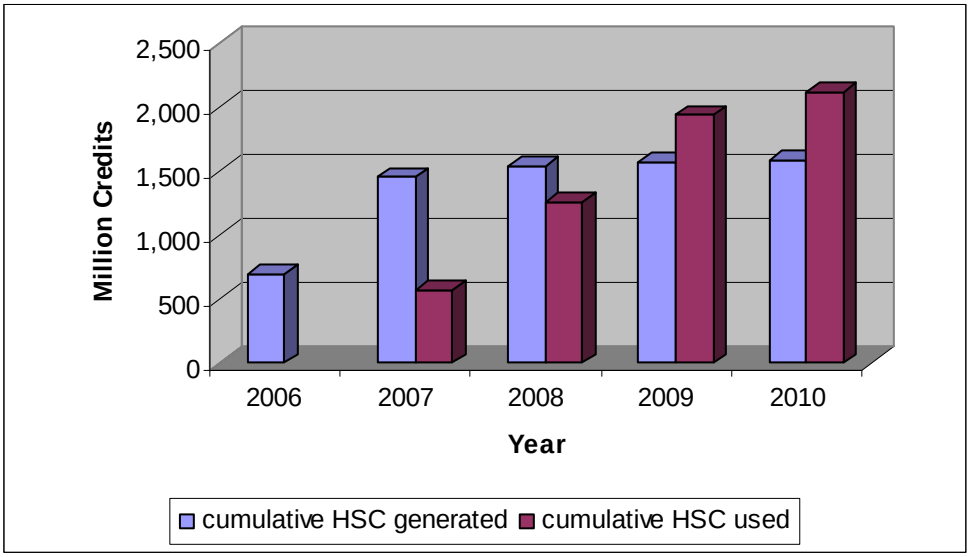


Figure 2. Total U.S. High Sulfur Credits

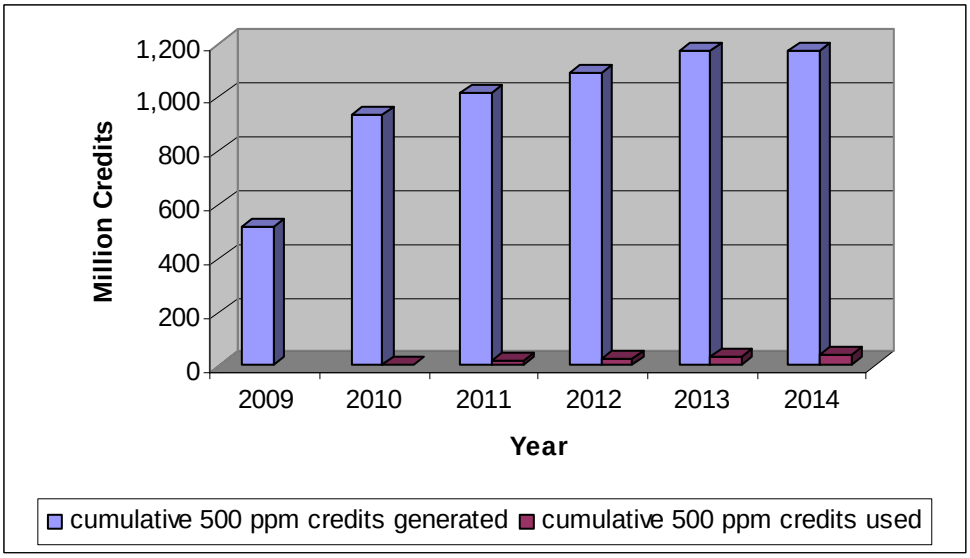


Figure 3. Total U.S. 500 ppm Credits

3. Project Scope and Timing

In addition to providing diesel fuel volume and credit projections, refineries must also include information outlining both their timeline for compliance with the 15 ppm sulfur standard and their engineering plans (e.g., design and construction) in their pre-compliance reports. We requested that refineries report their progress according to the following five stages: 1) strategic planning, 2) planning and front-end engineering, 3) detailed engineering and permitting, 4) procurement and construction, and 5) commissioning and start-up. In last year's nonroad pre-compliance reports, most refineries indicated they were either just starting to develop their plans to produce 15 ppm NRLM diesel, or did not plan to produce any more 15 or 500 ppm diesel than indicated in their highway pre-compliance reports.

