

# Summary and Analysis of the Highway Diesel Fuel 2004 Pre-Compliance Reports



**Summary and Analysis of the  
Highway Diesel Fuel  
2004 Pre-compliance Reports**

Assessment and Standards Division, Transportation and Regional Programs Division  
Office of Transportation and Air Quality  
Office of Air and Radiation  
U.S. Environmental Protection Agency

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The purpose in the release of such reports is to facilitate the exchange of technical information  
and to inform the public of technical developments which may form the basis for a final EPA  
decision, position, or regulatory action.*

## Executive Summary

Any refiner or importer planning to produce or import highway diesel fuel in 2006 through 2010, is required to submit to the U.S. Environmental Protection Agency (“EPA” or “the Agency”) pre-compliance reports by June 1 of each year. This report summarizes the results of the June 2004 pre-compliance reports. The first reports were due in June 2003; the final set of highway diesel reports will be due next June.

While individual refiners made a number of changes in their 2004 reports relative to their 2003 reports, on balance there was little overall change at both the nationwide and PADD level. The same general conclusions as in our 2003 summary report can be drawn this year. Specifically, the 2004 reports continue to indicate: 1) that refiners are on target for complying with the 15 ppm sulfur standard by June 2006, 2) that 15 ppm sulfur diesel fuel will be widely available nationwide with 95 percent of highway diesel fuel produced to the 15 ppm sulfur standard, and 3) that highway diesel fuel production will be sufficient to meet demand – refiners projected production exceeds the Department of Energy's Energy Information Administration's (EIA) projected demand. As shown in the report, planned total highway diesel fuel production appears to be in line with, or slightly above, projected demand. Hence, it appears that the refining industry as a whole is adequately planning for projected highway diesel demand through 2010.

The pre-compliance reports must contain estimates of the volumes of 15 parts-per-million (ppm) sulfur highway diesel fuel and 500 ppm sulfur highway diesel fuel that will be produced at each refinery or imported by each importer from June 2006 through May 2010. For those refineries planning to participate in the credit trading program, the reports must contain a projection of how many credits will be generated or used by each refinery. The pre-compliance reports must also contain information outlining each refinery's timeline for compliance with the 15 ppm sulfur standard and provide information regarding engineering plans (e.g., design and construction), the status of obtaining any necessary permits, and capital commitments for making the necessary modifications to produce 15 ppm sulfur highway diesel fuel. Similarly, for the new nonroad diesel rule, annual pre-compliance reports will be due on June 1 of each year beginning in 2005 and continuing through 2011.

This year, we received pre-compliance reports and/or information for all refineries that produced highway diesel fuel in the year 2003. Our conclusions here are based on the information provided in these reports which project data on fuel volumes, credit generation, and credit use plans as of June 1, 2004. The reports submitted for 2003 were projections that were based on more preliminary plans and several refiners changed their plans this year. While this year's pre-compliance reports may still reflect some preliminary information, as not all refineries have made final decisions on compliance plans at this point in time, we expect that most refinery plans are generally final or will be finalized in the very near future. Therefore, the 2004 pre-

## **Executive Summary**

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compliance reports should provide a more accurate prediction than the 2003 reports. Our summary and analysis of the pre-compliance reports for 2005 will be based on the pre-compliance reports that are submitted in 2005, and will therefore reflect updated information relative to the information that we received this year. However, given the status of most refiners, we expect fewer changes than occurred this year.

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## I. Pre-compliance Report Requirements

The 2007 highway diesel final rule (66 FR 5002, January 18, 2001) requires that any refiner or importer planning to produce or import highway diesel fuel in 2006 must submit annual pre-compliance reports to the Agency.<sup>a</sup> Reports were due on June 1, 2003 and June 1, 2004; the final highway diesel pre-compliance reports will be due on June 1, 2005. Similarly, pre-compliance reports will be due annually on June 1 for the new nonroad diesel final rule (69 FR 38958, June 29, 2004), with the first of these reports also being due on June 1, 2005.<sup>b</sup>

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 volumes of 15 parts-per-million (ppm) sulfur diesel fuel and 500 ppm sulfur (if applicable) diesel fuel to be produced from crude oil by each refinery and/or imported by each importer, as well as the volumes of each grade of highway diesel fuel produced from other sources.
3. Estimates of the numbers of credits to be generated and/or used, if at all.
4. Information regarding engineering plans (e.g., design and construction), the status of obtaining any necessary permits, and capital commitments for making the necessary modifications to produce ultra-low sulfur highway diesel fuel, and actual construction progress. Additionally, the reports summarized here, as well as the 2005 reports, are required to provide an update of the progress in each of these areas.

We recognize that the pre-compliance reports may still contain some preliminary information, as final decisions on desulfurization plans may not have been made in all cases as of the June 1 reporting deadline. Our conclusions from these reports are based on this preliminary information, and reflect some updated information from the 2003 pre-compliance reports.<sup>1</sup> Likewise, the Summary and Analysis of the Pre-compliance Reports for 2005 will be based on the pre-compliance reports that are submitted in 2005 and will reflect any new or updated information relative to the information that we received this year. While we expect that some information in this year's pre-compliance reports may still be somewhat preliminary, we do expect that the 2005 reports will contain finalized information for refiners plans for complying

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<sup>a</sup> The primary purpose of these reports is to help facilitate the market for credit trading under the highway diesel fuel program's temporary compliance option (TCO) which is described in the preamble to the 2007 highway diesel final rule at 66 FR 5065, January 18, 2001.

<sup>b</sup> The nonroad diesel fuel pre-compliance reports will be due beginning June 1, 2005, and will continue annually until June 1, 2011, or until the entity produces/imports nonroad (NR) or nonroad, locomotive, and marine (NRLM) diesel fuel meeting the 15 ppm sulfur standard.



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with the rule. Given the lead time remaining and the status of most refiners, we anticipate fewer changes in the 2005 reports than are reflected in the 2004 reports.

In addition to the information listed above that is required for all refiners, small refiners and Geographic Phase-in Area (GPA) refiners must provide additional information in their pre-compliance reports. For small refiners, the required information varies according to which small refiner option the refiner plans to use. The following paragraphs summarize the supplementary information required for small and GPA refiners.

### **Small Refiners**

In the highway diesel fuel regulations, a small refiner is defined as a refiner who 1) processes highway diesel fuel from crude oil; 2) employs no more than 1,500 people, based on the average number of employees for all pay periods for 1999; and, 3) has an average crude oil capacity less than or equal to 155,000 barrels per calendar day (bpcd).

The highway diesel final rule provided three alternative compliance options for refiners that qualify for small refiner status: 1) 500 ppm sulfur option, 2) small refiner credit option, and 3) diesel/gasoline compliance date option. A description of the additional reporting requirements for each of these options follows.

#### *500 ppm Sulfur Option*

The 500 ppm sulfur option allows an approved small refiner to continue to produce and sell highway diesel fuel meeting the 500 ppm sulfur standard through May 31, 2010, provided that the refiner supplies information showing that sufficient alternate sources of 15 ppm sulfur highway diesel fuel will exist in the marketing area(s) that the refiner serves.

The pre-compliance report for a small refiner planning to use this option must make a showing that sufficient sources of 15 ppm sulfur highway diesel fuel will likely exist in the area. If after 2004 the sources of 15 ppm sulfur highway diesel fuel decrease, the pre-compliance reports for 2005 must identify this change and must include a supplementary showing that the sources of 15 ppm sulfur highway diesel fuel are still sufficient.

#### *Small Refiner Credit Option*

Under the small refiner credit option, an approved small refiner that chooses to produce 15 ppm sulfur highway diesel fuel prior to June 1, 2010, may generate and sell credits under the TCO. Since small refiners have no requirement to produce 15 ppm sulfur highway diesel fuel prior to June 1, 2010, any fuel that they produce at or below the 15 ppm sulfur standard will qualify for credits under this option. (Additionally, the small refiner could then sell its remaining highway diesel fuel under the 500 ppm sulfur option described above.)

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## I. Pre-compliance Report Requirements

The pre-compliance reporting requirements for small refiners choosing this option are the same as those for the 500 ppm sulfur option (that is, if the small refiner is also producing 500 ppm sulfur highway diesel fuel), with the additional requirement that the refiner must also report on any credits it expects to generate and sell.

### *Diesel/Gasoline Compliance Date Option*

Under the diesel/gasoline compliance date option, approved small refiners that are also subject to the Tier 2/Gasoline Sulfur program (40 CFR Part 80, Subpart H) may extend the duration of their applicable interim gasoline sulfur standards by three years (until January 1, 2011), provided that all of the highway diesel fuel that they produce meets the 15 ppm sulfur standard as of June 1, 2006.

Pre-compliance reports from any small refiners expecting to use this option must provide information showing that diesel desulfurization plans are on track for compliance with the 15 ppm sulfur standard by June 1, 2006. In addition to the information required above for all refiners regarding the expansion of desulfurization capacity, the pre-compliance reports for small refiners expecting to use this option need to reasonably show that the refiner will be in a position by June 1, 2006 to produce 95<sup>c</sup> percent its highway diesel fuel at the 15 ppm sulfur standard. Further, the refiner must show that its total highway diesel fuel production will be at least 85 percent of its highway diesel fuel baseline volume.

### **GPA Refiners**

The GPA refiner option under the Tier 2/Gasoline Sulfur program, allows such refiners to extend the duration of their applicable interim gasoline sulfur standards by two years (until January 1, 2009), provided that they produce all of their highway diesel fuel at the 15 ppm sulfur standard beginning June 1, 2006.

Similar to the pre-compliance reports requirements for small refiners that choose to use the diesel/gasoline compliance date option described above, pre-compliance reports from refiners or importers expecting to use the GPA refiner option must provide information showing that their diesel desulfurization plans are on track. In addition to the information about the expansion of desulfurization capacity required above for all refiners, the pre-compliance reports for prospective GPA refiners need to reasonably show that the refiner will be in a position by June 1, 2006 to produce 95 percent of its highway diesel fuel that is compliant with the 15 ppm

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<sup>c</sup> In the nonroad diesel final rule, we changed the volume requirement (for small refiners and GPA refiners choosing the diesel/gasoline compliance option) from 100 percent to 95 percent to account for the change in volume determination from the point of production to the point of delivery. Consequently, refiners that were previously required to produce 100 percent of their highway diesel fuel to the 15 ppm sulfur standard are now provided with an allowance to deliver a small amount of 500 ppm sulfur diesel fuel to the next downstream party (e.g., pipeline).

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sulfur standard and that its total highway diesel fuel production will be at least 85 percent of its highway diesel fuel baseline volume.

## II. Summary Statistics

### A. Nationwide Analysis

According to the Energy Information Administration (EIA), 160 refineries reported producing either high or low sulfur distillate (or both) fuels in 2000. Of these distillate-producing refineries, 115 produced highway-compliant diesel fuel (less than or equal to 500 ppm sulfur) in the year 2003.<sup>d</sup> This number includes data for four refinery/importers that are located outside of the continental United States (i.e., in the U.S. Virgin Islands, Puerto Rico, and Eastern Canada) whose production is targeted to the U.S. market. We received pre-compliance reports or information for all of the 115 refineries that produced highway-compliant diesel fuel in 2003.

In addition to the reports that we received from current highway diesel fuel producers, we received reports from six refineries that plan to enter the market at some point before 2010. Of these six refineries, four will be entering the market in 2006, one in 2007, and the last will be entering the market in 2009.

The reported totals for all refineries and importers planning to produce highway diesel during and after the first year of the TCO (2006) are presented and summarized in Tables 1 and 2, below. These tables show that for 2006, 110 refineries reported that they intend to produce an estimated total volume of 2.8 million barrels per day (bbls/day)<sup>e</sup> of highway diesel fuel (15 ppm sulfur + 500 ppm sulfur). Over 2.6 million bbls/day, or 95 percent of the national total, is anticipated to be 15 ppm sulfur highway diesel fuel, with the remaining five percent meeting the 500 ppm sulfur highway diesel fuel standard. This projection is just slightly less than what was projected in the refinery pre-compliance reports for 2003. In last year's reports, it was anticipated that 111 refineries would produce 2.9 million bbls/day of total highway diesel fuel, with 96 percent of that fuel meeting the 15 ppm sulfur standard.

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<sup>d</sup> In our Summary and Analysis of the Highway Diesel Fuel 2003 Pre-compliance Reports, we reported 114 refineries producing highway diesel fuel in 2003. Subsequent to the publication of that report, we received a late pre-compliance report from an additional refinery that had been producing highway diesel fuel in 2003. In this report, the number of refineries for 2003 has been adjusted from 114 to 115 to reflect that late submission.

<sup>e</sup> Diesel fuel volume information was submitted in units of gallons per year pursuant to the pre-compliance reporting requirements under § 80.594. Since the compliance periods in 2006 and 2010 are not full years, we converted the reported values which were in units of gallons per year to equivalent barrels per calendar day to compare the aggregated volumes and credits on an equal basis from 2006 through 2010. Volumes and credits were converted from an annual basis to a daily basis by dividing by the number of days in each compliance period, and then converted from gallons to barrels by dividing by 42 gallons/barrel. The aggregated volumes and credits for 2006 were divided by 214 days (the 2006 compliance period is from June 1, 2006 through December 31, 2006), and the aggregated volumes and credits for 2010 were divided by 151 days (the 2010 compliance period is from January 1, 2010 through May 31, 2010).

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Over the duration of the TCO, refineries plan to generate approximately 1.7 million bbls/day of credits. They have plans to use over 264 thousand credits. The remainder of the credits would be available to respond to any unplanned compliance difficulties.

The following sections discuss this information in more detail.

### **1. Number of Refineries and Importers**

In the highway diesel final rule, we evaluated compliance costs for refiners to produce 15 ppm sulfur highway diesel fuel under two scenarios: 1) all current producers of highway diesel fuel continue to do so, and 2) some refineries increase production of highway diesel fuel while some refineries shift out of the highway diesel fuel market due to relatively high desulfurization costs. To be conservative, our cost projections for the highway diesel final rule were based on the first scenario. However, we also performed a sensitivity analysis based on the second scenario. Under this scenario, some refineries that currently produce relatively small volumes of highway diesel fuel would face relatively high costs per gallon to desulfurize a given volume of diesel fuel. At the same time, other refineries that currently produce no (or a relatively small volume of) highway diesel fuel could convert their diesel production from high sulfur (i.e., greater than 500 ppm sulfur) down to 15 ppm sulfur at a relatively low cost. Consequently, in our sensitivity analysis we projected that a number of refineries would shift into or significantly expand their presence in the highway diesel fuel market. The pre-compliance reports appear to be supporting this projection.

As shown in Table 1, below, 110 refineries reported that they intend to produce highway diesel fuel in 2006 (this is down one refinery from the 111 refineries that were projected in the 2003 pre-compliance reports). It is anticipated that four refineries will enter the highway diesel fuel market and nine will shift out of the highway diesel fuel market in 2006; for an overall decrease in the number of refineries, but an overall increase in volume, as shown in Table 2.

