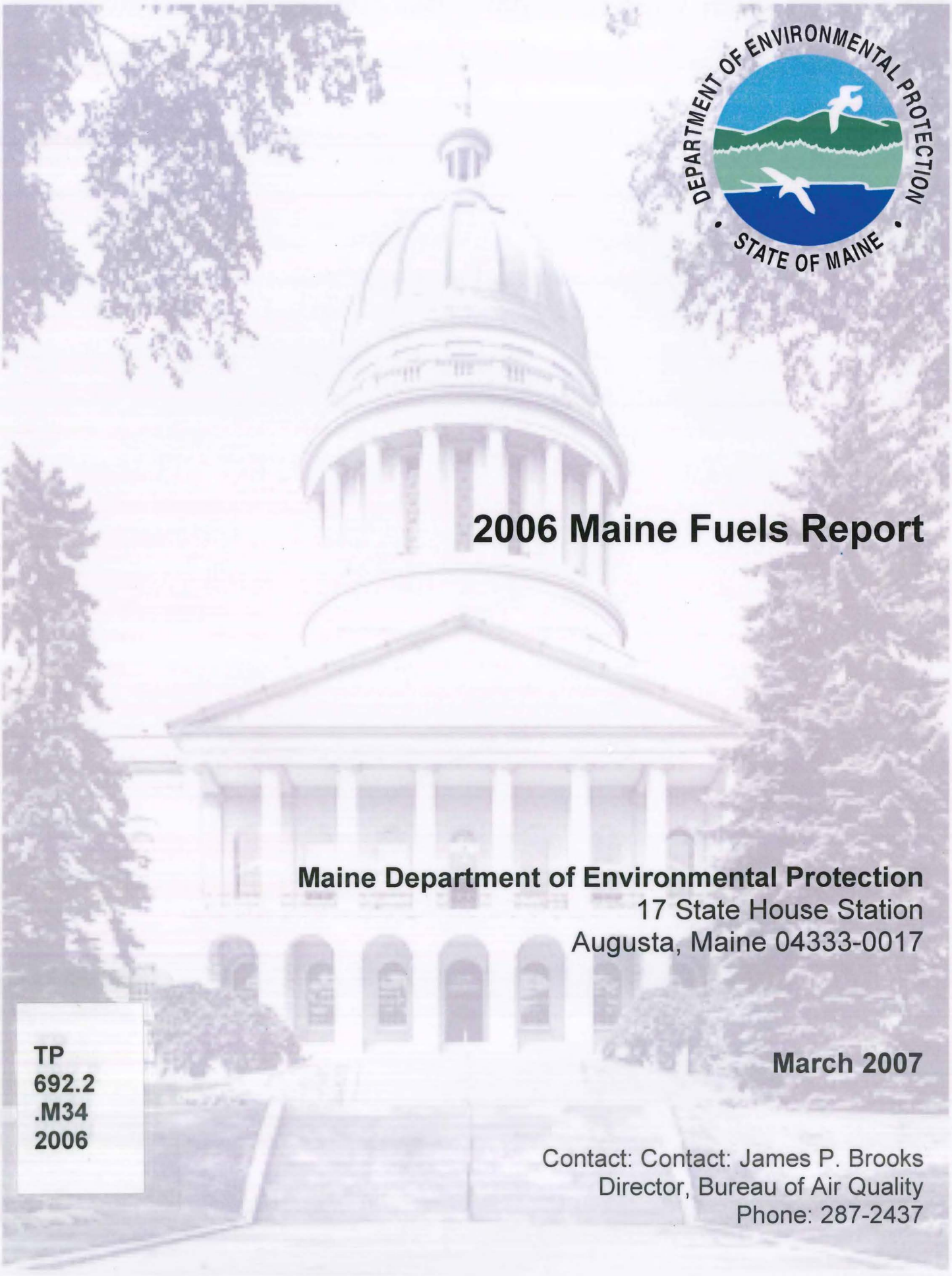

2006 Maine Fuels Report

Maine Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017

March 2007

Contact: Contact: James P. Brooks
Director, Bureau of Air Quality
Phone: 287-2437

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

May 8, 2007

Senator John Martin, Co-Chair
Representative Theodore Koffman, Co-Chair
Members of the Natural Resources Committee
State House Room 437
Augusta, ME 04333

Dear Senator Martin, Representative Koffman, and members of the Joint Standing Committee on Natural Resources

Please find enclosed "***2006 Maine Fuels Report***" prepared by the Department of Environmental Protection pursuant to38 M.R.S.A Section 585-H enacted by the Maine Legislature in 2000. Our 2006 *Fuels Report* shows a significant decrease in MTBE levels in response to the MTBE ban that went into effect on January 1, 2007.

The average level of methyl tertiary butyl ether (MTBE) in gasoline has declined from 2.07 percent by volume last year to 0.30 percent by volume MTBE and from 0.39 percent oxygen by weight to 0.06 percent oxygen by weight.

DEP staff is available at your convenience to present this report to the Committee and answer any questions you may have.

Sincerely;

Deborah N. Garrett
Deputy Commissioner

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 760-3143

web site: www.maine.gov/dep

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Section I: Executive Summary

Background. The Department of Environmental Protection (DEP or Department) submits this report in accordance with Maine Revised Statutes Title 38, Section 585-H, enacted by the Maine Legislature in 2000. At that time, the Legislature established the goal to virtually eliminate methyl tertiary butyl ether (MTBE) in gasoline sold in the state by January 1, 2003. MTBE is a member of a group of chemicals commonly known as fuel oxygenates added to conventional fuel to increase its octane. Oxygenates were added to Reformulated Gasoline (RFG) to increase the level of oxygen to reduce emissions and improve overall combustion efficiency. During the second special session of the 121st Legislature in 2004, Section 585-H was revised and Section 585-I enacted to reflect a statewide ban on MTBE beginning on January 1, 2007. Under the MTBE ban, gasoline may contain up to ½ of 1 percent (0.005) MTBE, so it is expected that, in the future, there may be some trace levels of MTBE in the fuel. DEP is required to monitor and report on levels of MTBE in shipments of gasoline to storage terminals in Maine. The Department is also required to work collaboratively at a regional level to develop alternatives to the use of MTBE as a gasoline additive.

Although some shipments of gasoline to Maine still contained MTBE concentrations, the levels dropped to zero and near-zero levels (undetectable levels) in 2006 in many deliveries. These reported concentrations of MTBE levels are a significant decrease from RFG which was required in Maine from 1995 to 1999, and last year's reported levels.

Maine began participating in the federal RFG program in January 1995 as part of the state's plan to comply with the federal Clean Air Act Amendments (CAAA) of 1990. The RFG delivered in Maine contained higher levels of MTBE than gasoline sold here prior to implementing the program. Subsequent to the RFG program, MTBE (which is very water soluble) began appearing in public and private water supplies more frequently and at higher concentrations than had been reported in prior years.

This prompted Maine to petition the United States Environmental Protection Agency (EPA) to allow the state to opt-out of the RFG program based on the risk to ground water posed by MTBE. EPA approved the petition provided that several conditions were met, including implementation of a replacement fuel program that achieved reductions of certain volatile organic compound air emissions. The Maine Board of Environmental Protection adopted Chapter 119 *Motor Vehicle Fuel Volatility Limit*, which required "7.8 Reid Vapor Pressure (RVP)" gasoline to be used in Maine's seven southern counties from May 1st to September 15th of each year to address this EPA requirement. Having met the EPA conditions, the effective date for withdrawal from the RFG program was March 10, 1999. In May of 2001, the Department submitted a fuels waiver request for 7.8 RVP fuel under the authority of Section 211 (c) of the Clean Air Act. The waiver received final EPA approval on March 6, 2002 and became effective on April 5, 2002.