In the 2007 NRLM pre-compliance reports, refiners indicated they have plans to install new desulfurization capacity at 29 refineries specifically to produce 15 ppm NRLM diesel fuel. All of these refineries are generally in the early stages of their projects to produce 15 ppm NRLM diesel fuel. Many have completed their strategic planning, are well into, or just beginning, their front-end engineering design work, and will soon be ordering, or have ordered, long lead time equipment like reactor vessels.

All 29 refineries indicated that they would either be revamping existing hydrotreating or hydrocracking units, or installing new hydrotreating or hydrocracking units. Twenty two of these refineries indicated specific project scopes to produce 15 ppm NRLM diesel. Of those 22 refineries, 9 are planning to install a new desulfurization unit, 9 are planning to revamp an existing desulfurization unit, and 4 refineries are planning to both install at least one new desulfurization unit and revamp at least one existing desulfurization unit. The other 7 refineries did not report detailed project information.

4. Small Refiner Options

As discussed in greater detail above, the Nonroad Diesel fuel regulations contain four options which provide qualified small refiners with flexibilities regarding production of 15 ppm NRLM diesel fuel. Option 1 allows a refinery owned by an approved small refiner to delay production of 500 ppm sulfur NRLM diesel fuel until June 1, 2010. Option 1 was chosen by 4 refineries. These 4 refineries produced eighteen thousand bbls/day high sulfur distillate fuel in 2003.

Option 2 allows a refinery owned by an approved small refiner to delay production of 15 ppm NRLM diesel fuel until June 1, 2014. Option 2 was chosen by 4 refineries. These 4 refineries produced eighteen thousand bbls/day high sulfur distillate fuel in 2003. (As Options 1 and 2 are not mutually exclusive, there are some small refiners that chose both Options 1 and 2.)

Option 3 allows a small refiner utilizing Option 1 to generate credits for any 500 ppm sulfur NRLM diesel fuel produced between June 1, 2006 and May 31, 2010, and/or

allows a small refiner utilizing Option 2 to generate credits for any 15 ppm sulfur NRLM diesel fuel produced between June 1, 2009 and December 31, 2013. Option 3 was chosen by 4 refineries. These 4 refineries produced six thousand bbls/day high sulfur distillate fuel in 2003.

Lastly, Option 4 allows a refinery owned by a small refiner the ability to increase its gasoline sulfur standards by 20 percent, provided that the refinery begins producing 15 ppm NRLM on June 1, 2006 and the refinery's 15 ppm NRLM production is at least 85 percent of the refinery's NRLM baseline production. Option 4 was chosen by 5 refineries. These 5 refineries produced fourteen thousand bbls/day high sulfur distillate fuel in 2003.

The volumes reported by refineries regarding the small refiner options, and the number of refineries by option chosen, are shown in Table 4 below.

Table 4.
Intended Small Refiner Compliance Options by Number of Refineries and High Sulfur Distillate Fuel Production Capacity

Option	Description	Number of Refineries	2003 High Sulfur Distillate Fuel Production (thousand bbls/day)
1.	Delay 500 ppm NRLM Production	4	18
2.	Delay 15 ppm NRLM Production	4	18
3.	NRLM Credit Option	4	6
4.	NRLM Diesel/Gasoline Compliance Option	5	14

B. PADD Analysis

This section presents information specific to each PADD. Tables 5 and 6 show, by PADD, the number of refineries producing 15 and/or 500 ppm diesel fuel for 2010 (from June 1 through December 31) and 2014 (from June 1 through December 31). The total number of refineries producing diesel fuel decreases by one from 2010 to 2014, as one refinery enters the diesel fuel market in 2012, and two refineries exit in 2012 and 2104 respectively. In 2010, 17 refineries are using flexibilities in the rules (producing 500 ppm LM diesel fuel, producing 500 ppm NR diesel fuel using NRLM credits, small refiner flexibilities) to produce some or all 500 ppm diesel fuel. However, by 2014 all but one of these refineries will be producing only 15 ppm diesel fuel.