Of the nine refineries that anticipate shifting out of the market, one refinery reported that it intends to transport and desulfurize their fuel at another location. As such, its highway diesel production will not be lost from the market. An additional refinery, the Shell Bakersfield refinery, is being shut down due to declining crude oil supplies for the refinery.<sup>2</sup> Five refineries noted that they are studying options on whether or not to desulfurize their higher sulfur fuel to 15 ppm. The remaining two refineries did not state their intentions for desulfurization, though it is likely that these refineries will shift into the nonroad diesel fuel market.

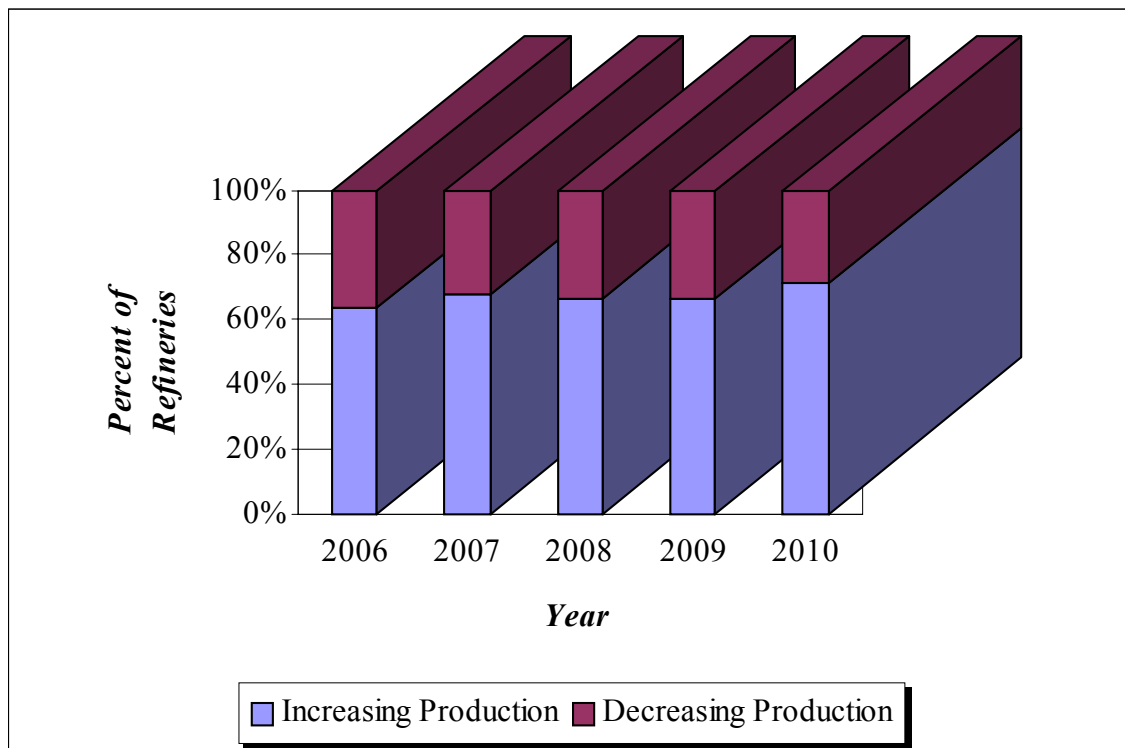
While some refineries may be shifting out of the highway diesel fuel market, others are planning to shift into the market. The pre-compliance reports project that some refineries will shift into the market during the TCO (four in 2006 and two more by 2010), resulting in a total of 114 refineries that will be producing highway diesel fuel in 2010. Though small refiners have

## II. Summary Statistics - Nationwide Analysis

the option to delay desulfurization until the year 2010, the reports indicate that currently only five refineries owned by small refiners plan to utilize this option.

Approximately two-thirds of the reporting refineries are planning to increase production of highway diesel fuel in 2006 compared to their 2000 production (based on EIA), and one-third of refineries are planning to decrease production.

<b>Table 1. U.S. Aggregated Report Information Highway Diesel Fuel Refinery Statistics 2006-2010</b>						
<b>Year</b>	<b>2003</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
# refineries producing highway diesel fuel	115	110	112	112	113	114
# refineries at 100% 15 ppm		87	89	88	91	97
# refineries at 100% 500 ppm	115	12	12	12	11	9
# refineries with 15/500 ppm mix		11	11	12	11	8
# refineries increasing production (vs. 2003)		76	81	80	80	86
# refineries shifting into the highway market		4	5	5	6	6
# refineries decreasing production (vs. 2003)		43	39	40	41	35
# refineries shifting out of the highway market		9	8	8	8	7
# refineries generating credits		57	58	58	60	
# refineries using credits		6	5	5	4	3



**Figure 1. Number of Refineries Increasing or Decreasing Production Relative to the Year 2003**

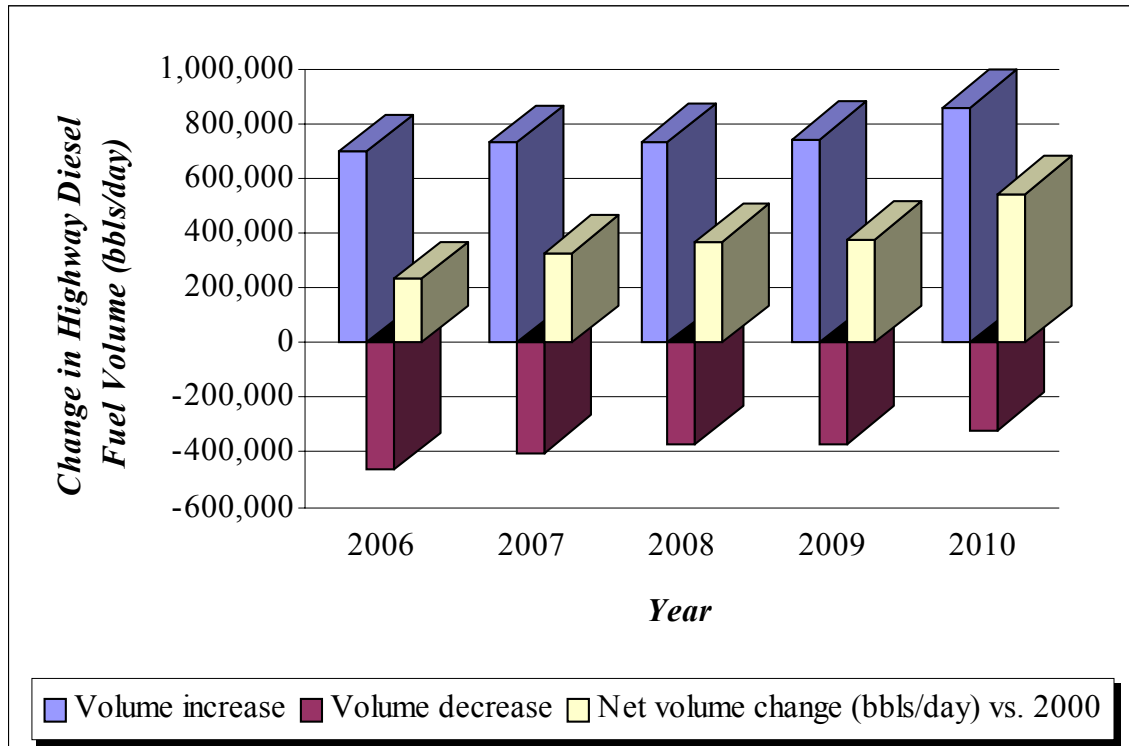
## 2. Production Versus Consumption

Table 2, below, shows the projected total production of highway diesel fuel for 2006 through 2010. The pre-compliance reports project that approximately 2.8 million bbls/day of highway diesel fuel will be produced in 2006. This volume increases to just over 3.0 million bbls/day for 2010. These volume projections are likely conservative given the fact that not all imported highway diesel fuel has been accounted for due to lack of reporting from spot market importers. We estimate that approximately two percent of the total highway diesel fuel supply is currently unaccounted for based on the pre-compliance information received to date.<sup>f</sup>

<sup>f</sup> In 2000, approximately 2.6 million bbls/day of highway-compliant (less than or equal to 500 ppm sulfur) diesel fuel were supplied in the U.S. Of that total supply, imports accounted for 134 thousand bbls/day or 5.2 percent. The refineries located outside of the U.S. from which we received pre-compliance reports produced approximately 76 thousand bbls/day, or 57 percent of the total volume of highway-compliant diesel fuel that was imported in 2000 and about three percent of the total volume of highway-compliant diesel fuel that was supplied in the U.S. in 2000. Therefore, approximately 43 percent of imports or two percent of the total supply of highway  
(continued...)

## II. Summary Statistics - Nationwide Analysis

For 2006, on a volume basis, the 76 refineries that anticipate increasing their production of highway diesel fuel reported a cumulative increase in their highway diesel fuel production volume of approximately 699 thousand bbls/day, and the 43 refineries planning to decrease production of highway diesel fuel reported a cumulative decrease in their highway diesel fuel production volume of over 466 thousand bbls/day. This results in a projected net increase of 233 thousand bbls/day of highway diesel fuel produced in 2006. As shown in Figure 2, this growth continues into the future, reaching a projected net increase of 544 thousand bbls/day in 2010.



**Figure 2. Nationwide Highway Diesel Fuel Volume Change vs. 2000**

<sup>f</sup>(...continued)

diesel fuel is currently unaccounted for based on the pre-compliance information received to date.



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<b>Table 2.</b>					
<b>U.S. Aggregated Report Information</b>					
<b>Highway Diesel Fuel Volume and Credits 2006-2010<sup>g</sup></b>					
<b>Year</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total 15 ppm, bbls/day	2,637,120	2,730,429	2,767,278	2,808,308	3,022,236
Total 500 ppm, bbls/day	140,928	144,764	146,604	113,780	67,311
Total 15 + 500 ppm, bbls/day	2,778,048	2,875,193	2,913,882	2,922,087	3,089,547
Net volume change vs. 2000 bbls/day	232,544	329,689	368,377	376,583	544,043
% change from 2000 highway volume	9.1	13.0	14.5	14.8	21.4
% 500 of total 15 + 500 ppm	5.1	5.0	5.0	3.9	2.2
Credit generation, bbls/day	415,245	420,006	424,627	433,476	
Credit usage, bbls/day	68,985	67,008	67,019	41,088	20,225

While the pre-compliance reports and this summary report are focused on projected highway diesel fuel production values, EIA's Annual Energy Outlook (AEO) reports projected energy consumption values by sector and source in quadrillion British Thermal Units (Btu) per year. In AEO 2004,<sup>3</sup> consumption values were projected for distillate fuel in the transportation sector for the years 2005 and 2010. We assumed a linear growth rate from 2005 until 2010 to estimate values for 2006 through 2009. We then converted these values to bbls/day by dividing by 138,700 Btu/gal<sup>4</sup> and 365 days per year. Results of this analysis are shown in Table 3, below. The resulting EIA-based consumption projections are compared against the pre-compliance report production projections in Table 3 and Figure 3, below. As shown below, planned total highway diesel fuel production appears to be in line with, or slightly above, projected demand. Hence, it appears that the refining industry as a whole is adequately planning for projected highway diesel demand through 2010.

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<sup>g</sup> The base year for the highway diesel fuel refinery statistics is 2003 as shown in Table 1, above. However, consistent with the Summary and Analysis of the Highway Diesel Fuel 2003 Pre-compliance Reports, the base year for the highway diesel fuel volume statistics is 2000, as shown in Table 2, above, because refinery distillate production data were not yet available to the Agency for calendar year 2003 at the time of publication of this report.

## II. Summary Statistics - Nationwide Analysis

Table 3. Projected Production of Highway Diesel Fuel vs. Estimated Demand		
Year	2004 Total Reported Production (000 bbls/day)	Estimated Demand 2004 AEO (000 bbls/day)
2000	2,560	
2006	2,778	2,711
2007	2,875	2,788
2008	2,914	2,864
2009	2,922	2,941
2010	3,090	3,017

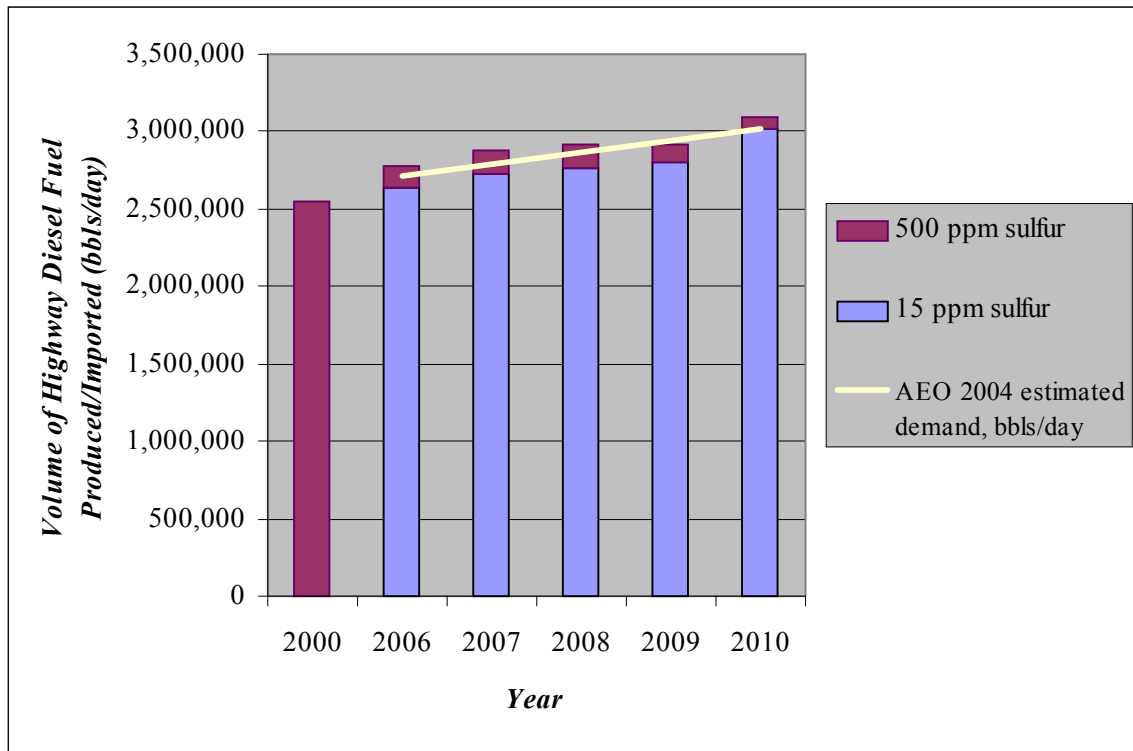


Figure 3. Projected U.S. Diesel Fuel Production and Demand, 2006-2010

### 3. Availability of 15 ppm sulfur Highway Diesel Fuel

The pre-compliance reports show that 15 ppm sulfur diesel fuel will be widely available. As shown in Figure 4, of the 110 refineries planning on producing highway diesel fuel in 2006, 87 refineries will be producing 100 percent 15 ppm highway diesel fuel. Another 11 plan to produce a mix of 15 and 500 ppm fuel, and three refineries will be using credits until May 31, 2010 to meet the standard. Only 12 are planning on producing exclusively 500 ppm fuel. Upon analyzing the data, we found that all 12 of these refineries are in markets where 15 ppm fuel will be readily available from other sources. As a result, they should not create any 15 ppm availability problems.