After switching from RFG, MTBE levels in gasoline dropped to levels sold in Maine prior to initial implementation of the RFG program. Under the RFG program, the MTBE

levels were typically 11% by volume compared to pre-RFG levels of MTBE which were typically 2 to 3 % by volume in regular grade gasoline.

2006 MTBE Fuel Results. In 2006, the MTBE levels dropped to, in many cases, undetectable levels in conventional gasoline. The levels of MTBE significantly decreased from last year's average of 2.07% by volume to 0.30% by volume for 2006. After the 1st quarter of 2006, the average shipment of fuels contained 0% oxygen by weight. In comparison, RFG contains at least 2% oxygen by weight. In 2005, 35 of 307 shipments contained 2% oxygen by weight compared to 3 out of 315 shipments containing 2% oxygen by weight in 2006.

2006 Fuel Component Levels. The DEP tracks the levels of other gasoline components including sulfur, benzene, and aromatics in addition to MTBE. In 2006, the average levels of benzene were 0.92% by volume which is higher than the levels of 0.81% by volume reported in 2005. The number of shipments with benzene levels above the federal cap of 1% by volume tripled from previous years with a maximum level reported as high as 4.03% by volume. Benzene is a known human carcinogen and exposure to mobile source air toxics emissions is a major concern to health officials and air quality regulators in the Northeast. (**Air toxics** refers to a very broad group of air pollutants that, in sufficient concentration, could cause serious health effects to people breathing air that contains them)

Average aromatic levels went up from 28% by volume in 2005 to 31% by volume in 2006. The number of shipments of aromatics with concentrations greater than 40% by volume increased 6 fold with a maximum level as high as 70% by volume. (**Aromatics** are hydrocarbons that are high octane blending components of gasoline.)

Sulfur levels in 2006 decreased from the weighted average of 88.97 parts per million (ppm) in 2005 to 36.46 ppm in 2006. The significant decrease in gasoline sulfur is a direct result of federal law requiring the reduction of sulfur in gasoline. Sulfur is the largest contributor to particulate matter pollution (PM_{10} and $PM_{2.5}$ are known lung irritants and contributors to breathing problems such as asthma)

See Table 1 for a summary of all 2006 gasoline component concentrations.

Sulfur levels in # 2 Home Heating Oil. In January 2006 the Department began tracking the sulfur levels in #2 home heating oil. The purpose of the initial data collection was to establish a sulfur baseline in home heating oil prior to the phase in of Ultra Low Sulfur Diesel (ULSD) (80% of On-road diesel must be ULSD at retail facilities by October 15, 2006 with the off-road diesel becoming ULSD beginning June of 2010 at refineries). During Calendar year 2006 the sulfur levels in home heating oil ranged from a low of 350 ppm to a high of 7620 ppm. Sulfur levels in 2006 remained consistent with levels averaging 2387 ppm in the first quarter; 2643 ppm in the second quarter, 2468 ppm in the third quarter and 2441 ppm in the fourth quarter with a year round average of 2462 ppm..

Maine's MTBE Ban Status. In response to the state MTBE ban, MTBE levels began a steady and marked decrease in 2006. In the first quarter many of the shipments were typical of those seen in past years at 1.33 percent by volume but in the second quarter of 2006 the levels of MTBE dropped significantly to 0.031 percent by volume of MTBE. The third and fourth quarters also showed a decline to 0.008 percent by volume respectively.

Federal Fuel Update. As part of an initiative to address the high fuel prices, the President directed the EPA administrator to invite the Governors of all 50 states (or their representatives) to participate in a task force to review the various requirements related to fuels. The task force's report was submitted to the President in June of 2006 In addition, section 1541(c) of the Energy Policy Act of 2005 (EPAct) required the Environmental Protection Agency (EPA) and the Department of Energy (DOE) to submit a report to Congress on the impact of state fuel programs approved under Section 211 (c)(4)(c). The final EPA and DOE report was issued in December 2006. A summary of the findings and recommendations of both reports are included in Section V of this report.

Another Federal action on fuels was the introduction of Ultra Low Sulfur Diesel (ULSD). Beginning on October 15, 2006, Federal regulation requires that 80% of the nation's on-road diesel fuel sold at retail will have a sulfur level of 15 ppm. EPA recently stated that 90 percent of diesel fuel available for retail sale is ULSD but found that 76 percent of the fuel pump labels have not been updated since the rule took effect on October 15, 2006.

Finally in 2006, EPA issued a notice of proposed rulemaking on the Renewable Fuels Standard. This standard, originally included in Section 1501 of the Energy Policy Act of 2005 (EPAct), established a requirement that the nation's fuel contain specific volumes of renewable fuels and established those volumes for the years 2006 through 2012. The rulemaking is not yet finalized, but EPA expects to complete it by early 2007.

All fuels data compiled for this report can be found on the internet at the DEP website at www.maine.gov/dep/air/mobile/fuelspage.htm.

Table 1: 2006 Data Summary of Gasoline Component Concentrations

Weighted Average for	RVP (psi)	Oxygen (wt %)	MTBE (%vol)	Other Oxy-genate (% vol) TAME[1]	Other Oxy-genate (% vol) ETBE[2]	Other Oxy-genate (% vol) TBA[3]	Other Oxy-genate (% vol) N-Prop.[4]	Other Oxy-genate (% vol) DIPE[5]	Other Oxy-genate (% vol) Ethanol[6]	Other Oxy-Genate (% vol) Iso-Prop.[7]	Ben-zene (% vol)	Aro-matics (%vol)	Sulfur (ppm)
1st Quarter	13.11	0.25	1.33	0.19	0.16	0.10	0.97	0.00	0.00	0.00	0.77	25.30	16.55
2nd Quarter	8.16	0.01	0.03	0.00	0.00	0.11	0.00	0.04	0.00	0.00	1.06	34.66	34.6
3rd Quarter	8.74	0.00	0.01	0.01	0.00	0.00	0.00	0.08	0.01	0.00	1.01	32.82	36.83
4th Quarter	12.26	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.03	0.82	28.29	44.89
Ozone Season	8.10	0.00	0.01	0.01	0.00	0.00	0.00	0.04	0.01	0.00	1.07	34.21	37.41
Full Year	10.37	0.06	0.30	0.11	0.10	0.10	0.97	0.04	0.01	0.03	0.92	30.60	36.46

[1] Tertiary Amyl Methyl Ether or TAME is an oxygenate used in fuel to increase octane or oxygen levels and is used in place of or together with MTBE
[2] Ethyl Tertiary Butyl Ether or ETBE is an oxygenate used in fuel to increase octane or oxygen levels and is used in place of or together with MTBE
[3] Tertiary Butyl Alcohol or TBA is an oxygenate used in fuel to increase octane or oxygen levels and is used in place of or together with MTBE
[4] 1-propanol propyl alcohol or n-propanol is an oxygenate used in fuel to increase octane or oxygen levels and is used in place of or together with MTBE
[5] Diisopropyl Ether or DIPE is an oxygenate used in fuel to increase octane or oxygen levels and is used in place of or together with MTBE
[6] Ethyl Alcohol (ETOH) or Ethanol is an oxygenate used in fuel to increase octane or oxygen levels and is used in place of MTBE. MTBE and Ethanol should not be mixed together in tanks due to volatility issues.
[7] Isopropanol is an oxygenate used in fuel to increase octane or oxygen levels and is used in place of or together with MTBE