Tables 7 and 8 show, by PADD, anticipated production rates of 15 ppm and 500 ppm total diesel fuel for 2010 (from June 1 through December 31) and 2014 (from June 1 through December 31), and Figure 4 illustrates the average anticipated production of 15

ppm and 500 ppm total diesel fuel by PADD from June 1, 2010 through December 31, 2014. Tables 7 and 8 show that from 2010 through 2014, the projected total diesel fuel production in PADDs 1, 3 and 5 increases by a total of 117 thousand bbls/day, while projected total diesel fuel production remains nearly constant in PADDs 2 and 4.

More detailed information for each PADD is shown below in Tables 9 through 13.

Table 5.
Projected Number of Highway and NRLM Diesel Fuel Refineries by PADD for 2010

PADD	1	2	3	4	5	Total U.S.
# refineries producing diesel fuel	14	25	44	14	26	123
# refineries at 100% 15 ppm	13	23	37	12	21	106
# refineries at 100% 500 ppm	0	1	3	0	1	5
# refineries with 15/500 ppm mix	1	1	4	2	4	12

Table 6.
Projected Number of Highway and NRLM Diesel Fuel Refineries by PADD for 2014b

PADD	1	2	3	4	5	Total U.S.
# refineries producing diesel fuel	15	25	43	14	25	122
# refineries at 100% 15 ppm	15	25	43	14	25	122
# refineries at 100% 500 ppm	0	0	0	0	0	0
# refineries with 15/500 ppm mix	0	0	0	0	0	0

Table 7.
Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2010

PADD	1	2	3	4	5	Total U.S.
Total 15 ppm (highway + NRLM), bbls/day	562,357	1,026,871	2,056,162	182,069	496,094	4,323,553
Total 500 ppm (highway + NRLM), bbls/day	267	6,207	81,355	6,500	11,326	105,656
15 + 500 ppm total (highway + NRLM), bbls/day	562,624	1,033,078	2,137,518	188,569	507,420	4,429,209

Table 8.
Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2014b

PADD	1	2	3	4	5	Total U.S.
Total 15 ppm (highway + NRLM), bbls/day	607,820	1,035,090	2,194,391	192,369	522,571	4,552,242
Total 500 ppm (highway + NRLM), bbls/day	0	0	0	0	0	0
15 + 500 ppm total (highway + NRLM), bbls/day	607,820	1,035,090	2,194,391	192,369	522,571	4,552,242