As shown in Figure 5, on a volume basis, it is anticipated that 95 percent of the volume of highway diesel fuel that will be produced in 2006 will meet the 15 ppm sulfur standard which is virtually identical to the volume predicted in the 2003 pre-compliance reports.

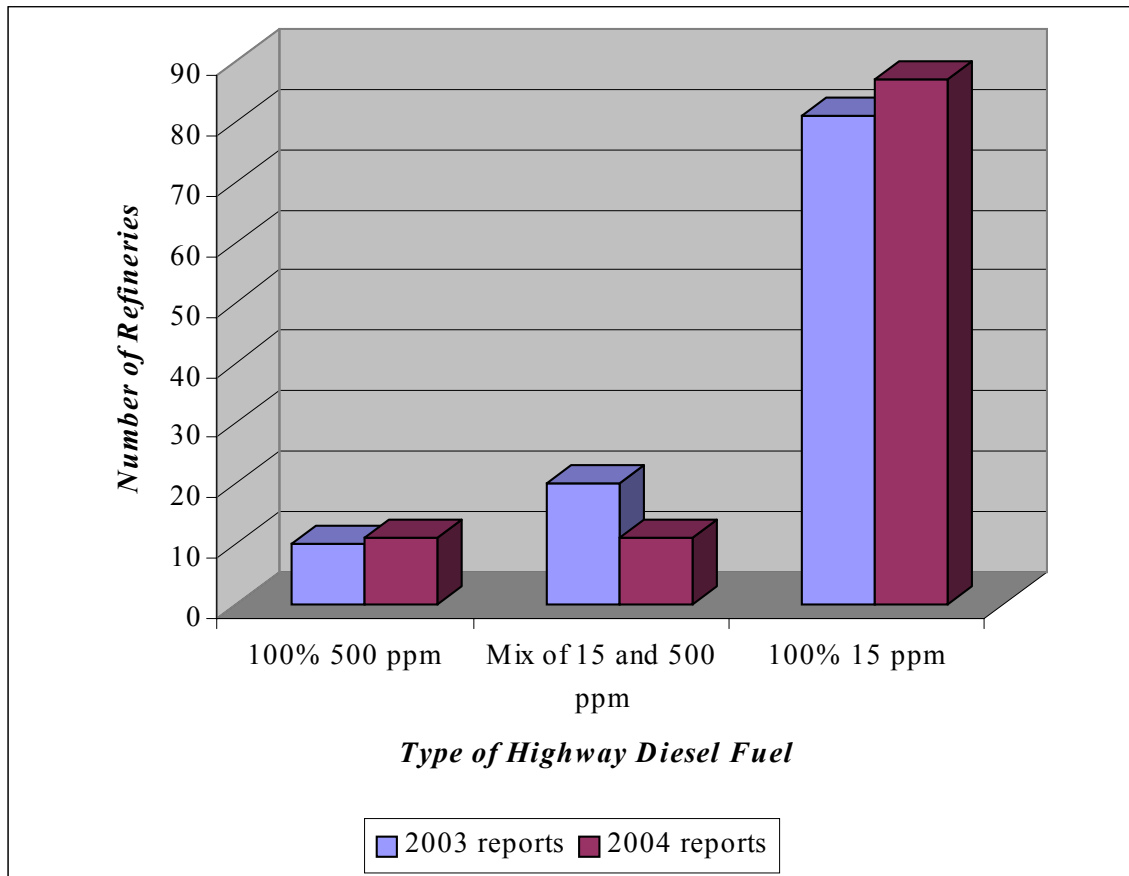
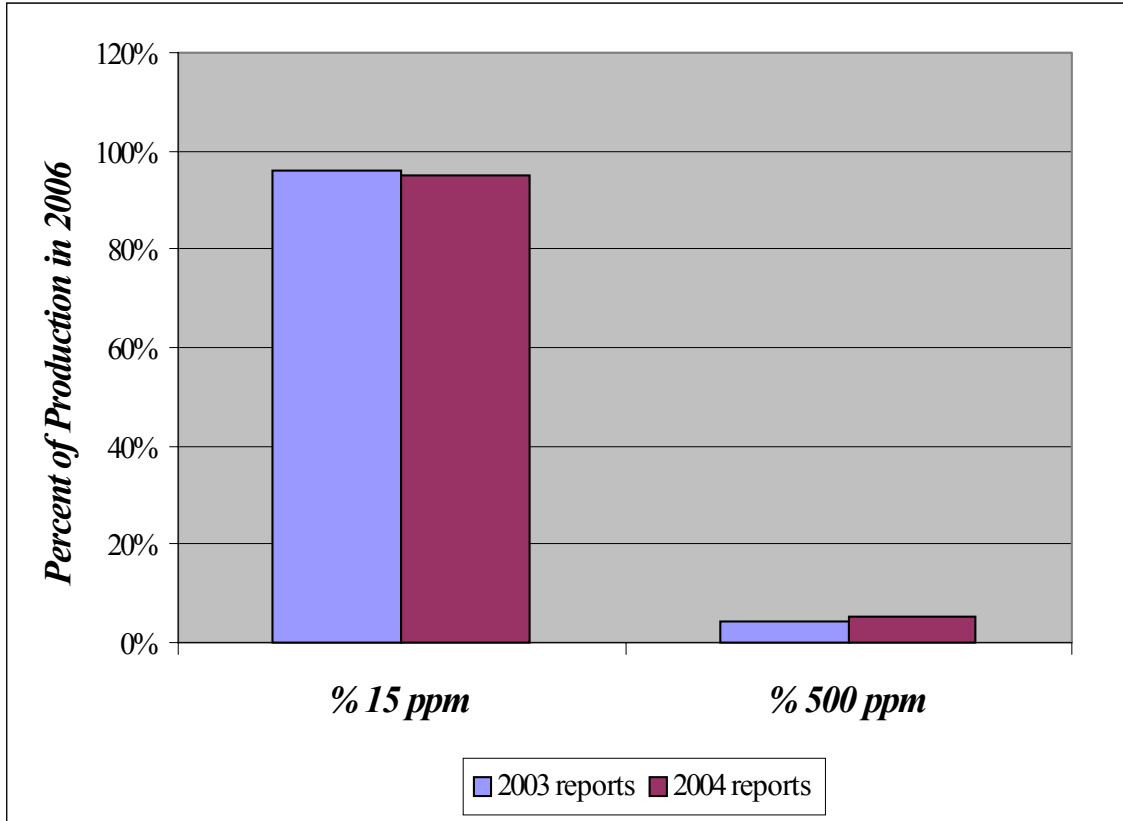


Figure 4. Number of Refineries Producing Highway Diesel Fuel in 2006

## II. Summary Statistics - Nationwide Analysis



**Figure 5. Highway Diesel Fuel Grades by Percent of Production Volume, 2006**

In the highway diesel final rule, we projected that 15 ppm sulfur highway diesel fuel would be available nationwide with 80 percent of the highway diesel fuel market converted to the 15 ppm sulfur level. With 95 percent of the market projected to be 15 ppm sulfur highway diesel fuel, we can have even greater confidence in the fuel's nationwide availability.

### **4. Projected Credit Generation and Use**

Given that the majority of highway diesel fuel is anticipated to meet the 15 ppm sulfur standard, a large credit volume is expected within each PADD, as shown in Table 4. This large credit volume will help to accommodate off-spec distillate material and will also provide a supply "safety valve" by allowing for an additional volume of 500 ppm sulfur highway diesel fuel without violating the TCO requirements. In 2006 a total credit generation of 415 thousand bbls/day is expected to be generated, while approximately 69 thousand bbls/day are expected to be used. The projected volume of credits used decreases to 20 thousand bbls/day by 2010. Over

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the course of the TCO, credit generation (1,693,354) continues to far exceed credit use (264,327).

<b>Table 4.</b>						
<b>Projected Volume of Credits (bbls/day)</b>						
<b>Generated and Used by PADD, 2006-2010</b>						
<i>Credits (bbls/day)</i>	<b>PADD 1</b>	<b>PADD 2</b>	<b>PADD 3</b>	<b>PADD 4</b>	<b>PADD 5</b>	<b>Total US</b>
Generated	211,353	429,101	959,731	22,455	70,716	1,693,354
Used	0	(27,617)	(216,483)	0	0	(264,327)
Net	211,353	401,484	743,246	22,455	70,716	1,429,029

At this point in time, it is too early to reach any definite conclusions regarding the extent to which refineries will use credits for compliance purposes or the extent to which they will make the credits that they generate available for purchase by other refineries. This information will become clearer with time as the program's implementation date becomes closer. However, from the reported data that we received, a total of six refineries anticipate that they will be using credits in 2006 to meet the standards. This number decreases to three refineries by 2010.

## II. Summary Statistics - Nationwide Analysis

### 5. Project Timing

In addition to providing highway 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. The 2003 pre-compliance reports indicated that most companies were in the planning stage and expected to make final decisions before the first quarter of 2004.

For this year's pre-compliance reports, we requested that refineries report more specific information to us on the status of their highway diesel fuel compliance plans. We provided refineries with the following five stages on which to report: 1) strategic planning, 2) planning and front-end engineering, 3) detailed engineering and permitting, 4) procurement and construction, and 5) commissioning and start-up. As this new reporting requirement was not requested until May (via the nonroad diesel final rule), not all refineries were able to report their data according to these five stages.

Of the 104 refineries that reported some information on their project timing, nearly 80 percent reported that they have completed the strategic planning stage, while the remaining few were still in this stage at the time of reporting.

As with the strategic planning stage, the majority of the refineries reported that they had either completed the planning and front-end engineering stage or would be doing so in the very near future (third or fourth quarter of 2004). Various reasons were reported for the remaining refineries that had not yet completed this stage, such as: no additional work would be needed at the refinery (already producing 15 ppm sulfur diesel fuel), the refinery will be importing 15 ppm sulfur diesel fuel, or the refinery will only be producing high sulfur (over 500 ppm) diesel fuel.

Of the refineries that reported information for the detailed engineering and permitting stage, roughly half are in the midst of this stage and will likely be finished by early 2005. For the 25 refineries that reported information on permits, most had submitted their permit applications at the time of reporting. Roughly half of these permits are pending approval. The remaining refineries reported that they had either received their approvals, or, in the case of four refineries, had not yet submitted their permit applications.

The majority of the refineries that reported procurement and construction dates projected that this stage would be complete by the first quarter of 2006. Some of these refineries reported that they would be done earlier in 2005 (and three refineries are already producing 15 ppm sulfur highway diesel fuel). A few refineries reported that they would be completing this stage after the June 2006 deadline, as they will either be using the Small Refiner Delay option or credits to comply.

Finally, with respect to the commissioning and start-up stage, Figure 6 shows projected

## Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004

start-up dates by quarter. Three refineries are already producing 15 ppm and another nine currently have operational desulfurization units that are capable of producing 15 ppm sulfur highway diesel fuel. Another 11 refineries anticipate having their desulfurization units up and running before January 2006. Figure 6 also shows the breakdown of these early refineries by PADD. As a result, in many places 15 ppm sulfur diesel fuel will be available early to prove out the distribution system, as well as supply fuel to retrofit fleets.

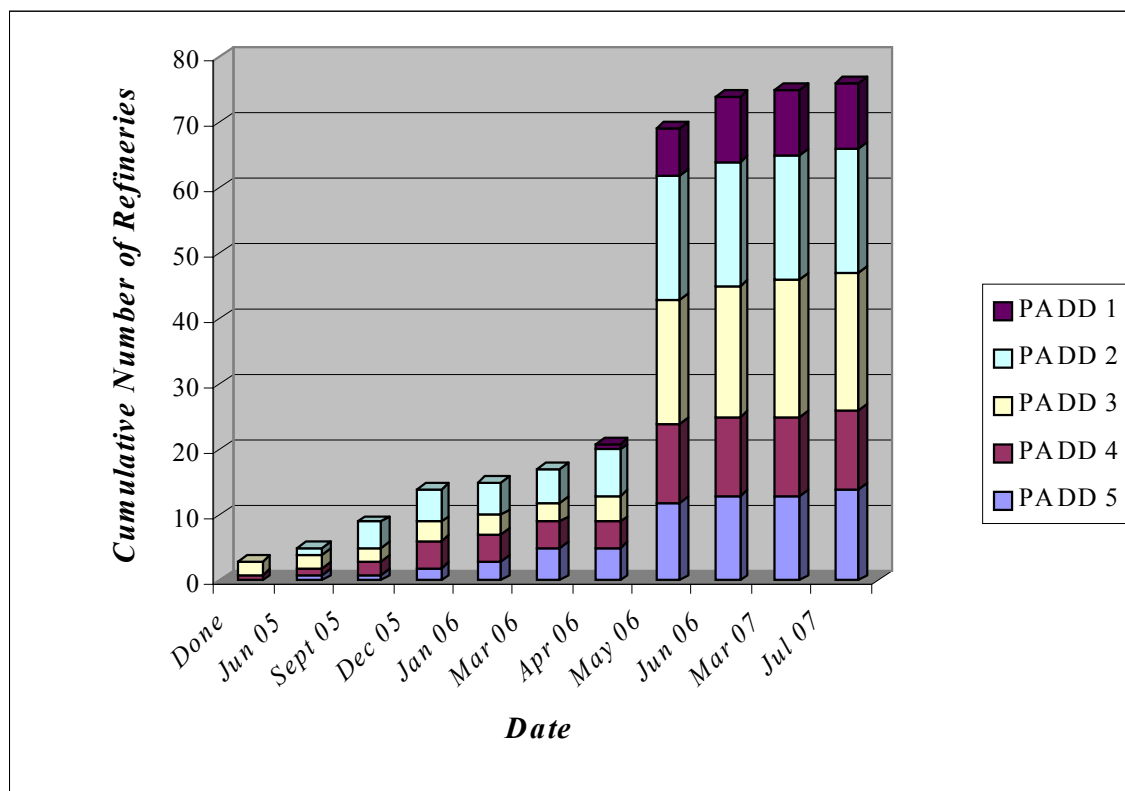


Figure 6. Projected Start-up Dates for Producing 15 ppm Highway Diesel Fuel<sup>h</sup>

### 6. Revamped Versus Grassroots Projects

In the final highway diesel rule, we projected that, in order to meet the 15 ppm sulfur standard, refiners would use similar hydrotreating technology to that which is currently being used to meet the 500 ppm sulfur standard. In doing so, refiners would either need to install new

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<sup>h</sup> While some refineries reported their projected start-up date on a monthly basis, others reported on a quarterly basis. For those that reported on a quarterly basis, we assumed the month that would correspond with the end of the quarter to be conservative.