Section II: Introduction

A. Background

The federal reformulated gasoline (RFG) program was designed to reduce emissions of motor vehicle pollutants. To comply with the RFG program, gasoline must achieve a set of emission performance standards and until the Energy Policy Act of 2005 (EPAct 2005) removed the requirement, was required to meet a minimum oxygen content. In RFG oxygen was added to the fuel to make it burn more completely and reduce the amount of unburned fuel released out the tailpipe thereby reducing emissions Refiners had opted to comply with the oxygen requirement by selling RFG containing methyl tertiary-butyl ether (MTBE) at 11 percent by volume. In comparison, conventional gasoline has MTBE in amounts of 2-3 percent by volume or less, while some premium blends can contain as much as 9 percent MTBE prior to the start of the RFG program. ('Conventional gasoline" is the standard gasoline recipe that has no oxygenate requirements and comes in three blends: regular (87 octane) mid-grade (90 octane) and premium (93 octane))

MTBE is a gasoline additive that had replaced lead as an octane enhancer since 1979. MTBE is a member of a group of chemicals commonly known as fuel oxygenates added to conventional fuel to increase its octane. Oxygenates were added to RFG to increase the level of oxygen in order to reduce emissions and improve overall combustion efficiency. MTBE was used in gasoline throughout the United States to reduce carbon monoxide (using a wintertime oxy-fuel) and ozone levels (using RFG) caused by auto emissions.

In 1991 Maine volunteered to phase into the RFG program and began selling RFG in January of 1995. States with voluntary RFG programs were required to decide by December 30, 1997, whether they wanted to remain in the program, otherwise procedures required them to stay in the program through 2003.

With the distribution of RFG in southern Maine, there was public concern over the potential threat to ground water quality. MTBE is more water soluble than other gasoline components and is persistent in ground water. MTBE is considered by the United States Environmental Protection Agency (EPA) as a Class C possible carcinogen and has a very low odor and taste detection threshold.

In 1997, the Maine Bureau of Health reported MTBE in 7% of Maine's public water supplies. These incidents of groundwater contamination prompted Governor King to direct a ground water investigation to determine the extent of MTBE in public and private water supplies. Maine did not want to commit to continued participation in the RFG program through the year 2003 until the ground water testing was completed. In *The Presence of MTBE and Other Gasoline Compounds in Maine's Drinking Water* report (1998), MTBE was reported to be detected in approximately 16% of the public water supplies and 951 private wells sampled in Maine at the 1 part per billion (ppb) detection limit.

As a result of this study, in October 1998 Maine petitioned EPA under 40 CFR 80.72(a) to opt-out of the RFG program based on the unacceptable risk to ground water posed by MTBE. A subsequent waiver request was submitted to EPA requesting approval for a 7.8 Reid Vapor Pressure (RVP) fuel rather than the 7.2 RVP fuel adopted by the Board of Environmental Protection (BEP). The DEP had initially requested that the BEP adopt a replacement fuel with a 7.2 RVP, but concerns about potential fuel supply issues caused the DEP to use a fuel already produced for other parts of the country and readily available. The request for the 7.8 fuel was approved despite the increase in volatile organic compounds (VOC) emissions for 7.8 RVP fuel. EPA approved the petition and the effective date for withdrawal from the RFG program was March 10, 1999.

The Department anticipated that if RFG levels for MTBE (eleven percent by volume) were not required, then the levels of MTBE would drop to the levels for conventional gas sold in Maine prior to participation in the RFG program. However, the Department also anticipated MTBE would not be totally eliminated since the petroleum industry continued to rely on MTBE as an octane enhancer in gasoline fuel production.

At the direction of the 120th legislature, the DEP collects data on gasoline sold in Maine to determine MTBE levels. The DEP tracks not only the levels of MTBE but also other gasoline components including sulfur, benzene, and aromatics. The data collection was also intended to track the progress made towards the goal of eliminating MTBE in gasoline sold in Maine (the 120th Legislature also set an MTBE elimination date goal of January 2003). This goal was not met, and during the second special session of the 121st Legislature, MTBE was banned in gasoline fuels, beginning on January 1, 2007. As of this date no one may sell, offer for sale, distribute or blend in Maine gasoline containing more than ½ of 1% by volume MTBE

The State of Maine is also required under 38 M.R.S.A. §585-H, to promote and actively participate in regional efforts to develop alternatives of the use of MTBE as a gasoline additive. As a result of that requirement, the Northeast States for Coordinated Air Use Management (NESCAUM) completed a study in 2001 of the potential effects on public health and the environment, and on the regulatory and economic impacts of using ethanol as an oxygenate.

In 1999, a Northeast Regional Fuels Task Force was established at the direction of the New England Governors Association to look at regional solutions to address the MTBE issue. This Task Force's objectives were to maximize the air quality benefits and public health benefits of RFG, reduce the amount of MTBE in the gasoline supply to protect water resources, promote a regionally consistent clean fuels program, and to minimize the impact of fuel quality changes on gasoline supply and price.

For the past several years, this task force worked with the petroleum and ethanol industries and environmental groups to forge a compromise on a Congressional bill that would phase in the elimination of MTBE and require a national fuel with a renewable content requirement with clean air performance benefits. The Energy Policy Act of 2005

passed without a ban on MTBE, but did include a renewable fuels standard as well as removing the oxygenate requirement from the RFG program. As a result of the removal of the fuel oxygenate requirement and the state bans on MTBE, 10% ethanol has replaced MTBE in RFG to maintain the air quality improvements.

B. Legislative Requirement

38 M.R.S.A. §585-H, enacted by the Legislature in 2000, requires MTBE monitoring and reductions. This section was amended in 2004 to reflect a ban on MTBE. Specifically the law now reads:

"The department shall monitor shipments of gasoline to storage terminals in this State and compile annual reports showing the levels of methyl tertiary butyl ether, referred to as "MTBE", in gasoline brought into this State.

1. *The department shall promote and actively participate in regional efforts by state regulatory agencies in the Northeast to develop alternatives to the use of MTBE as a gasoline additive*

The department shall annually, no later than February 1st of each year, present a report to the joint standing committee of the Legislature having jurisdiction over natural resources matters on the levels of MTBE in gasoline brought into this State. The committee may report out to any session of any Legislature legislation relating to MTBE use in gasoline."

38 M.R.S.A §585-I was enacted as follows:

"The following provisions apply to the sale of MTBE in the State.

1. *Definition. For purposes of this section, "MTBE" means the gasoline oxygenate methyl tertiary butyl ether.*

2. *Prohibition on sale. Beginning January 1, 2007, a person may not sell, offer for sale, distribute or blend in this State gasoline that contains more than ½ of 1% by volume MTBE that is intended for sale for ultimate consumers in this State."*

3. *Emergency order. Notwithstanding subsection 2, whenever the commissioner finds that a danger to public health or safety exists due to low supply of gasoline in the State, the commissioner may issue an emergency order waiving the sales prohibition in subsection 2.*

C. Clean Air Act 211 (c) Waiver

Following the 1990 Clean Air Act (CAA) Amendments, Governor John McKernan, Jr. opted Maine's non-attainment counties[8] into the federal RFG program on June 26, 1991. The sale of reformulated gasoline began on January 1, 1995.