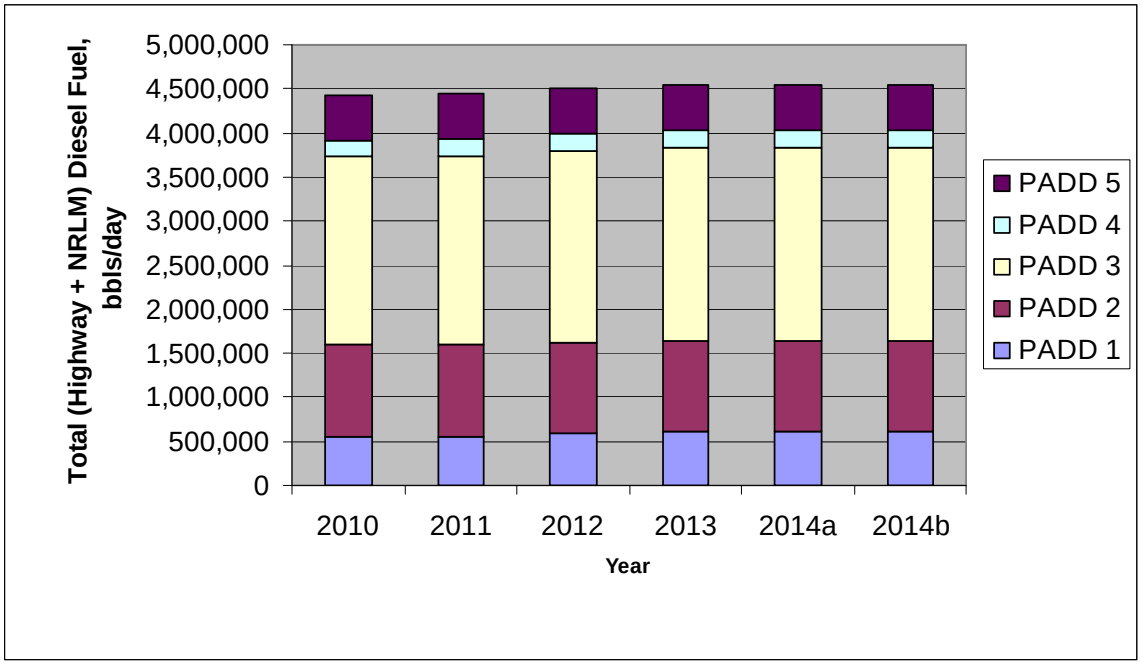


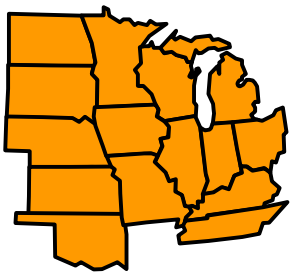
Figure 4. Projected (Highway + NRLM) Diesel Fuel Production by PADD, 2010-2014

1. PADD 1

Reported totals for all PADD 1 refineries and importers are summarized below in Table 9. Table 9 shows that for 2010, 14 refineries anticipate producing nearly 563 thousand bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel. Thirteen refineries reported that they intend to produce 100 percent of their diesel fuel at 15 ppm or less of sulfur, and one refinery reported they intend to produce a small amount of 500 ppm NRLM diesel fuel through May, 2014. Table 9 also shows that total diesel fuel production in PADD 1 is projected to increase by approximately 45 thousand bbls/day from 2010 through 2014, including one refinery that enters the diesel fuel market in 2012.

Table 9
PADD 1 Diesel Fuel Statistics 2010-2014

Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	14	14	15	15	15	15
# refineries at 100% 15 ppm	13	13	14	14	15	15
# refineries at 100% 500 ppm	0	0	0	0	0	0
# refineries with 15/500 ppm mix	1	1	1	1	0	0
Total 15 ppm (bbls/day)	562,357	562,600	587,290	607,938	607,426	607,820
Total 500 ppm (bbls/day)	267	424	228	98	0	0
Total 15 + 500 ppm (bbls/day)	562,624	563,024	587,518	608,035	607,426	607,820

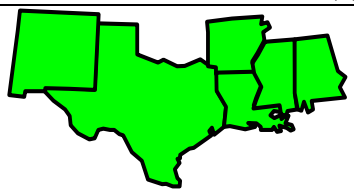


2. PADD 2

The reported totals for all PADD 2 refineries are summarized below in Table 10. Table 10 shows that for 2010, 25 refineries anticipate producing 1.03 million bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel. Twenty-three refineries reported that they intend to produce 100 percent of their diesel fuel at or below 15 ppm sulfur, and two refineries reported that they intend to produce a small amount of 500 ppm sulfur diesel fuel. Table 10 also shows that total diesel fuel production in PADD 2 is projected to remain essentially constant from 2010 through 2014.