## II. Summary Statistics - Nationwide Analysis

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hydrotreating equipment or revamp their current hydrotreaters/desulfurization equipment.

Seventy-nine refineries reported that they would either be revamping existing equipment or constructing new facilities, 50 (73 percent) refineries reported plans for revamping existing equipment, 19 (24 percent) refineries reported that they would be installing new equipment, and 10 (13 percent) refineries reported they would be doing both. This is roughly in line with the projections that we made in the highway diesel final rule, and also the anticipated plans that refiners reported last year. In their 2003 pre-compliance reports, 75 percent reported anticipated plans for revamping existing equipment, 15 percent were anticipating installing a new unit, and 10 percent reported that they would be doing both.

Twelve refineries reported they either did not need to install new desulfurization capacity or revamp existing desulfurization units, including two refineries that plan to transport part of their distillate to other refineries for desulfurization. Another six refineries have that they are still evaluating options and another 14 refineries are currently unsure of their future desulfurization plans. Some of these refineries are owned by small refiners, some are anticipating using credits to comply, some refineries expect to refine their high-sulfur diesel fuel at other facilities, and others reported that they would not be producing 15 ppm sulfur fuel. The remaining 21 refineries are still in the process of finalizing their plans.

### 7. Small and GPA Refiner Options

#### Small Refiners

As discussed in greater detail above, the highway diesel fuel regulations contain three options which provide qualified small refiners with additional flexibilities to the TCO. Option A, the 500 ppm Sulfur Option, allows a refinery owned by an approved small refiner to delay production of 15 ppm sulfur fuel until the end of the TCO (May 2010). This option would enable a refinery to continue to produce all of its highway diesel fuel at the 500 ppm sulfur standard during the TCO years, provided the refiner shows in its pre-compliance report that adequate supplies of 15 ppm sulfur highway diesel fuel will be available in the refinery's marketing area. Option A was chosen by six refineries. Based on the reports received from these refineries, it is expected that their total production for 2006 will be five thousand bbls/day of 500 ppm highway diesel fuel.

Option B, the Small Refiner Credit Option, allows a small refiner to generate credits for any 'early' (since small refiners have until 2010 to comply with the 15 ppm standards under the highway diesel rule) volume of 15 ppm sulfur highway diesel fuel produced. This option was chosen by six refineries. Refineries using this option will likely have a mix of 500 ppm and 15 ppm highway diesel fuel in 2006. Based on reported data, it is anticipated that in 2006 the six



**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

refineries choosing this option will produce a total of 33 thousand bbls/day, of which 15 ppm sulfur fuel is 96 percent of the total production volume.

Lastly, option C, the Diesel/Gasoline Compliance Date Option, allows a refinery owned by a small refiner the ability to delay its compliance date for the Tier 2 gasoline sulfur standards for up to three years if the refinery produces 95 percent of its highway diesel fuel (above a minimum volume limit tied to the refinery’s baseline volume) at the 15 ppm sulfur standard by June 1, 2006. Nine refineries have chosen this option. These refineries reported that they expect to produce 99 thousand bbls/day of 15 ppm sulfur highway diesel fuel in 2006.

The volumes reported by refineries regarding the small refiner options are shown in Table 5 below.

<b>Table 5. Intended Small Refiner Compliance Options by Number of Refineries and Highway Diesel Fuel Production Capacity</b>			
<b>Option</b>	<b>Description</b>	<b>Number of Refineries</b>	<b>2006 Highway Diesel Fuel Production Capacity (000 bbls/day)</b>
A.	500 ppm sulfur Option	6	5
B.	Credit Option	9	33
C.	Diesel/Gasoline Compliance Date Option	6	99
	Total	21	138

**GPA Refiners**

The highway diesel fuel regulations also contain an option that allows a GPA refinery to delay its compliance date for the final Tier 2 gasoline sulfur standards by two years provided that the refinery produces 95 percent of its highway diesel fuel (above a minimum volume threshold tied to the refinery’s baseline volume) at the 15 ppm sulfur standard by June 1, 2006. Twelve of the 35 GPA refineries reported that they would be using this option with an anticipated production volume in 2006 of approximately 92 thousand bbls/day.

### B. PADD Analysis

The following discussion presents information specific to each PADD. Tables 6 through 9 below show the reported number of refineries and anticipated highway diesel fuel volumes for each PADD for 2006 and 2010. A total of four refineries will be shifting into the highway diesel fuel market in 2006, and an additional two will shift into the market by the end of the TCO. At the start of the TCO in 2006, over 415 thousand bbls/day of credits will be generated, though only six refineries anticipate that they will need to use those credits.

As shown in the tables, a decrease in production (relative to the year 2000) is projected for PADD 1 (from slightly over 10 percent in 2006 to less than two percent in 2010), and PADD 4 (less than one percent), and increases are projected in all of the other PADDs. Data from Table 32 of EIA's Petroleum Supply Annual for 2000-2003 show that PADDs 2 and 3 have historically transferred fuel to PADD 1 in relatively large quantities such that inter-PADD transfers should be able to offset the decrease in PADD 1. Similarly, the slight decrease that is predicted for PADD 4 in 2010, should be able to be offset by inter-PADD transfers as well.

More detailed information by PADD is shown in Tables 10 through 19, below.

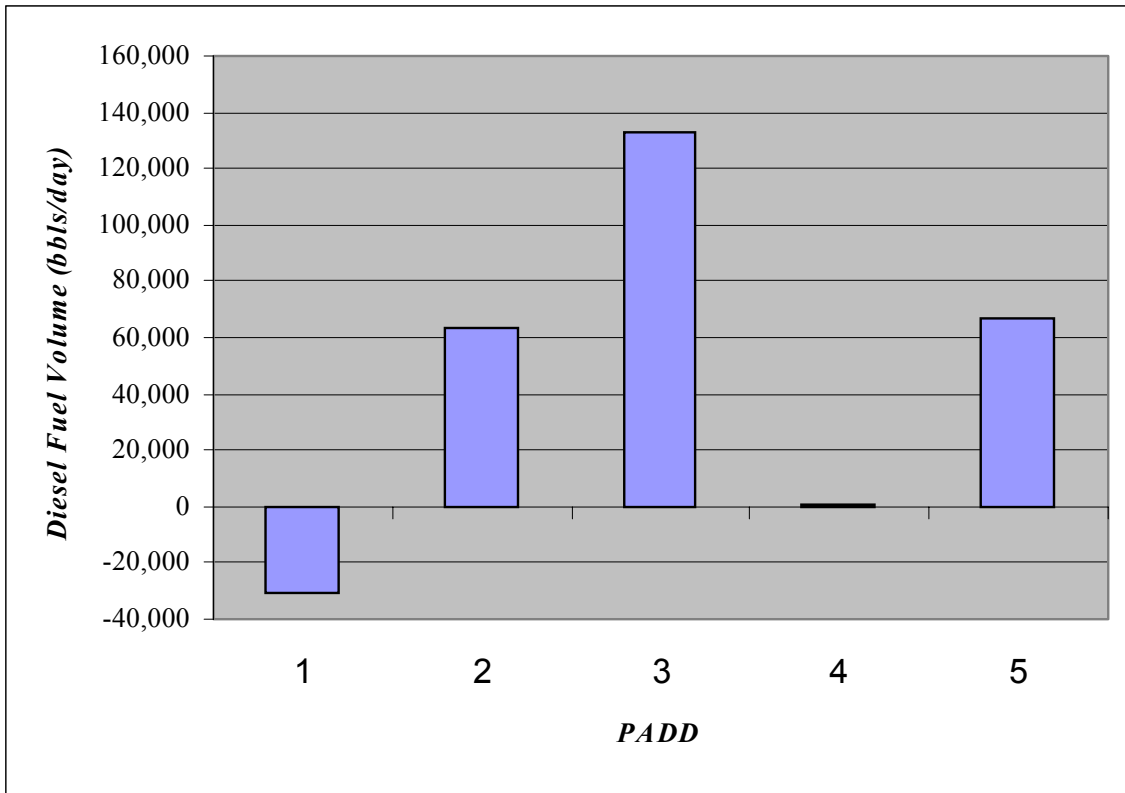
**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

<b>Table 6. Projected Number of Highway Diesel Fuel Refineries by PADD for 2006</b>						
<b>PADD</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total U.S.</b>
# refineries producing highway diesel fuel	11	23	39	15	22	110
# refineries at 100% 15 ppm	9	17	30	12	19	87
# refineries at 100% 500 ppm	0	3	6	2	1	12
# refineries with 15/500 ppm mix	2	3	3	1	2	11
# refineries increasing production (vs. EIA 2003)	7	19	25	8	17	76
# refineries shifting into the highway market	0	1	0	1	2	4
# refineries decreasing production (vs. EIA 2003)	6	6	17	7	7	43
# refineries shifting out of the highway market	2	2	3	0	2	9
# refineries generating credits	10	13	25	2	7	57
# refineries using credits	0	1	5	0	0	6

<b>Table 7. Projected Volumes of Highway Diesel Fuel by PADD for 2006</b>						
<b>PADD</b>	<b>1*</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total U.S.</b>
Total 15 ppm (bbls/day)	268,454	679,160	1,163,014	117,981	408,510	2,637,120
Total 500 ppm (bbls/day)	1,097	38,768	88,139	3,247	9,677	140,928
Total 15 + 500 ppm (bbls/day)	269,551	717,928	1,251,153	121,228	418,187	2,778,048
Net volume change vs. 2000 (bbls/day)	-30,951	63,791	132,604	354	66,745	232,544
% change from 2000 highway volume	-10.3	9.8	11.9	0.3	19.0	9.1
% 500 of total 15 + 500 ppm	0.4	5.4	7.0	2.7	2.3	5.1
Credit generation (bbls/day)	52,120	105,870	234,885	5,830	16,540	415,245
Credit usage (bbls/day)	0	6,905	62,081	0	0	68,985

\* The change that is projected for PADD 1 will be offset by imports and inter-PADD transfers. Historically, PADDs 2 and 3 have transferred fuel to PADD 1 in relatively large quantities.

## II. Summary Statistics - PADD Analysis



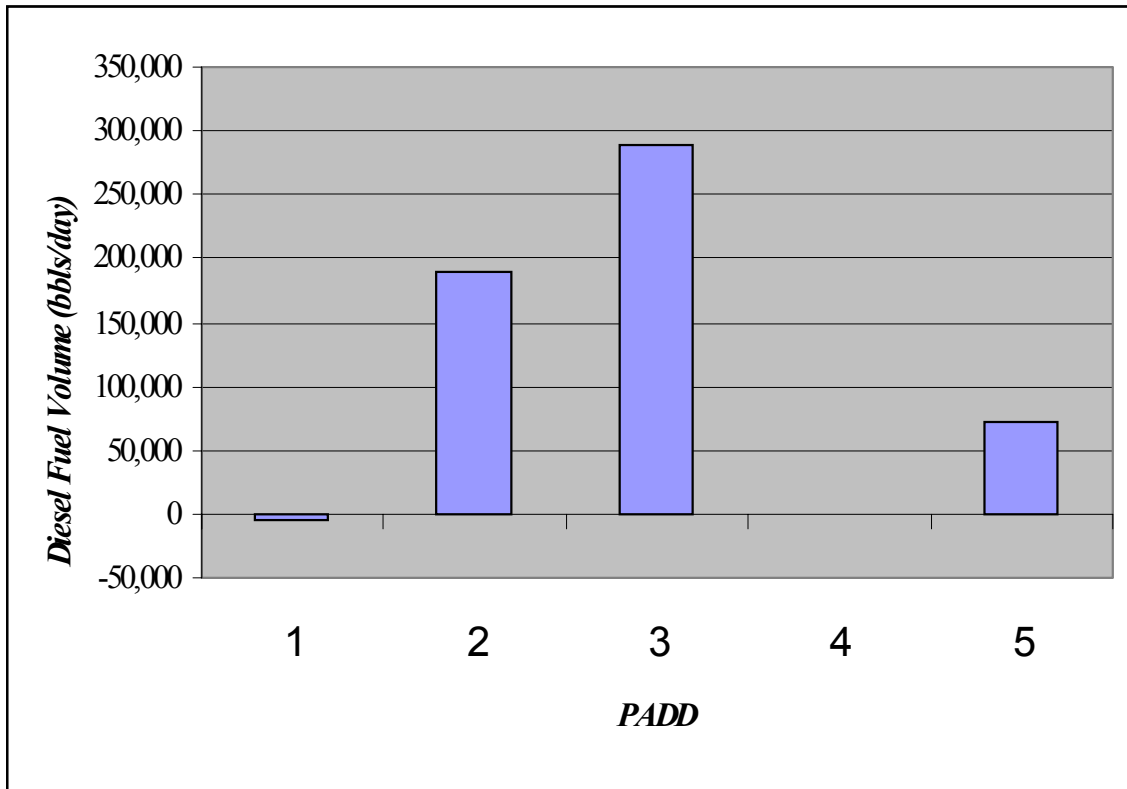
**Figure 7. Highway Diesel Fuel Production Change 2006 vs. 2000 (by PADD)**

**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

<b>Table 8.</b>						
<b>Projected Number of Highway Diesel Fuel Refineries by PADD for 2010</b>						
<b>PADD</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total U.S.</b>
# refineries producing highway diesel fuel	12	25	39	15	23	114
# refineries at 100% 15 ppm	10	19	33	14	21	97
# refineries at 100% 500 ppm	0	3	4	1	1	9
# refineries with 15/500 ppm mix	2	3	2	0	1	8
# refineries increasing production (vs. 2003)	8	22	28	8	20	86
# refineries shifting into the highway market	1	1	0	1	3	6
# refineries decreasing production (vs. 2003)	6	3	14	7	5	35
# refineries shifting out of the highway market	2	0	3	0	2	7
# refineries generating credits						
# refineries using credits	0	1	2	0	0	3

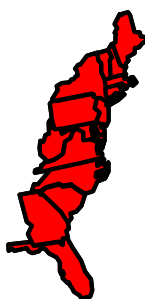
<b>Table 9.</b>						
<b>Projected Volume of Highway Diesel Fuel by PADD for 2010</b>						
<b>PADD</b>	<b>1*</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total U.S.</b>
Total 15 ppm ( <i>bbls/day</i> )	293,706	803,955	1,382,321	119,269	422,985	3,022,236
Total 500 ppm ( <i>bbls/day</i> )	1,167	38,894	24,641	1,249	1,360	67,311
Total 15 + 500 ppm ( <i>bbls/day</i> )	294,874	842,849	1,406,962	120,518	424,345	3,089,547
Net volume change vs. 2000 ( <i>bbls/day</i> )	-5,629	188,712	288,413	-356	72,903	544,043
% change from 2000 highway volume	-1.9	28.8	25.8	-0.3	20.7	21.4
% 500 of total 15 + 500 ppm	0.4	4.6	1.8	1.0	0.3	2.2
Credit generation ( <i>bbls/day</i> )	0	0	0	0	0	0
Credit usage ( <i>bbls/day</i> )	0	6,954	13,272	0	0	20,225
* The change that is projected for PADD 1 will be offset by imports and inter-PADD transfers. Historically, PADDs 2 and 3 have transferred fuel to PADD 1 in relatively large quantities.						