On October 13, 1998, Governor King sent a letter to EPA requesting permission to opt-out of the RFG program. EPA approved the request to opt-out, with March 10, 1999 as the effective date, contingent upon three conditions being met by the Department. Those conditions were as follows: (1) Maine identifies a replacement fuel measure or other measure to provide VOC reductions equivalent to those yielded by RFG; (2) Maine provide a schedule for implementing the replacement measure; and (3) Maine provide an explanation of the impact to the State Implementation Plan (SIP).[9](The SIP is the federally enforceable plan for Maine which identifies how it will attain and/or maintain the primary and secondary National Ambient Air Quality Standards.)

To meet the first condition, on March 14, 1999, the Maine BEP amended Chapter 119 *Motor Vehicle Fuel Volatility Limit*, a conventional low volatility fuel regulation. This amended regulation required all gasoline to have a RVP no greater than 7.8 psi during the period between May 1, 1999 and September 15, 1999 and reduced to 7.2 psi during the period between May 1, 2000 and September 15, 2000 and continuing every year thereafter. This regulation applied to gasoline that is distributed or marketed by bulk gasoline terminals, or is directly imported to gasoline service stations or bulk gasoline plants in York, Cumberland, Sagadahoc, Androscoggin, Kennebec, Knox and Lincoln Counties. However, there was a concern that the limited number of refiners making 7.2 RVP fuel could result in a potential supply disruption. In the event of a major supply disruption, the most likely "replacement" fuel would be RFG with its required oxygen levels (i.e. 11% MTBE by volume). Due to continued concerns of potential groundwater contamination from MTBE, an oxygenate used in RFG, the risk of increased levels of MTBE in gasoline shipped to Maine was not acceptable. 7.8 RVP gasoline with no restrictions on oxygen levels resulted in MTBE levels equal to or below typical conventional gasoline (2 to 3% by volume). Therefore, on April 20, 2000 the Maine BEP amended Chapter 119 *Motor Vehicle Fuel Volatility Limit* to repeal the requirement that gasoline sold in the seven southern counties must have a RVP of 7.2 psi or less during ozone season.

In March of 1989 and June of 1990, EPA promulgated federal standards for the RVP levels of motor vehicle gasoline under sections 211(c) and 211(h) of the CAA. Section 211(c) (4) (A) of the CAA prohibits non-identical state regulation of fuel characteristics or components for which EPA has adopted a control or prohibition. In accordance with

[8] Hancock and Waldo counties were subsequently opted-out of the RFG program on December 28. 1994.
[9] On January 22, 1999 EPA extended the effective date of Maine's withdrawal from the RFG program until March 10, 1999 "in order to provide time for EPA and the State to reach agreement on such replacement program."

this Section, EPA may approve a non-identical state fuel control as a SIP provision, provided the state demonstrates that the measure is necessary to achieve the national primary or secondary ambient air quality standards that the plan implements. EPA can approve a state fuel requirement as necessary only if no other measure exists that would bring about timely attainment, or if other measures exist but are unreasonable or impracticable.

Maine, in accordance with Section 211 (c), submitted a fuels waiver request to EPA for a 7.8 RVP gasoline that was accepted on May 29, 2001. EPA subsequently published in the Federal Register on December 6, 2001 a proposal to approve the waiver and requested comments. The comment period ended on January 9, 2002 with no comments received. Final approval of the waiver was received on March 6, 2002 and became effective on April 5, 2002.

Section III: Data

A. Data Collection

In addition to the requirements of 38 MRSA § 585-H, Chapter 119 *Motor Vehicle Fuel Volatility Limit* requires the following records to be kept at the bulk gasoline terminals:

> *"Any owner or operator of a bulk gasoline terminal shall maintain records on the Reid Vapor Pressure, oxygen content, oxygenate, benzene, aromatics, and sulfur of any gasoline that is delivered to or distributed from such terminal. Such records shall be maintained for at least three years and shall be available for inspection during normal business hours, and copies shall be provided to the Commissioner or his representative upon request."*

The DEP requested the information listed above from each bulk gasoline terminal carrying automotive gasoline. A bulk gasoline terminal refers to a storage facility that has a daily average throughput of more than 20,000 gallons of gasoline.

In cooperation with the Maine Petroleum Association, the DEP developed a quarterly reporting form for the terminals to fill out and submit to the DEP. In addition to the various fuel components, the DEP requested the date of delivery, the number of barrels delivered, and other significant information.

Beginning January 1, 2006, in addition to the gasoline data, the Department also collected data from the terminals on the sulfur levels in #2 home heating oil sold in Maine. The Department modified the existing Chapter 119 reporting form to include sulfur.

The following bulk gasoline terminals reported automotive gasoline and/or #2 home heating oil (#2) data to the DEP:

Terminal	Location	Fuel Reported
Gulf	Portland	Gasoline
Irving	Bucksport	Gasoline/ #2
Exxon-Mobil	Portland	Gasoline/ #2
Citgo	Portland	Gasoline/ #2
Webber	Searsport	Gasoline/ #2
Sprague	Portland	#2
Global	Portland	#2

No data was obtained from any trucking of fuel into the state.

B. Maine Data on MTBE and Other Oxygenates

During the year 2006, gasoline contained 0.30 percent by volume MTBE and a 0.06 percent weighted average oxygen level (Table 2). 269 out of 315 shipments of gasoline reported no MTBE levels above the 0.02 % by volume (the analytical test detection level). When the oxygenate is listed as 0.00, it was not reported as an oxygenate for that year.

Table 2: MTBE & Other Oxygenates

Weighted Ave for:	Oxygen Wt %	MTBE Vol %	TAME[10] Vol %	ETBE[11] Vol %	MEOH[12] Vol %	Ethanol[13] Vol %	TBA[14] Vol %
2004 Data	0.91	4.49	2.08	2.40	0.04	0.13	0.40
2005 Data	0.39	2.07	0.54	0.46	0.09	N/A	0.20
2006 Data	0.06	0.30	0.11	0.10	N/A	0.01	0.10

Weighted Ave for:	Sec-butanol[15] Vol %	N-Propanol[16] Vol %	DIPE[17] Vol %	Iso-propanol[18] Vol %
2004 Data	N/A	0.16	0.81	N/A
2005 Data	0.05	N/A	2.86	N/A
2006 Data	N/A	0.97	0.04	0.03

As a reference, RFG requires a minimum oxygen level of 2 percent by weight in gasoline. For MTBE this equates to 11 percent by volume (no two oxygenates require the same percent volume to meet the required oxygen level). Conventional gasoline prior to RFG commonly contained between 2 to 3 percent by volume MTBE in regular grades and as much as 9 percent by volume in premium blends.

[10] TAME means Tertiary Amyl Methyl Ether
[11] ETBE means Ethyl Tertiary Butyl Ether
[12] MEOH means Methanol
[13] Ethanol means Ethyl Alcohol
[14] TBA means Tertiary Butyl Alcohol
[15] Sec-Butanol means sec butyl alcohol
[16] N-Propanol means N Propyl Alcohol
[17] DIPE means Diisopropyl Ether
[18] Iso Propanol means Isopropyl Alcohol

Table 3 summarizes the MTBE content in Maine fuel reported during 2006 compared to 2005 shipments.