Table 10.
PADD 2 Diesel Fuel Statistics 2010-2014

Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	25	25	25	25	25	25
# refineries at 100% 15 ppm	23	23	23	25	25	25
# refineries at 100% 500 ppm	1	1	0	0	0	0
# refineries with 15/500 ppm mix	1	1	2	0	0	0
Total 15 ppm (bbls/day)	1,026,871	1,035,923	1,034,731	1,037,875	1,038,896	1,035,090
Total 500 ppm (bbls/day)	6,207	5,921	2,595	0	0	0
Total 15 + 500 ppm (bbls/day)	1,033,078	1,041,844	1,037,326	1,037,875	1,038,896	1,035,090

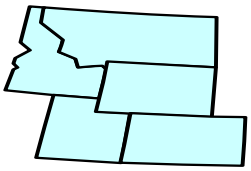


3. PADD 3

Reported totals for all PADD 3 refineries are summarized below in Table 11. Table 11 shows that 44 refineries anticipate producing nearly 2.14 million bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel in 2010. Thirty-seven refineries reported they intend to produce 100 percent of their diesel fuel at or below 15 ppm, and seven refineries reported that they intend to produce some amount of 500 ppm diesel fuel. Although one refinery currently plans to exit the diesel fuel market in 2014, total diesel fuel production is projected to increase by 57 thousand bbls/day from 2010 through 2014.

Table 11.
PADD 3 Diesel Fuel Statistics 2010-2014

Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	44	44	44	43	43	43
# refineries at 100% 15 ppm	37	37	37	40	40	43
# refineries at 100% 500 ppm	3	3	2	1	1	0
# refineries with 15/500 ppm mix	4	4	5	2	2	0
Total 15 ppm (bbls/day)	2,056,162	2,058,745	2,105,163	2,147,463	2,149,566	2,194,391
Total 500 ppm (bbls/day)	81,355	81,355	62,265	45,015	45,015	0
Total 15 + 500 ppm (bbls/day)	2,137,518	2,140,100	2,167,428	2,192,479	2,194,582	2,194,391

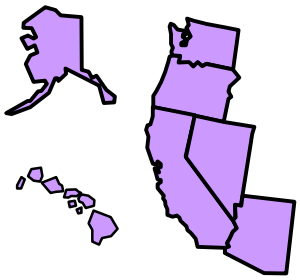


4. PADD 4

Reported totals for all PADD 4 refineries are summarized below in Table 12. Table 12 shows that 14 refineries anticipate producing nearly 189 thousand bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel in 2010. Twelve refineries reported that they intend to produce 100 percent of their diesel fuel with 15 ppm or less of sulfur and two refineries reported that they intend to produce some amount of 500 ppm diesel fuel. Table 12 also shows that the projected total diesel fuel production in PADD 4 remains relatively constant from 2010 through 2014.

Table 12.
PADD 4 Diesel Fuel Statistics 2010-2014

Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	14	14	14	14	14	14
# refineries at 100% 15 ppm	12	12	12	13	13	14
# refineries at 100% 500 ppm	0	0	0	0	0	0
# refineries with 15/500 ppm mix	2	2	2	1	1	0
Total 15 ppm (bbls/day)	182,069	184,271	189,722	192,571	192,858	192,369
Total 500 ppm (bbls/day)	6,500	6,500	2,982	500	500	0
Total 15 + 500 ppm (bbls/day)	188,569	190,771	192,704	193,071	193,358	192,369



5. PADD 5[5]

Reported totals for all refineries in PADD 5 are summarized below in Table 13. Table 13 shows that 26 refineries anticipate producing over 507 thousand bbls/day total (15 ppm and 500 ppm sulfur) diesel fuel in 2010. Twenty-one of these refineries indicated that they expect to produce 100 percent of their diesel fuel with 15 ppm sulfur or less, and five refineries reported that they intend to produce some amount of 500 ppm diesel fuel. Although one refinery plans to exit the diesel fuel market in 2014, total diesel fuel production is projected to increase by 15 thousand bbls/day from 2010 through 2014.