## II. Summary Statistics - PADD Analysis



**Figure 8. Highway Diesel Fuel Production Change 2010 vs. 2000 (by PADD)**

**1. PADD 1**



*Number of Refineries*

Reported totals for all PADD 1 refineries and importers are summarized in Tables 10 and 11, below. These tables show that for the first year of the TCO (2006), 11 refineries projected the production of a volume of over 269 thousand bbls/day total (15 ppm sulfur + 500 ppm sulfur) highway diesel fuel. This projection is down slightly from the numbers reported in the 2003 pre-compliance reports of 12 refineries producing an estimated 285 thousand bbls/day of highway diesel fuel. More specifically, nine refineries reported that they intend to produce 100 percent of their highway diesel fuel with 15 ppm or less of sulfur in 2006, and no refineries intend to produce 100 percent of their highway diesel fuel at the 500 ppm sulfur level. Two refineries reported that they intend to produce a mix of 15 ppm and 500 ppm sulfur highway diesel fuel. Seven refineries reported that they intend to produce more highway diesel fuel than they did in 2000, while six refineries intend to produce less highway diesel fuel than they did in 2000. Four refineries intend to shift out of the highway diesel fuel market and one refinery intends to enter the highway diesel fuel market in 2010.

*Highway Diesel Fuel Production<sup>i</sup>*

As shown in Table 10, the seven refineries planning to produce more highway diesel fuel than in 2000 reported a cumulative increase in their highway diesel fuel production volume of approximately 79 thousand bbls/day, and the six refineries planning to produce less highway diesel fuel than in 2000 reported a cumulative decrease in their highway diesel fuel production volume of approximately 110 thousand bbls/day. This results in a projected net decrease of approximately 31 thousand bbls/day for 2006. However, in 2010, the projected net reduction in the volume of highway diesel fuel produced decreases to less than six thousand bbls/day.

While these results indicate that there will be a reduction in the production of highway diesel fuel in PADD 1, these reductions are not of great concern given the fact that the overall

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<sup>i</sup> As described above, the base volume of highway diesel fuel for the year 2000 (as shown in Table 11) that we for comparisons is slightly higher than the volume used in the Summary and Analysis of the Highway Diesel Fuel 2003 Pre-compliance Reports. One PADD 1 refinery submitted a pre-compliance report at such a time that it was not feasible to include its data in the 2003 pre-compliance report summary. Thus, we have included this data in today's Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports.

## II. Summary Statistics - PADD Analysis

decline in net fuel volume (relative to 2000 volumes) decreases throughout the duration of the TCO, and the volume increases in PADDs 2 and 3, which historically transport diesel fuel to PADD 1, are much larger.

### *Availability of 15 ppm Sulfur Highway Diesel Fuel*

As shown below in Figure 10, in 2006 more than 268 thousand bbls/day, or 99 percent of the PADD 1 total, are anticipated to be 15 ppm sulfur highway diesel fuel, and the remaining one thousand bbls/day are anticipated to be 500 ppm sulfur highway diesel fuel. The projections for 2010 also show that the amount of 15 ppm sulfur highway diesel fuel continues to be 99 percent of the total highway diesel fuel production for PADD 1.

### *Credit Generation and Use*

In 2006 for PADD 1, 52 thousand bbls/day credits are anticipated to be generated, while no credits are anticipated to be used.

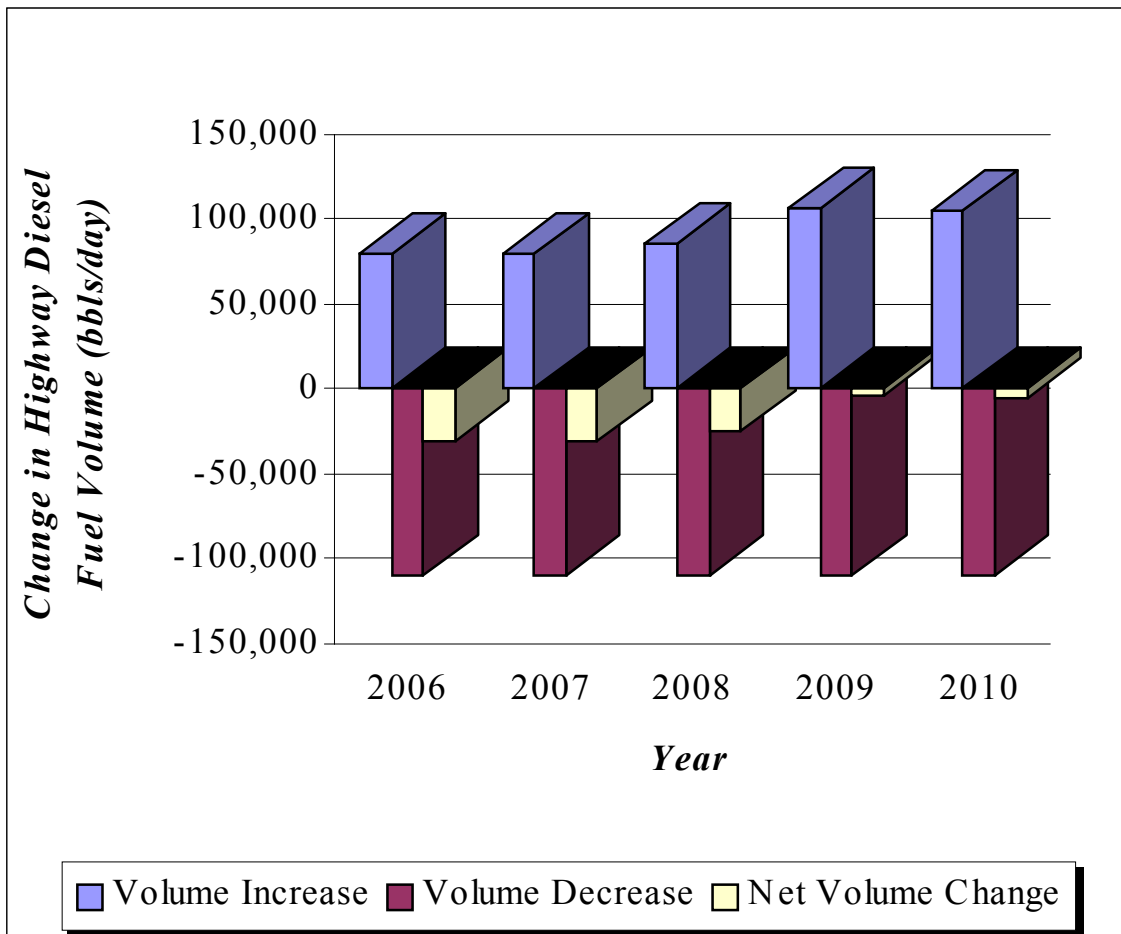
<b>Table 10.</b>						
<b>PADD 1 Highway Diesel Fuel Refinery Statistics 2006-2010</b>						
Year	2003	2006	2007	2008	2009	2010
# refineries producing highway diesel fuel	13	11	11	11	12	12
# refineries at 100% 15 ppm		9	9	8	9	10
# refineries at 100% 500 ppm	13	0	0	0	0	0
# refineries with 15/500 ppm mix		2	2	3	3	2
# refineries increasing production (vs. 2003)		7	7	7	8	8
# refineries shifting into the highway market		0	0	0	1	1
# refineries decreasing production (vs. 2003)		6	6	6	6	6
# refineries shifting out of the highway market		2	2	2	2	2
# refineries generating credits		10	10	10	11	
# refineries using credits		0	0	0	0	0
# refineries that were not able to provide volume data		2	2	2	2	2



**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

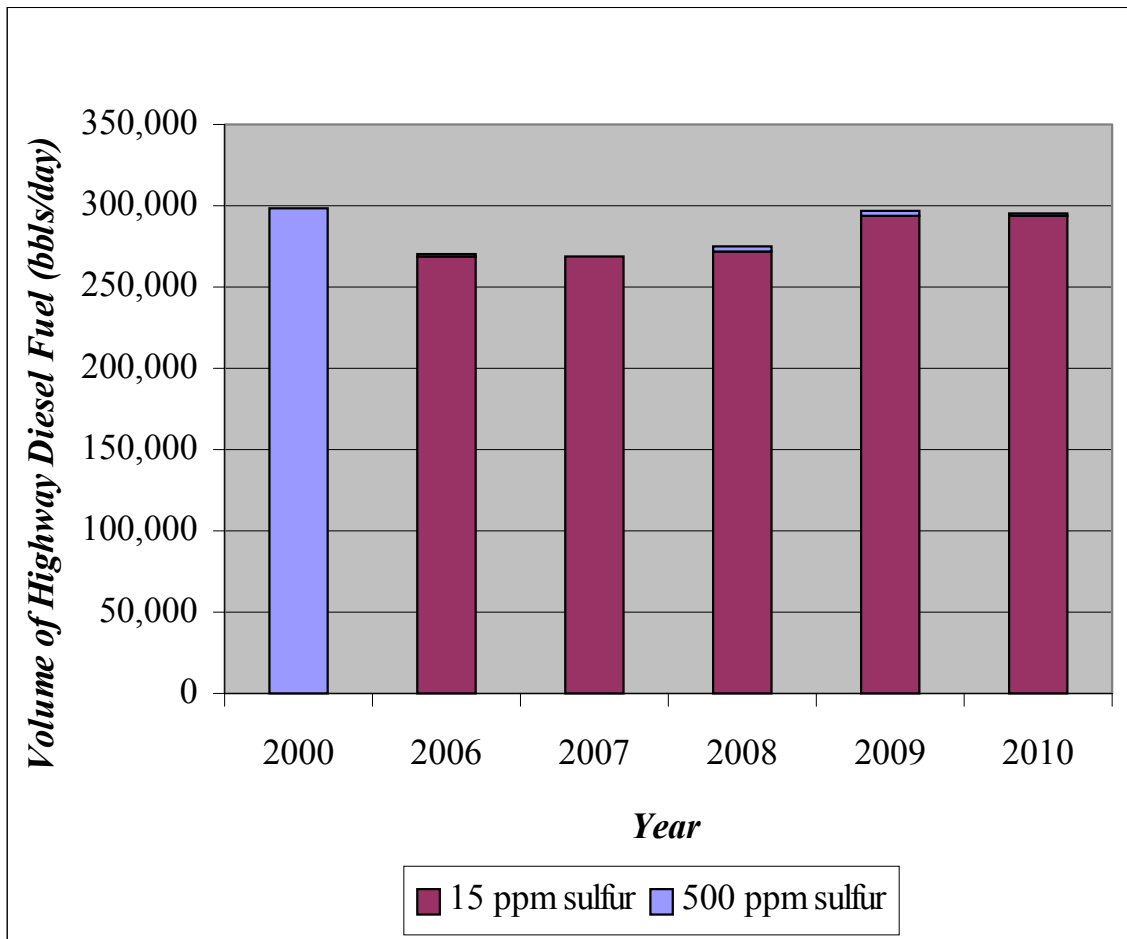
<b>Table 11.</b>						
<b>PADD 1 Highway Diesel Fuel Volume and Credit Statistics 2006-2010*</b>						
<b>Year</b>	<b>2000</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total 15 ppm (bbls/day)		268,454	268,186	272,180	293,397	293,706
Total 500 ppm (bbls/day)	297,903	1,097	1,159	2,815	2,815	1,167
Total 15 + 500 ppm (bbls/day)	297,903	269,551	269,345	274,995	296,212	294,874
Net volume change vs. 2000 (bbls/day)		-30,951	-31,157	-25,508	-4,291	-5,629
% change from 2000 highway volume		-10.3	-10.4	-8.5	-1.4	-1.9
% 500 of total 15 + 500 ppm	100.0	0.4	0.4	1.0	1.0	0.4
Credit generation (bbls/day)		52,120	52,014	51,488	55,731	
Credit usage (bbls/day)		0	0	0	0	0
* The change that is projected for PADD 1 will be offset by imports and inter-PADD transfers. Historically, PADDs 2 and 3 have transferred fuel to PADD 1 in relatively large quantities.						

## II. Summary Statistics - PADD Analysis



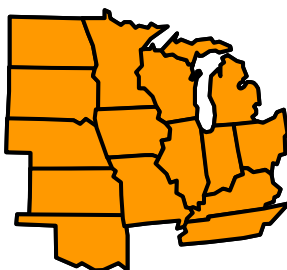
**Figure 9. PADD 1 Highway Diesel Fuel Volume Change vs. 2000**

**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**



**Figure 10. PADD 1 Projected Highway Diesel Fuel Production, 2006-2010**

### 2. PADD 2



#### *Number of Refineries*

The reported totals for all PADD 2 refineries are summarized in Tables 12 and 13, below. These tables show that for 2006, the first year of the TCO, 23 refineries reported that they intend to produce an estimated volume of approximately 718 thousand bbls/day total (15 ppm sulfur + 500 ppm sulfur) highway diesel fuel. This projection is slightly down from the 739 thousand bbls/day that refiners estimated in the 2003 pre-compliance reports. In the 2004 pre-compliance reports 17 refineries reported that they intend to produce 100 percent of their highway diesel fuel with 15 ppm or less of sulfur. Additionally, three refineries intend to produce 100 percent of their highway diesel fuel at the 500 ppm sulfur level, and three refineries intend to produce a mix of 15 ppm sulfur and 500 ppm sulfur highway diesel fuel. Nineteen refineries reported that they intend to produce more highway diesel fuel than they did in 2000, including one refinery that produced no highway diesel fuel in 2000. Six refineries reported that they intend to produce less highway diesel fuel than they did in 2000, including one refinery that intends to temporarily shift out of the highway diesel fuel market. This is consistent with the projections in the 2003 pre-compliance reports.

In 2010, the last year of the TCO, the one refinery that produced highway diesel fuel in 2000 but will be shifting out of the highway market in 2006 expects to shift back into the highway diesel fuel market with all of its highway diesel fuel production meeting the 15 ppm sulfur standard.

#### *Highway Diesel Fuel Production*

As shown in Figure 11, below, the 19 refineries planning to produce more highway diesel fuel in 2006 than they did in 2000 reported a cumulative increase in their highway diesel fuel production volume of over 136 thousand bbls/day, and the five refineries planning to produce less highway diesel fuel than they did in 2000 reported a cumulative decrease in their highway diesel fuel production volume of approximately 72 thousand bbls/day. This results in a net increase of nearly 64 thousand bbls/day of highway diesel fuel production. In 2010, the net increase rises to approximately 188 thousand bbls/day.