Table 3: Shipment Summary

	2006	2005
Number of shipments of gasoline	315	307
Number of shipments with no oxygenates	250	64
Number of shipments with MTBE only	50	193
Number of shipments with MTBE plus other oxygenates	13	48
Number of shipments with an other oxygenate but no MTBE	2	4
Number of shipments with MTBE only with oxygen levels greater than 2% by weight	14	35
Number of shipments with oxygen levels greater than 2% by weight containing oxygenates other than MTBE alone	3	13

For all shipments of gasoline:	2006	2005
MTBE	0.30% by volume	2.07% by volume
Weighted average oxygen level	0.06% by weight	0.39% by weight

Overall, the levels of MTBE have dropped since the state withdrew from the federal RFG program and implemented a "low volatility" gasoline program starting in 1999.

Table 4 summarizes the other (non-MTBE) oxygenates in the Maine fuel reported during 2006.

Table 4: Other Oxygenates Reported

Oxygenate	Number of Shipments	Percent Oxygenate (by volume)
TAME	3	0.11
ETBE	2	0.10
Ethanol	1	0.01
TBA	6	0.10
N-propanol	1	0.97
DIPE	2	0.04
Iso-propanol	1	0.03

Figure 1 depicts the levels of MTBE in gasoline by quarters for 2004, 2005, and 2006. The levels of MTBE in gasoline decreased significantly in 2006 and were in line with meeting the January 1, 2007 MTBE ban.

Figure 2 is a scatter-diagram of the percent volume of MTBE by delivery date for 2006 and Figure 3 depicts the volume percent of MTBE for 2004, 2005, and 2006 by shipment. Figure 4 is a scatter-diagram of the percent weight oxygen by delivery date and Figure 5 shows the percent weight oxygen levels for 2004, 2005, and 2006 by shipment.

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Figure 1
% Vol MTBE by Quarter 2006

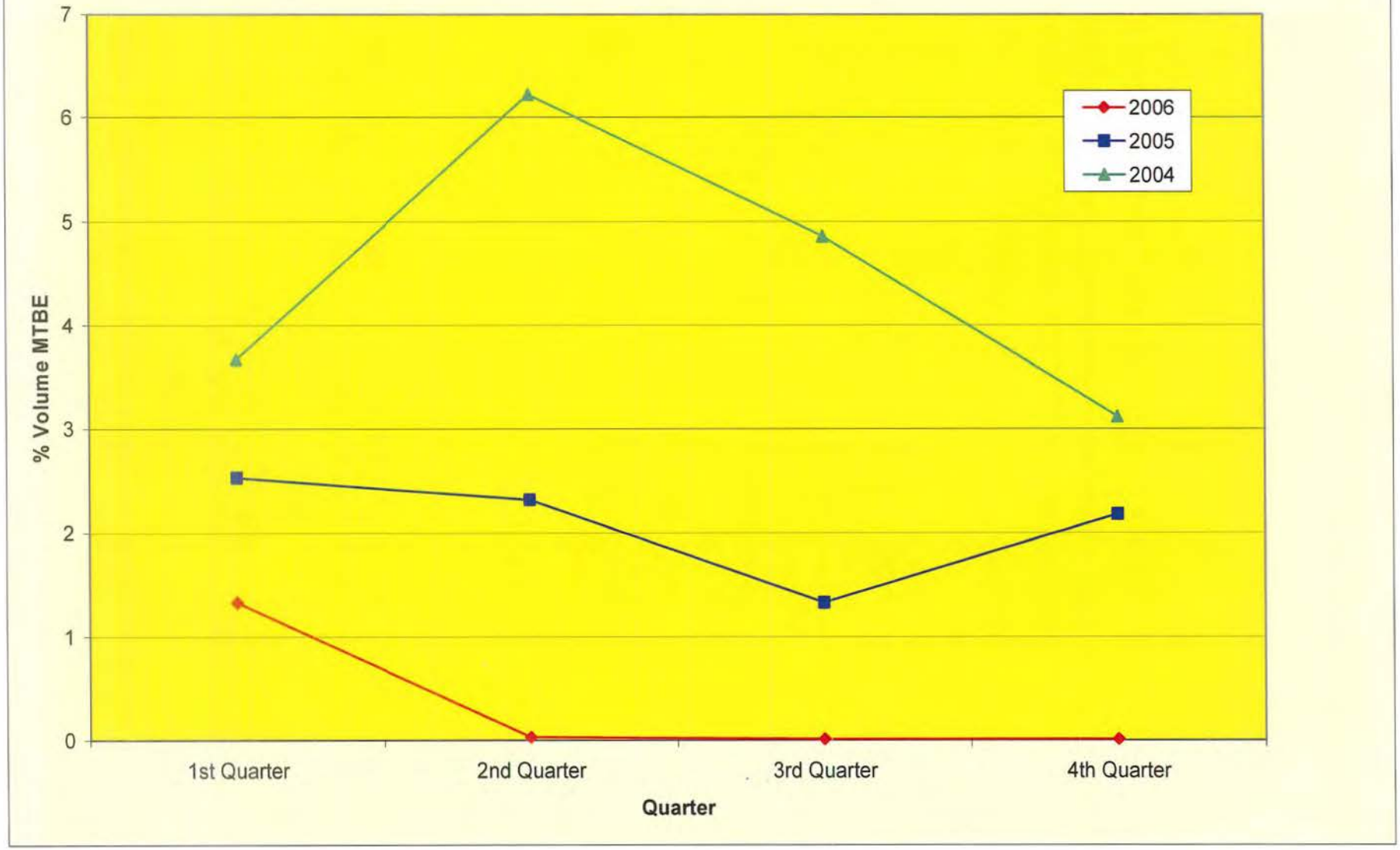
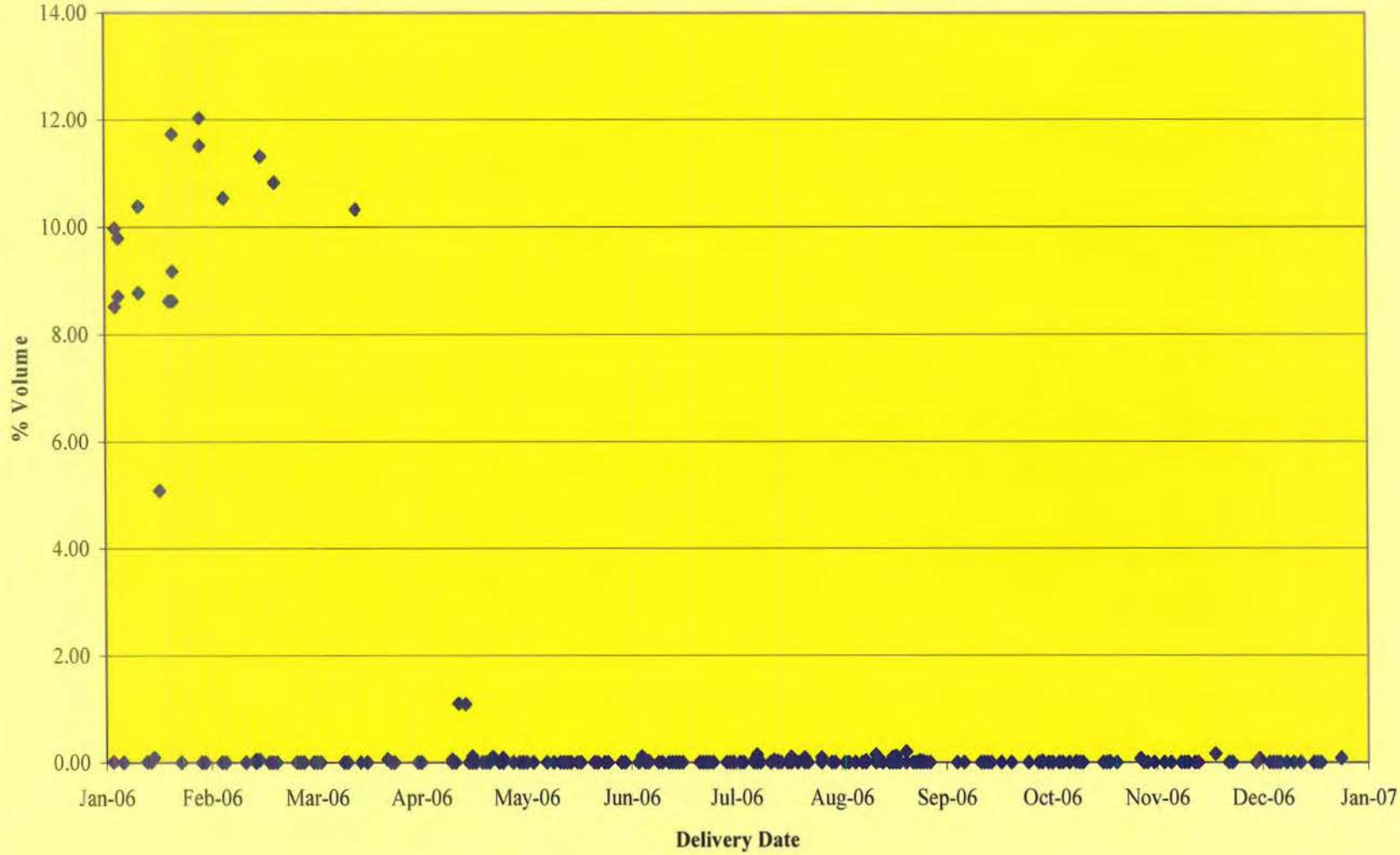