Table 13.
PADD 5 Diesel Fuel Statistics 2010-2014

Year	2010	2011	2012	2013	2014a	2014b
# refineries producing diesel fuel	26	26	26	26	26	25
# refineries at 100% 15 ppm	21	21	22	22	22	25
# refineries at 100% 500 ppm	1	1	1	1	1	0
# refineries with 15/500 ppm mix	4	4	3	3	3	0
Total 15 ppm (bbls/day)	496,094	507,238	514,240	514,241	514,814	522,571
Total 500 ppm (bbls/day)	11,326	7,284	4,452	4,517	4,583	0
Total 15 + 500 ppm (bbls/day)	507,420	514,523	518,692	518,758	519,397	522,571

[5] Alaska refineries are included in this analysis

C. Comparison of 2006 and 2007 NRLM Pre-Compliance Reports

Total production of 15 ppm and 500 ppm diesel fuel increased significantly in the 2007 NRLM pre-compliance reports, compared to the 2006 NRLM pre-compliance reports. Table 14 shows the projected volumes of 15 ppm and 500 ppm diesel fuel from the 2006 and 2007 NRLM pre-compliance reports for 2010 (in bbls/day, from June 1 to December 31). Total reported production of diesel fuel in 2007 was 280 thousand bbls/day greater than total reported production in the 2006 reports. Several refineries in each PADD reported increases in anticipated production, most significantly in PADDs 1, 2 and 3. This includes two refineries in PADD 1 and two refineries in PADD 3 which reported in 2006 that they were not planning to produce any 15 ppm diesel fuel beginning June 1, 2010, but are now planning to begin producing 15 ppm diesel fuel by June 1, 2010.

Table 14.
Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2010

PADD	1	2	3	4	5	Total U.S.
2006 NRLM reports						
Total 15 ppm, bbls/day	461,843	1,001,381	1,920,020	166,439	488,758	4,038,441
Total 500 ppm, bbls/day	71	9,936	78,920	14,054	7,548	110,529
Total (15 + 500) ppm , bbls/day	461,915	1,011,317	1,998,940	180,492	496,306	4,148,970
2007 NRLM reports						
Total 15 ppm, bbls/day	562,357	1,026,871	2,056,162	182,069	496,094	4,323,553
Total 500 ppm, bbls/day	267	6,207	81,355	6,500	11,326	105,656
Total (15 + 500) ppm , bbls/day	562,624	1,033,078	2,137,518	188,569	507,420	4,429,209
Increase in reported production, bbls/day	100,710	21,761	138,577	8,077	11,114	280,239

Table 15 shows the projected volumes of 15 and 500 ppm diesel fuel from the 2005 and 2006 NRLM pre-compliance reports for 2014 (from June 1 to December 31). Total reported production of diesel fuel in the 2007 reports was 262 thousand bbls/day greater than the total reported production in the 2006 reports. Several refineries in each PADD reported increases in anticipated production, most significantly in PADDs 1, 2 and 3.

Table 15. Projected Volumes of (Highway + NRLM) Diesel Fuel by PADD for 2014b						
PADD	**1**	**2**	**3**	**4**	**5**	**Total U.S.**
2006 NRLM reports						
Total 15 ppm, bbls/day	465,822	1,006,079	2,113,326	186,615	518,202	4,290,045
Total 500 ppm, bbls/day	0	0	0	0	0	0
Total (15 + 500) ppm , bbls/day	465,822	1,006,079	2,113,326	186,615	518,202	4,290,045
2007 NRLM reports						
Total 15 ppm, bbls/day	607,820	1,035,090	2,194,391	192,369	522,571	4,552,242
Total 500 ppm, bbls/day	0	0	0	0	0	0
Total (15 + 500) ppm , bbls/day	607,820	1,035,090	2,194,391	192,369	522,571	4,552,242
Increase in reported production, bbls/day	141,998	29,011	81,065	5,754	4,370	262,197

Appendix - List of Acronyms

bbls/day	*barrels per day*
bpcd	*barrels per calendar day*
EIA	*Energy Information Administration*
EPA (or, “the Agency”)	*U.S. Environmental Protection Agency*
FR	*Federal Register*
LM	*Locomotive and Marine*
NR	*Nonroad*
NRLM	*Nonroad, Locomotive, and Marine*
PADD	*Petroleum Administration for Defense District*
ppm	*parts-per-million*
ULSD	*Ultra Low Sulfur Diesel*