**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

*Availability of 15 ppm Sulfur Highway Diesel Fuel*

As shown below in Table 13, 679 thousand bbls/day, or 95 percent of the PADD 2 total, are anticipated to be 15 ppm sulfur highway diesel fuel in 2006. The remaining five percent (almost 39 thousand bbls/day) is anticipated to be 500 ppm sulfur highway diesel fuel. Though the projected volume of total highway diesel fuel for 2006 is less than the amount anticipated in the 2003 pre-compliance reports, the projected volume increases during the TCO. In 2010, it is projected that over 842 thousand bbls/day will be produced, which is greater than the 818 thousand bbls/day volume that was projected in last year’s pre-compliance reports.

*Projected Credit Generation and Use*

In 2006 for PADD 2, nearly 106 thousand bbls/day of credits are anticipated to be generated while approximately seven thousand bbls/day of credits are expected to be used. This will yield a net generation of 99 thousand bbls/day of credits.

<b>Table 12. PADD 2 Highway Diesel Fuel Refinery Statistics 2006-2010</b>						
<b>Year</b>	<b>2003</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
# refineries producing highway diesel fuel	24	23	24	24	24	25
# refineries at 100% 15 ppm		17	18	18	18	19
# refineries at 100% 500 ppm	24	3	3	3	3	3
# refineries with 15/500 ppm mix		3	3	3	3	3
# refineries increasing production (vs. 2003)		19	20	20	20	22
# refineries shifting into the highway market		1	1	1	1	1
# refineries decreasing production (vs. 2003)		6	5	5	5	3
# refineries shifting out of the highway market		2	1	1	1	0
# refineries generating credits		13	13	13	13	
# refineries using credits		1	1	1	1	1

## II. Summary Statistics - PADD Analysis

<b>Table 13.</b>						
<b>PADD 2 Highway Diesel Fuel Volume and Credit Statistics 2006-2010</b>						
<b>Year</b>	<b>2000</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total 15 ppm ( <i>bbls/day</i> )		679,160	735,075	729,093	734,578	803,955
Total 500 ppm ( <i>bbls/day</i> )	654,137	38,768	38,768	38,778	38,524	38,894
Total 15 + 500 ppm ( <i>bbls/day</i> )	654,137	717,928	773,843	767,871	773,102	842,849
Net volume change vs. 2000 ( <i>bbls/day</i> )		63,791	119,706	113,734	118,965	188,712
% change from 2000 highway volume		9.8	18.3	17.4	18.2	28.8
% 500 of total 15 + 500 ppm	100.0	5.4	5.0	5.1	5.0	4.6
Credit generation ( <i>bbls/day</i> )		105,870	108,174	106,882	108,174	
Credit usage ( <i>bbls/day</i> )		6,905	6,904	6,904	6,904	6,954

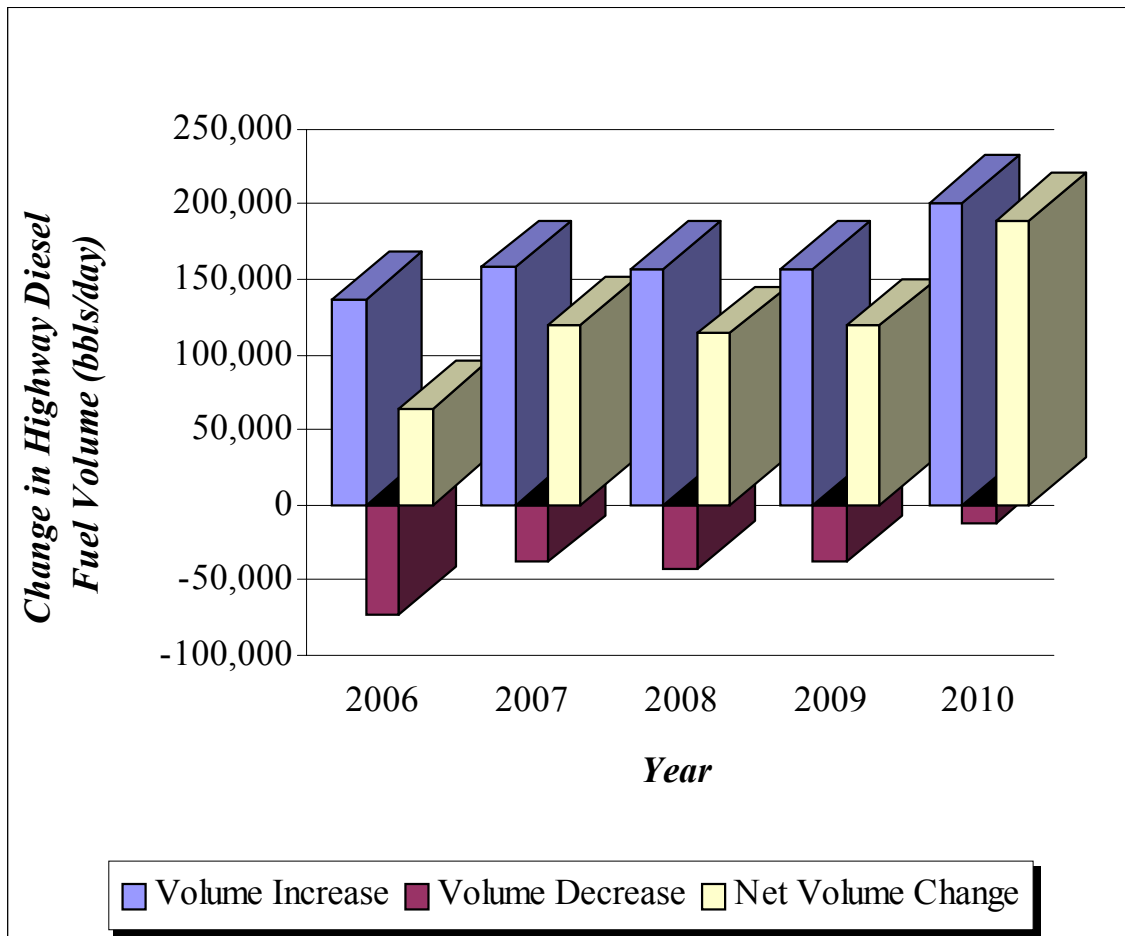
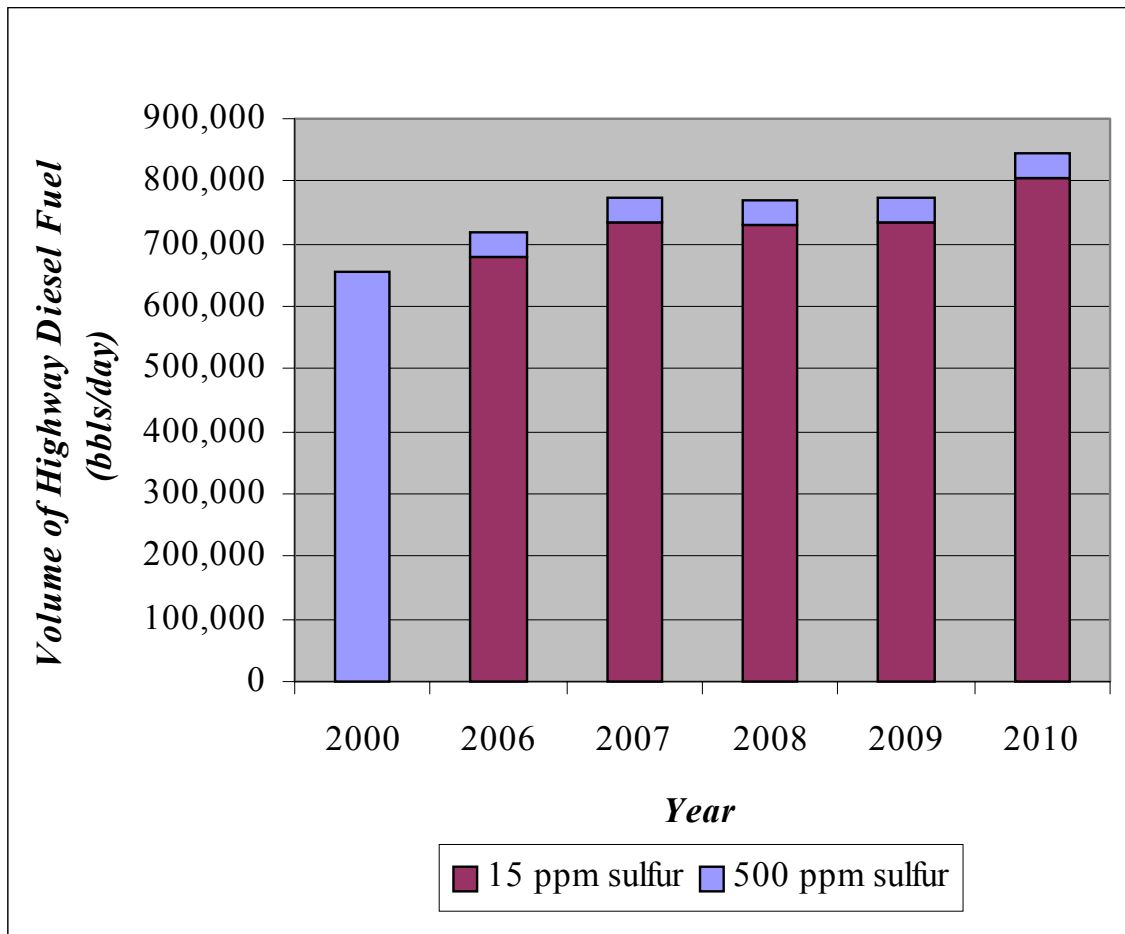


Figure 11. PADD 2 Highway Diesel Fuel Volume Change vs. 2000

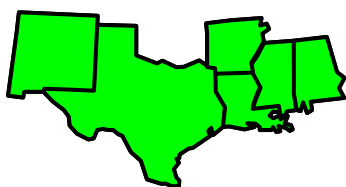
## II. Summary Statistics - PADD Analysis



**Figure 12. PADD 2 Projected Highway Diesel Fuel Production, 2006-2010**



**3. PADD 3**



*Number of Refineries*

Reported totals for all PADD 3 refineries are summarized in Tables 14 and 15, below. These tables show that in 2006, the first year of the TCO, 39 refineries reported that they intend to produce an estimated volume of over 1.2 million bbls/day total (15 ppm sulfur + 500 ppm sulfur) highway diesel fuel. Specifically, 30 refineries (up from the 29 refineries reported in 2003) reported that they intend to produce 100 percent of their highway diesel fuel with 15 ppm or less of sulfur. Also, six refineries intend to produce 100 percent of their highway diesel fuel at the 500 ppm sulfur level, and three refineries intend to produce a mix of 15 ppm sulfur and 500 ppm sulfur highway diesel fuel. It was reported that 25 refineries intend to produce more highway diesel fuel in 2006 than they did in 2000, this is up from the 23 refineries that reported an expected increase in the 2003 pre-compliance reports. In the 2003 reports, one refinery that produced no highway diesel fuel in 2000 indicated its intention to enter the highway market; however, this year's reports show that there will not be any refineries entering the highway market during the TCO. Seventeen refineries intend to produce less highway diesel fuel than they did in 2000, including three refineries that intend to shift out of the highway diesel fuel market.

*Highway Diesel Fuel Production*

As shown in Figure 13, below, the 25 refineries planning to produce more highway diesel fuel than they did in 2000 reported a cumulative increase in their highway diesel fuel production volume of approximately 370 thousand bbls/day, and the 17 refineries planning to produce less highway diesel fuel than they did in 2000 reported a cumulative decrease in their highway diesel fuel production volume of approximately 237 thousand bbls/day. This results in a net increase of 132 thousand bbls/day of highway diesel fuel production. In 2010, the net increase is approximately 189 thousand bbls/day.

*Availability of 15 ppm Sulfur Highway Diesel Fuel*

Table 15 shows that in 2006 over 1.1 million bbls/day, or 93 percent of the PADD 3 total, are anticipated to be 15 ppm sulfur highway diesel fuel, the remaining percentage (88 thousand bbls/day) is anticipated to be 500 ppm sulfur highway diesel fuel.

## II. Summary Statistics - PADD Analysis

### *Credit Generation and Use*

In 2006, credit generation is anticipated to be approximately 235 thousand bbls/day, and only approximately 62 thousand bbls/day are anticipated to be used; yielding a net credit generation of almost 173 thousand bbls/day.

<b>Table 14. PADD 3 Highway Diesel Fuel Refinery Statistics 2006-2010</b>						
<b>Year</b>	<b>2003</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
# refineries producing highway diesel fuel	42	39	39	39	39	39
# refineries at 100% 15 ppm		30	30	30	31	33
# refineries at 100% 500 ppm	42	6	6	6	5	4
# refineries with 15/500 ppm mix		3	3	3	3	2
# refineries increasing production (vs. 2003)		25	26	26	24	28
# refineries shifting into the highway market		0	0	0	0	0
# refineries decreasing production (vs. 2003)		17	16	16	18	14
# refineries shifting out of the highway market		3	3	3	3	3
# refineries generating credits		25	25	25	26	
# refineries using credits		5	4	4	3	2

**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

<b>Table 15.</b>						
<b>PADD 3 Highway Diesel Fuel Volume and Credit Statistics 2006-2010</b>						
<b>Year</b>	<b>2000</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total 15 ppm ( <i>bbls/day</i> )		1,163,014	1,193,122	1,225,061	1,242,437	1,382,321
Total 500 ppm ( <i>bbls/day</i> )	1,118,549	88,139	91,931	91,945	59,531	24,641
Total 15 + 500 ppm ( <i>bbls/day</i> )	1,118,549	1,251,153	1,285,053	1,317,006	1,301,968	1,406,962
Net volume change vs. 2000 ( <i>bbls/day</i> )		132,604	166,504	198,457	183,419	288,413
% change from 2000 highway volume		11.9	14.9	17.7	16.4	25.8
% 500 of total 15 + 500 ppm	100.0	7.0	7.2	7.0	4.6	1.8
Credit generation ( <i>bbls/day</i> )		234,885	236,102	242,732	246,012	
Credit usage ( <i>bbls/day</i> )		62,081	60,104	60,115	34,184	13,272