Figure 2
MTBE (% Vol) by Delivery Date 2006



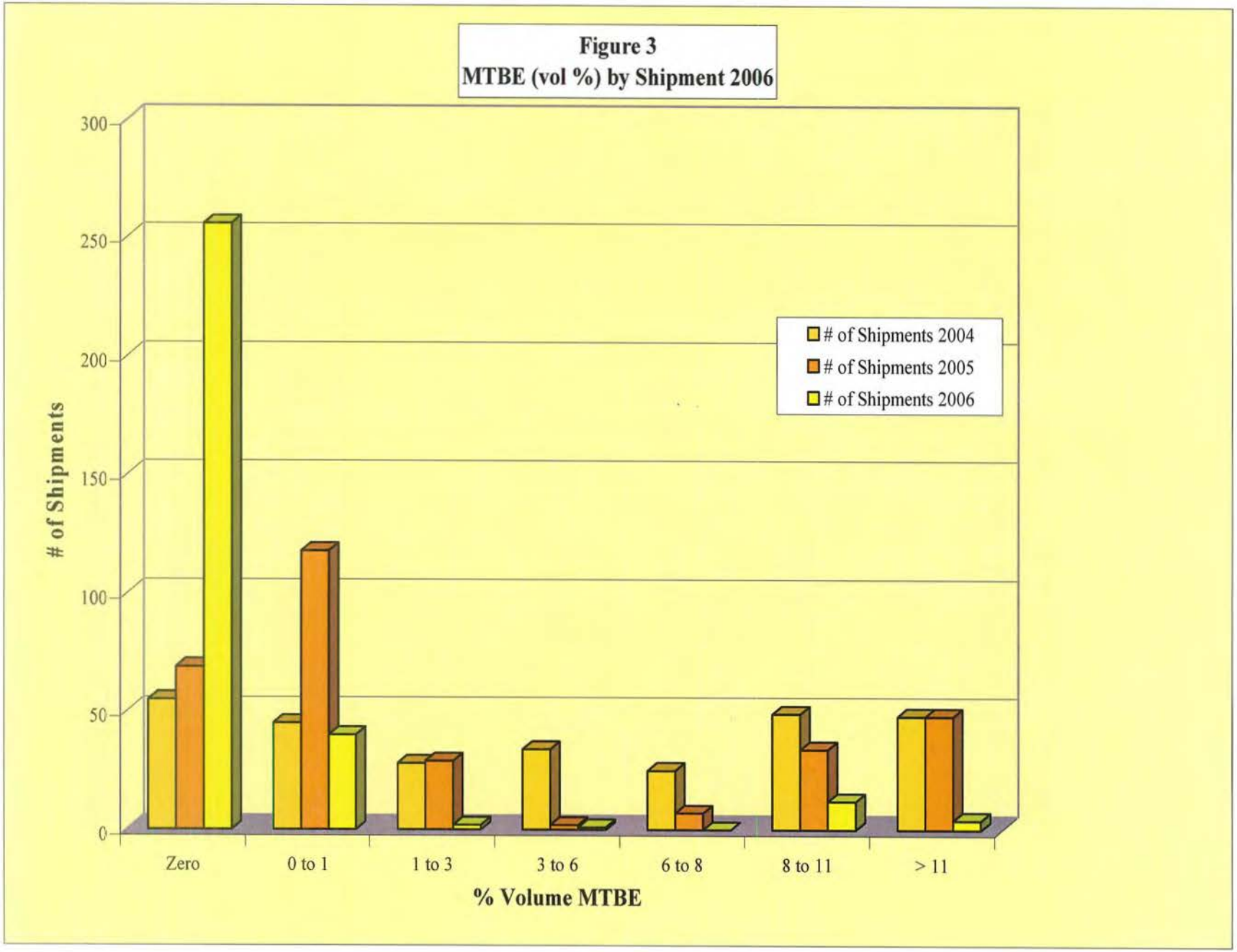
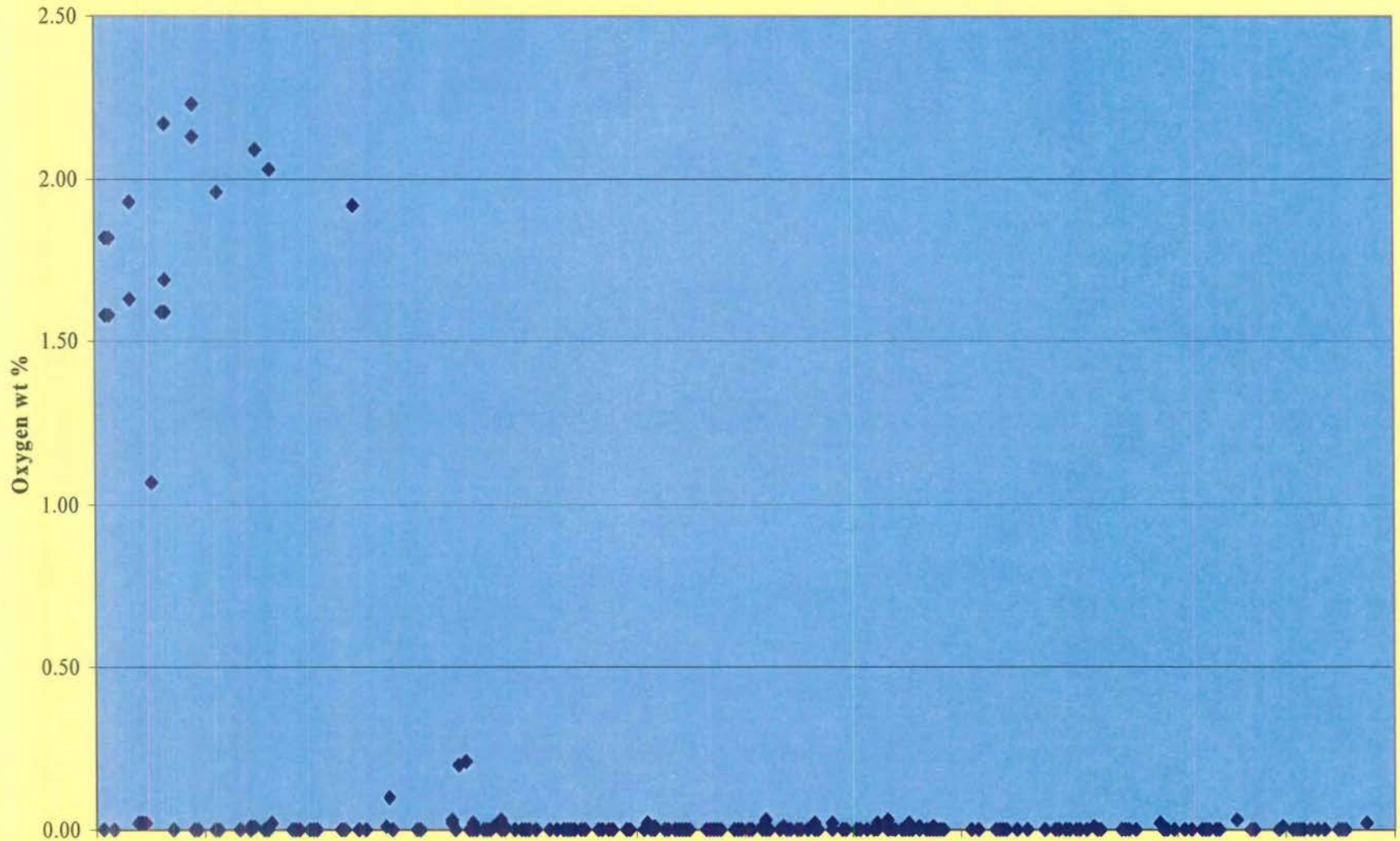


Figure 3
MTBE (vol %) by Shipment 2006
300
250
200
150
100
50
0
# of Shipments
# of Shipments 2004
# of Shipments 2005
# of Shipments 2006
Zero
0 to 1
1 to 3
3 to 6
6 to 8
8 to 11
> 11
% Volume MTBE

Figure 4
Oxygen (wt %) by Delivery Date 2006



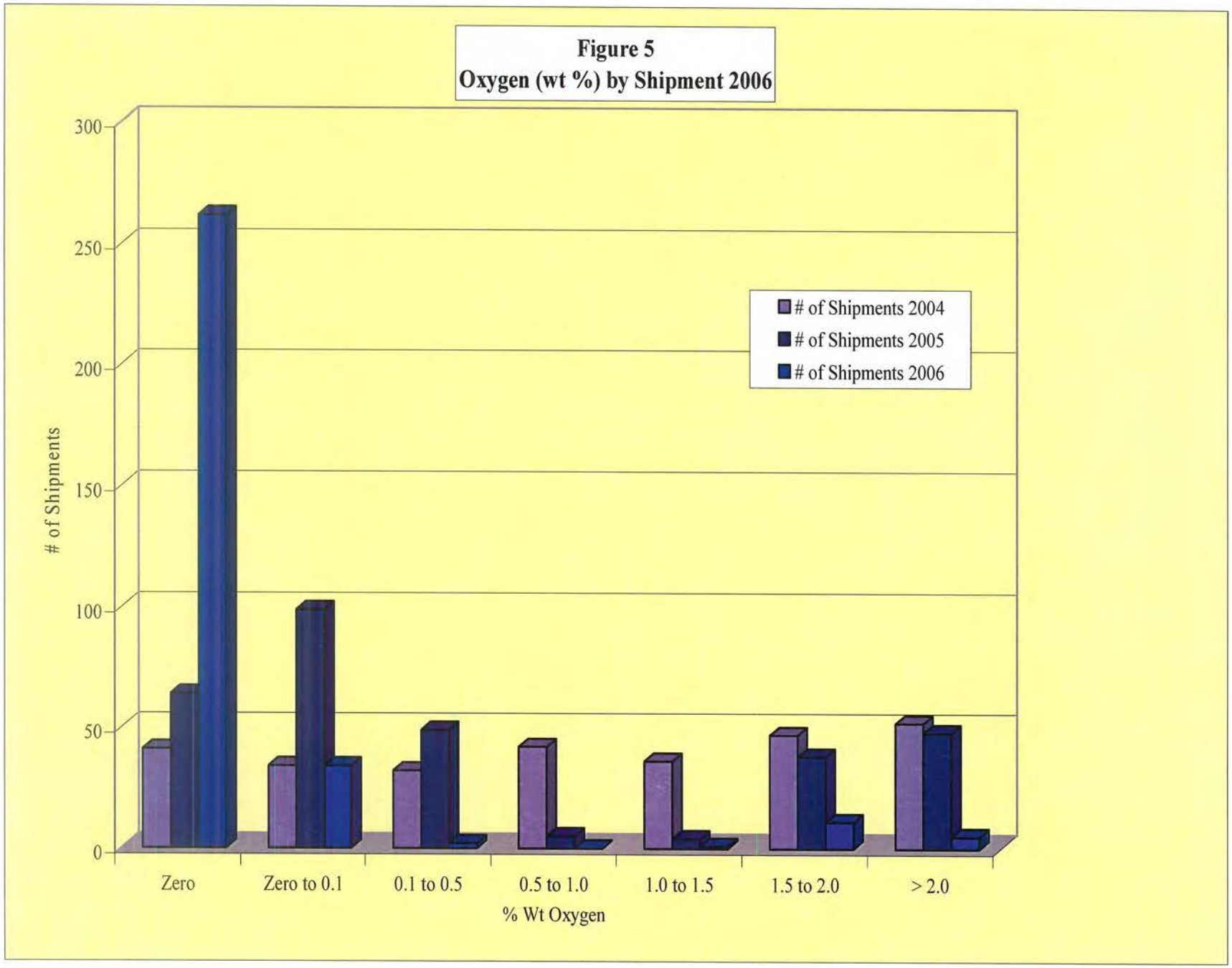


Figure 5
Oxygen (wt %) by Shipment 2006
300
250
200
150
100
50
0
# of Shipments
# of Shipments 2004
# of Shipments 2005
# of Shipments 2006
Zero
Zero to 0.1
0.1 to 0.5
0.5 to 1.0
1.0 to 1.5
1.5 to 2.0
> 2.0
% Wt Oxygen

C. Maine Data on Other Gasoline Components: Sulfur, Benzene and Aromatics

Sulfur is a naturally occurring element that is found in crude oil. Sulfur contributes to particulate pollution that is particularly harmful to those with breathing difficulties such as asthma. Benzene is a colorless, sweet smelling gas that also occurs naturally in crude oil and is a known carcinogen. Aromatics are hydrocarbons which consist exclusively of the elements hydrogen and carbon. These compounds occur naturally in fossil fuels, are sweet smelling and include benzene, toluene and xylenes. Aromatics contribute to the formation of ground level ozone and are hazardous air pollutants.