## II. Summary Statistics - PADD Analysis

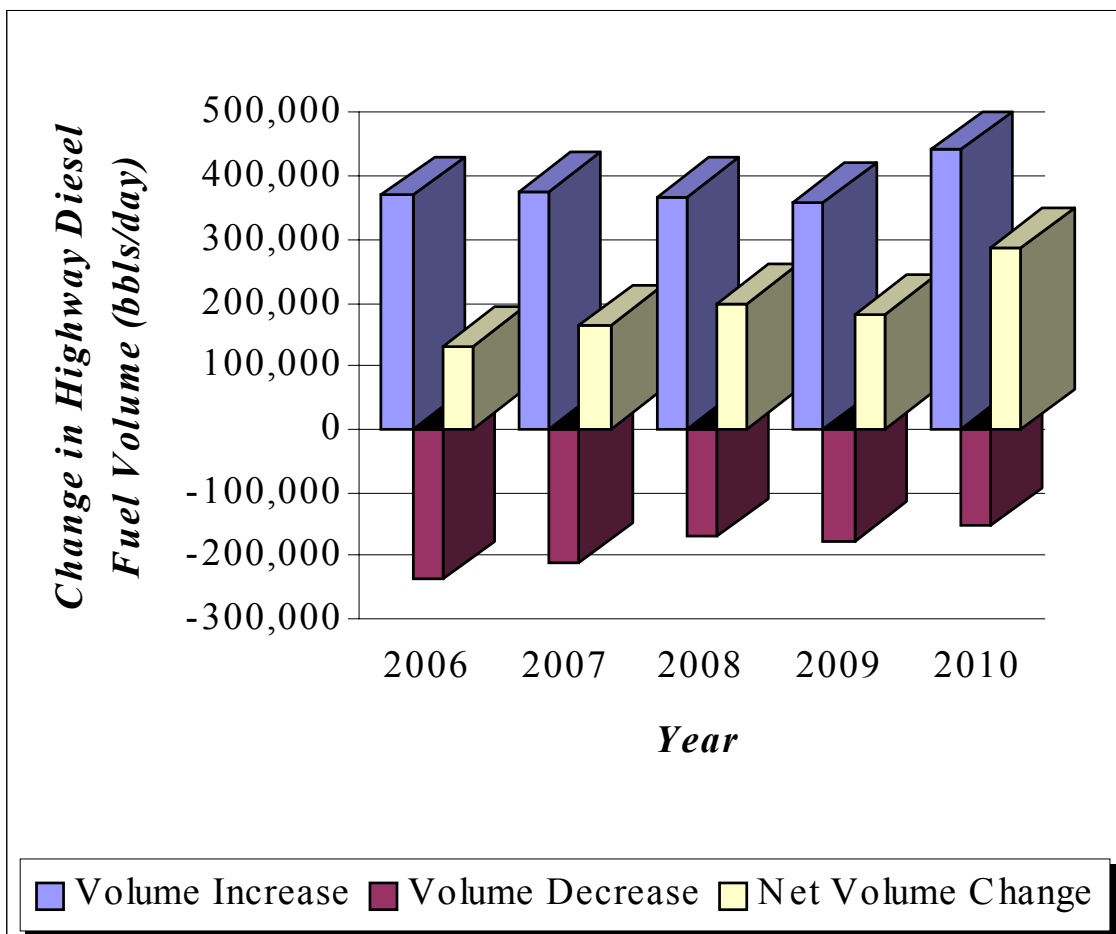
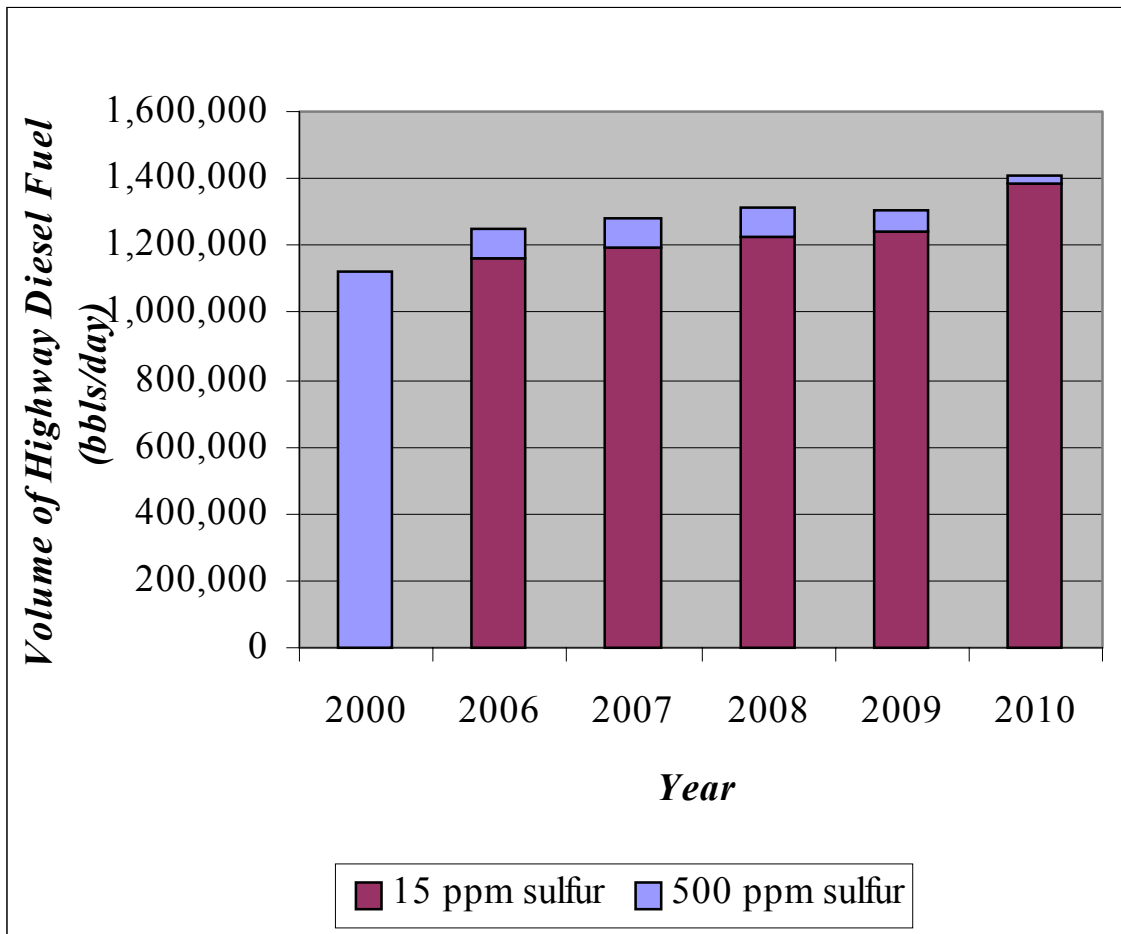
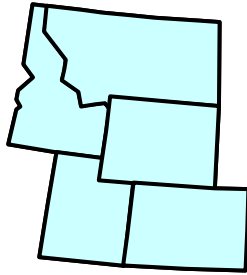


Figure 13. PADD 3 Highway Diesel Fuel Volume Change vs. 2000



**Figure 14. PADD 3 Projected Highway Diesel Fuel Production, 2006-2010**

### 4. PADD 4



#### *Number of Refineries*

Reported totals for all PADD 4 refineries are summarized in Tables 16 and 17, below. These tables show that for the first year of the TCO (2006), 15 refineries reported that they intend to produce an estimated volume of 121 thousand bbls/day total (15 ppm sulfur + 500 ppm sulfur) highway diesel fuel. The 2004 reports show that 12 refineries intend to produce 100 percent of their highway diesel fuel with 15 ppm or less of sulfur and one refinery intends to produce a mix of 15 ppm sulfur and 500 ppm sulfur highway diesel fuel. Similar to the 2003 reports, two refineries still intend to produce 100 percent of their highway diesel fuel at the 500 ppm sulfur level. For 2006, eight refineries reported that they intend to produce more highway diesel fuel than they did in 2000, including one refinery that produced no highway diesel fuel in 2000. Seven refineries intend to produce less highway diesel fuel than they did in 2000.

#### *Highway Diesel Fuel Production*

As shown in Figure 15, below, in 2006, the eight refineries planning to produce more highway diesel fuel than they did in 2000 reported a cumulative increase in their highway diesel fuel production volume of approximately 22 thousand bbls/day, and the seven refineries planning to produce less highway diesel fuel than they did in 2000 reported a cumulative decrease in their highway diesel fuel production volume of just over 21 thousand bbls/day. This results in essentially no net change in production (a slight increase of approximately 350 bbls/day) Projected production in PADD 4 remains essentially constant through 2010, as shown in Figure 16.

#### *Availability of 15 ppm Sulfur Highway Diesel Fuel*

As shown in Table 17, below, in 2006, approximately 118 thousand bbls/day, or 97 percent of the PADD 4 total, are anticipated to be 15 ppm sulfur highway diesel fuel. Though the volume of highway diesel fuel is projected to decrease slightly in 2010, the percentage of highway diesel fuel at the 15 ppm sulfur standard is expected to increase to 99 percent of the total volume of highway diesel fuel produced in PADD 4.

## **Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

### *Credit Generation and Use*

The volume of credits generated in 2006 are anticipated to be approximately 5,830 bbls/day for PADD 4. As with the projections from 2003, no credits are anticipated to be used in this PADD. Further, two refineries have indicated that they are planning to produce 100 percent of their highway diesel at the 500 ppm sulfur level until 2010.

## II. Summary Statistics - PADD Analysis

<b>Table 16.</b>						
<b>PADD 4 Highway Diesel Fuel Refinery Statistics 2006-2010</b>						
<b>Year</b>	<b>2003</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
# refineries producing highway diesel fuel	14	15	15	15	15	15
# refineries at 100% 15 ppm		12	12	12	13	14
# refineries at 100% 500 ppm	14	2	2	2	2	1
# refineries with 15/500 ppm mix		1	1	1	0	0
# refineries increasing production (vs. 2003)		8	8	8	8	8
# refineries shifting into the highway market		1	1	1	1	1
# refineries decreasing production (vs. 2003)		7	7	7	7	7
# refineries shifting out of the highway market		0	0	0	0	0
# refineries generating credits		2	2	2	2	
# refineries using credits		0	0	0	0	0

<b>Table 17.</b>						
<b>PADD 4 Highway Diesel Fuel Volume and Credit Statistics 2006-2010</b>						
<b>Year</b>	<b>2000</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total 15 ppm (bbls/day)		117,981	116,856	117,132	116,657	119,269
Total 500 ppm (bbls/day)	120,874	3,247	3,232	3,232	3,197	1,249
Total 15 + 500 ppm (bbls/day)	120,874	121,228	120,087	120,364	119,854	120,518
Net volume change vs. 2000 (bbls/day)		354	-787	-510	-1,020	-356
% change from 2000 highway volume		0.3	-0.7	-0.4	-0.8	-0.3
% 500 of total 15 + 500 ppm	100.0	2.7	2.7	2.7	2.7	1.0
Credit generation (bbls/day)		5,830	5,537	5,520	5,568	
Credit usage (bbls/day)		0	0	0	0	0



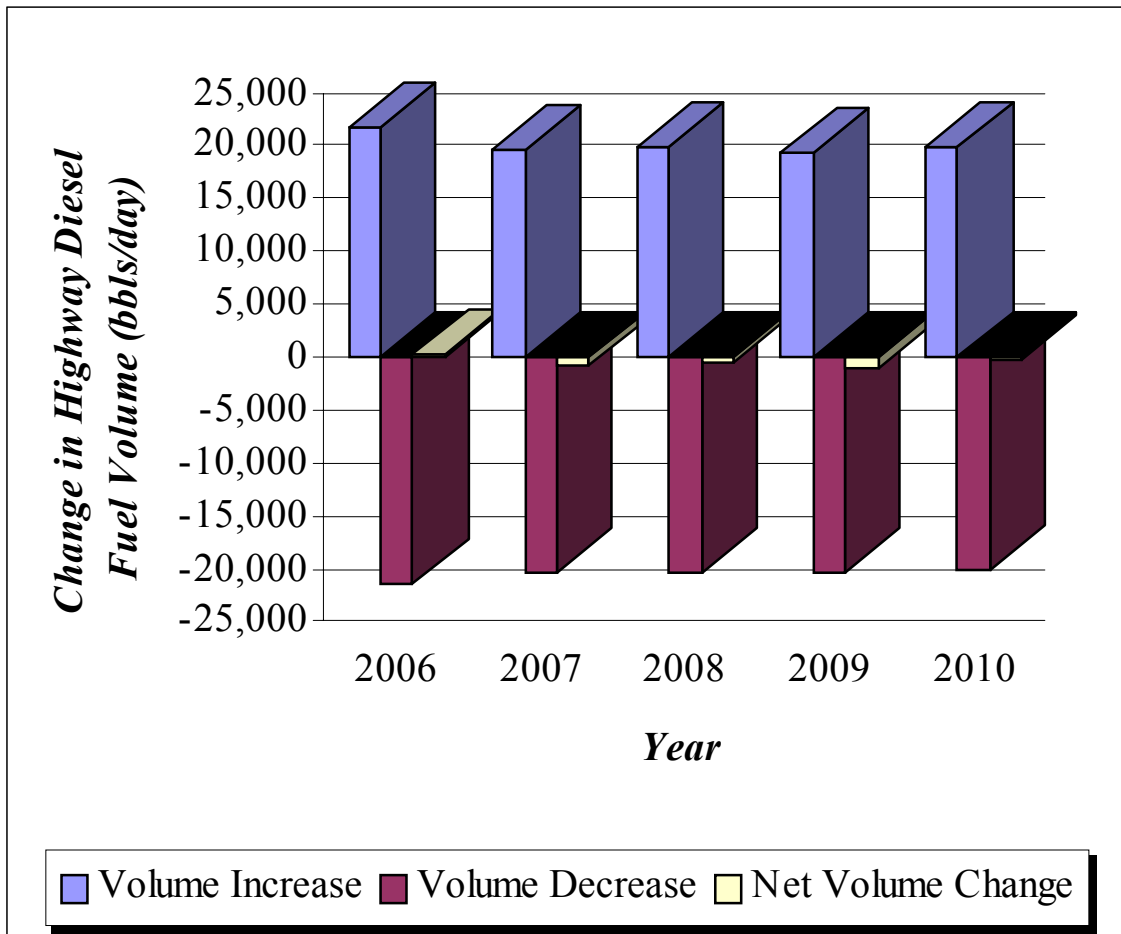


Figure 15. PADD 4 Highway Diesel Fuel Volume Change vs. 2000

## II. Summary Statistics - PADD Analysis

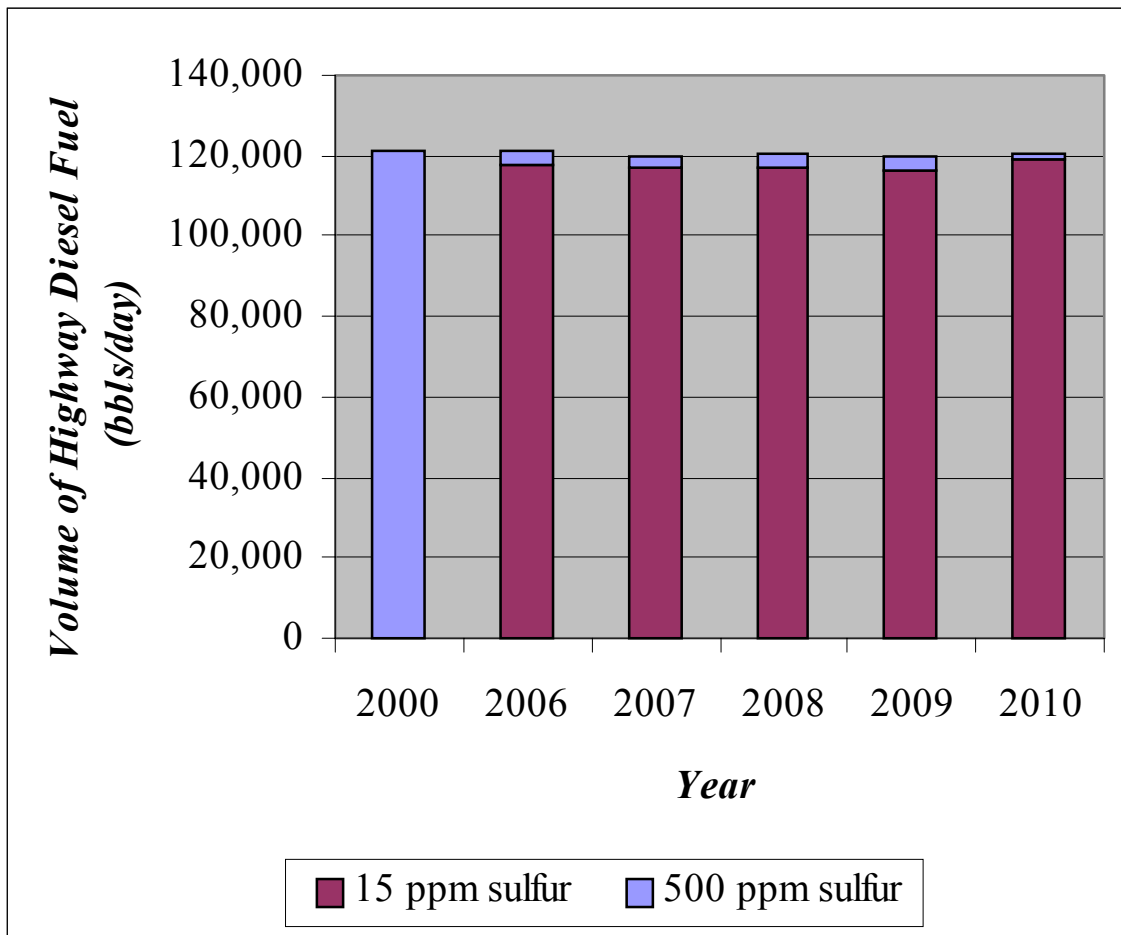
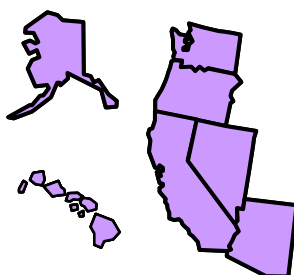


Figure 16. PADD 4 Projected Highway Diesel Fuel Production, 2006-2010

**5. PADD 5<sup>j</sup>**



*Number of Refineries*

Reported totals for all PADD 5 refineries are summarized in Tables 18 and 19, below. These tables show that in 2006, 22 refineries reported that they intend to produce a total volume of 418 thousand bbls/day of highway diesel fuel, 19 of which will be producing 100 percent of their highway diesel fuel at the 15 ppm sulfur standard. Furthermore, in 2006, two refineries expect to shift into the highway market, and one additional refinery will enter the market in 2007. In comparison, the 2003 pre-compliance reports only projected an increase of 351 thousand bbls/day with 16 refineries producing 100 percent of their highway diesel fuel at the 15 ppm sulfur standard. Only one refinery reported in its 2003 pre-compliance report that it would be entering the highway diesel market in 2006.

*Highway Diesel Fuel Production*

Seventeen refineries reported that they intend to produce more highway diesel fuel for 2006 than they did in 2000, including the two refineries that will be shifting into the highway diesel market in 2006. This will increase to 20 refineries increasing production over the duration of the TCO. Seven refineries intend to produce less highway diesel fuel in 2006 than they did in 2000, including two refineries that intend to shift out of the highway diesel fuel market. However, by 2010, only five refineries anticipate producing less highway diesel fuel than they did in 2000.

As shown in Figure 17, below, the 17 refineries planning to increase their highway diesel fuel production in 2006 reported a cumulative increase in their highway diesel fuel production volume of approximately 92 thousand bbls/day, and the five refineries planning to produce less highway diesel fuel in 2006 than they did in 2000 reported a cumulative decrease in their highway diesel fuel production volume of 25 thousand bbls/day. This results in a net increase in production of nearly 67 thousand bbls/day. In 2010, the net projected increase in production rises to 72 thousand bbls/day.

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<sup>j</sup> While the Summary and Analysis of the 2003 pre-compliance reports did not include the six refineries located in Alaska, we have included them in the analysis for 2004. Based on the pre-compliance reports that we received, some refineries in Alaska are planning to produce some 15 ppm sulfur diesel fuel beginning in 2006. Other refineries are still evaluating, but likely will elect to supply highway diesel fuel from refineries which may be located outside of Alaska.

## **II. Summary Statistics - PADD Analysis**

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### *Availability of 15 ppm Sulfur Highway Diesel Fuel*

As shown in Table 19, below, in 2006, over 409 thousand bbls/day, or 98 percent of the PADD 5 total, are anticipated to be 15 ppm sulfur highway diesel fuel. Only 10 thousand bbls/day are expected to be 500 ppm sulfur highway diesel fuel. The percentage of highway diesel fuel at the 15 ppm sulfur standard is expected to increase to over 99 percent of the total volume of highway diesel fuel produced in PADD 5 in 2010. significant increase in projected production of highway diesel fuel over the duration of the TCO.

### *Credit Generation and Use*

The reports for PADD 5 projected that for 2006, credit generation will likely total approximately 16 thousand bbls/day. On the other hand, no credits are expected to be used in PADD 5 during the TCO.

**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

<b>Table 18.</b>						
<b>PADD 5 Highway Diesel Fuel Refinery Statistics 2006-2010</b>						
<b>Year</b>	<b>2003</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
# refineries producing highway diesel fuel	22	22	23	23	23	23
# refineries at 100% 15 ppm		19	20	20	20	21
# refineries at 100% 500 ppm	22	1	1	1	1	1
# refineries with 15/500 ppm mix		2	2	2	2	1
# refineries increasing production (vs. 2003)		17	20	19	20	20
# refineries shifting into the highway market		2	3	3	3	3
# refineries decreasing production (vs. 2003)		7	5	6	5	5
# refineries shifting out of the highway market		2	2	2	2	2
# refineries generating credits		7	8	8	8	
# refineries using credits		0	0	0	0	0

<b>Table 19.</b>						
<b>PADD 5 Highway Diesel Fuel Volume and Credit Statistics 2006-2010</b>						
<b>Year</b>	<b>2000</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Total 15 ppm ( <i>bbls/day</i> )		408,510	417,190	423,812	421,239	422,985
Total 500 ppm ( <i>bbls/day</i> )	351,442	9,677	9,674	9,834	9,713	1,360
Total 15 + 500 ppm ( <i>bbls/day</i> )	351,442	418,187	426,864	433,646	430,951	424,345
Net volume change vs. 2000 ( <i>bbls/day</i> )		66,745	75,422	82,204	79,509	72,903
% change from 2000 highway volume		19.0	21.5	23.4	22.6	20.7
% 500 of total 15 + 500 ppm	100.0	2.3	2.3	2.3	2.3	0.3
Credit generation ( <i>bbls/day</i> )		16,540	18,179	18,006	17,991	
Credit usage ( <i>bbls/day</i> )		0	0	0	0	0

## II. Summary Statistics - PADD Analysis

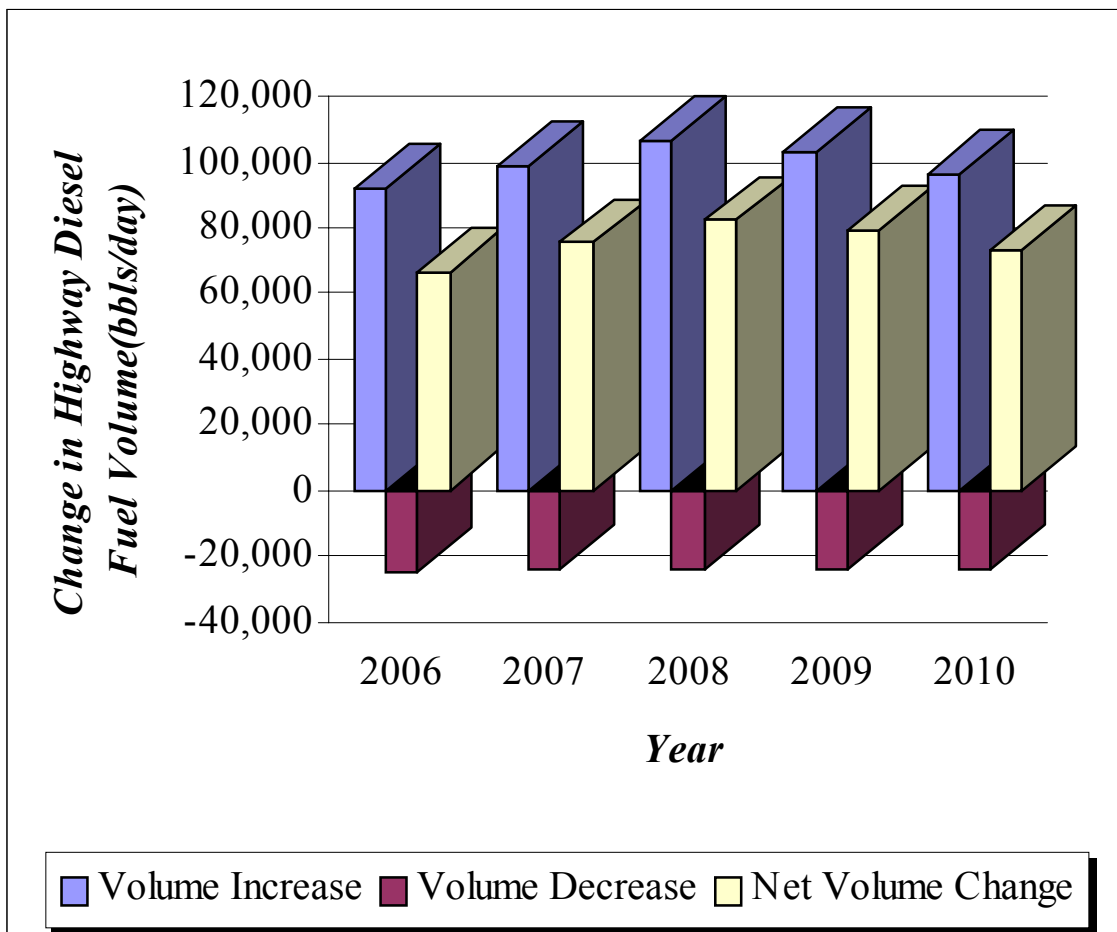


Figure 17. PADD 5 Highway Diesel Fuel Volume Change vs. 2000

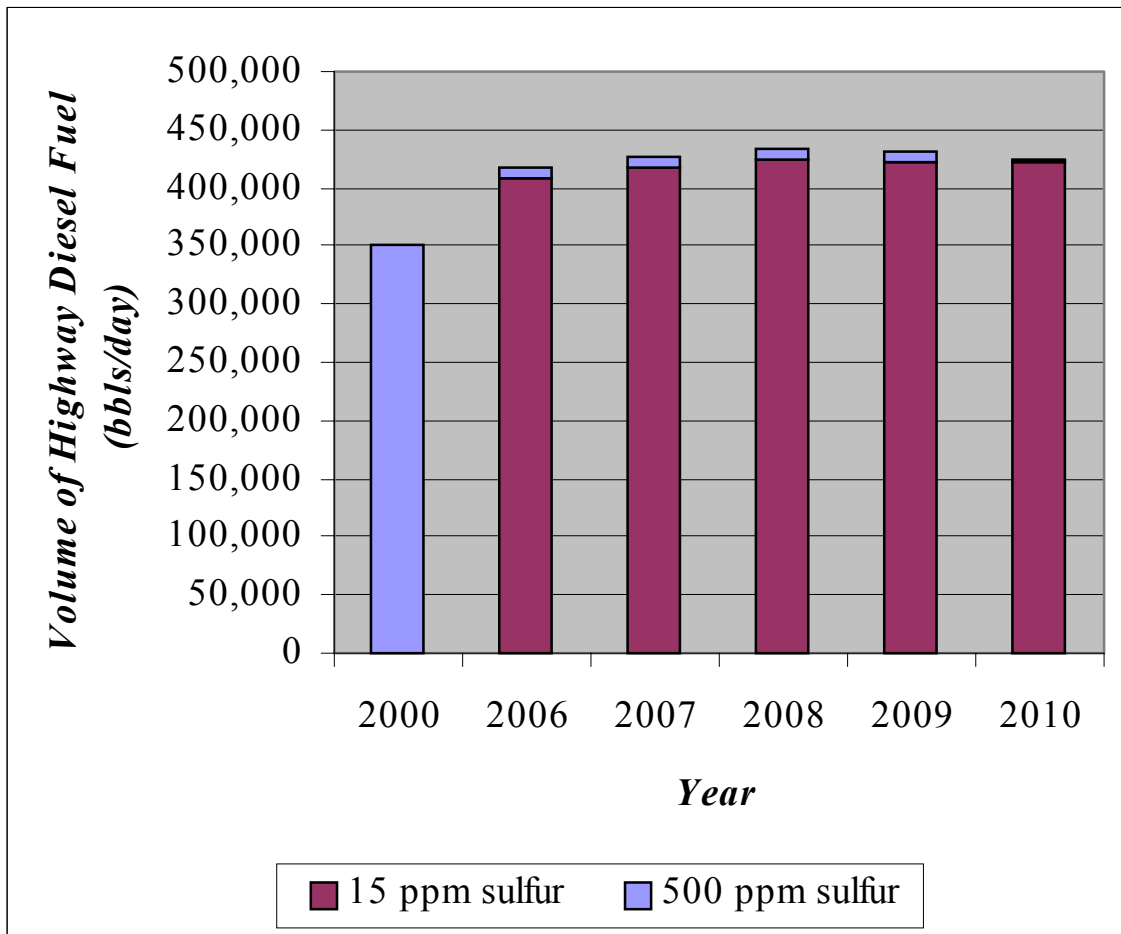


Figure 18. PADD 5 Projected Highway Diesel Fuel Production, 2006-2010

**Appendix: List of Acronyms**

AEO	<i>Annual Energy Outlook</i>
bbls/day	<i>barrels per day</i>
bpcd	<i>barrels per calendar day</i>
EIA	<i>Energy Information Administration</i>
EPA (or, “the Agency”)	<i>U.S. Environmental Protection Agency</i>
FR	<i>Federal Register</i>
GPA	<i>Geographic Phase-in Area</i>
PADD	<i>Petroleum Administrative Districts for Defense</i>
ppm	<i>parts-per-million</i>
TCO	<i>Temporary Compliance Option</i>



**Summary and Analysis of the Highway Diesel Fuel 2004 Pre-compliance Reports – September 2004**

## References

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