Table 5 lists the statewide weighted averages of sulfur, benzene and aromatics in the 2006 fuel compared to 2005 and 2004 fuel, plus Phase 1 and Phase 2 RFG.

Table 5: Other Gasoline Components

Weighted Averages for:	***Sulfur***	***Benzene***	***Aromatics***
2006 Data	36.46 ppm	0.92 % Vol.	30.60 % Vol.
2005 Data	88.97 ppm	0.81 % Vol.	28.23 % Vol.
2004 Data	94.39 ppm	0.81 % Vol.	22.84 % Vol.
Ave. Phase I RFG	170 ppm	0.8 % Vol	26.3 % Vol
Ave. Phase II RFG	150 ppm	0.8 % Vol	24.0 % Vol

The sulfur levels in 2006 dropped due to the implementation of the Federal Tier 2 requirements for sulfur levels to meet a 30 ppm average sulfur level with an 80 ppm cap by January 1, 2006. The average sulfur in Maine was 36.46 ppm, which is higher than the required 30 ppm average which can be confusing until it is understood that it is possible for some shipments to have higher sulfur and still have the refinery average met because there is a per gallon cap of 80 ppm. Some shipments may also be lower than the 30 ppm as well, so the refiner must make sure that overall the total fuel it produces has an average no higher than 30 ppm. Figure 6 is a scatter-diagram of the ppm sulfur by delivery date and Figure 7 shows the ppm of sulfur for 2004, 2005, and 2006 by shipment. Figure 7-A shows the barrels of sulfur by range of sulfur (i.e. so many barrels for those deliveries with less than 100 ppm sulfur).

RFG is required to have a 1 percent benzene cap. In Maine, the overall average level of benzene in gasoline in 2006 was 0.92% and was higher than the 2005 level of 0.81% and higher than the RFG average benzene content. Benzene was reported in 102 of 315 shipments (32%), at levels of 1% or greater by volume, with a maximum level reported as high as 4.03% by volume. The number of shipments with benzene levels greater than the federal cap of 1% by volume more than tripled in 2006 compared to previous years. Maine received less shipments of RFG over the summer months than previous years. Figure 8 is a scatter-diagram of the percent volume benzene by delivery date, and Figure 9 shows the percent volume benzene levels for 2004, 2005, and 2006 by shipment.

The concentration of aromatics in gasoline for 2006 was 30.60 % by volume, higher than in RFG and higher than the levels reported in Maine gasoline in 2004 and 2005. The number of shipments of aromatics with concentrations greater than 40 % by volume increased 6 fold with a maximum level as high as 70 % by volume. Figure 10 is a scatter-diagram of the percent volume aromatics in 2006 by delivery date, and Figure 11 shows the percent volume aromatic levels for 2004, 2005, and 2006 by shipment.

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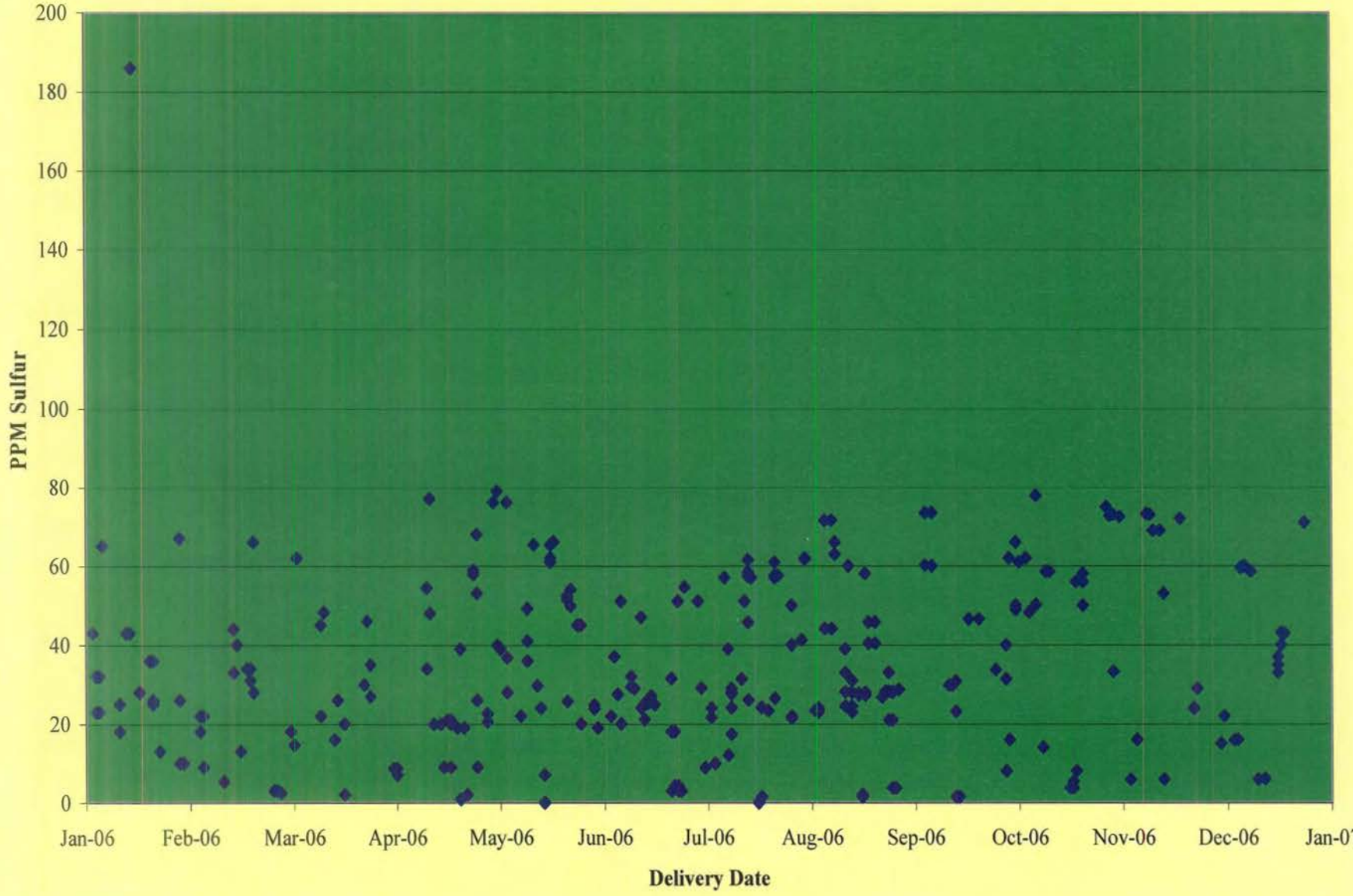
Figure 6
PPM Sulfur by Delivery Date 2006



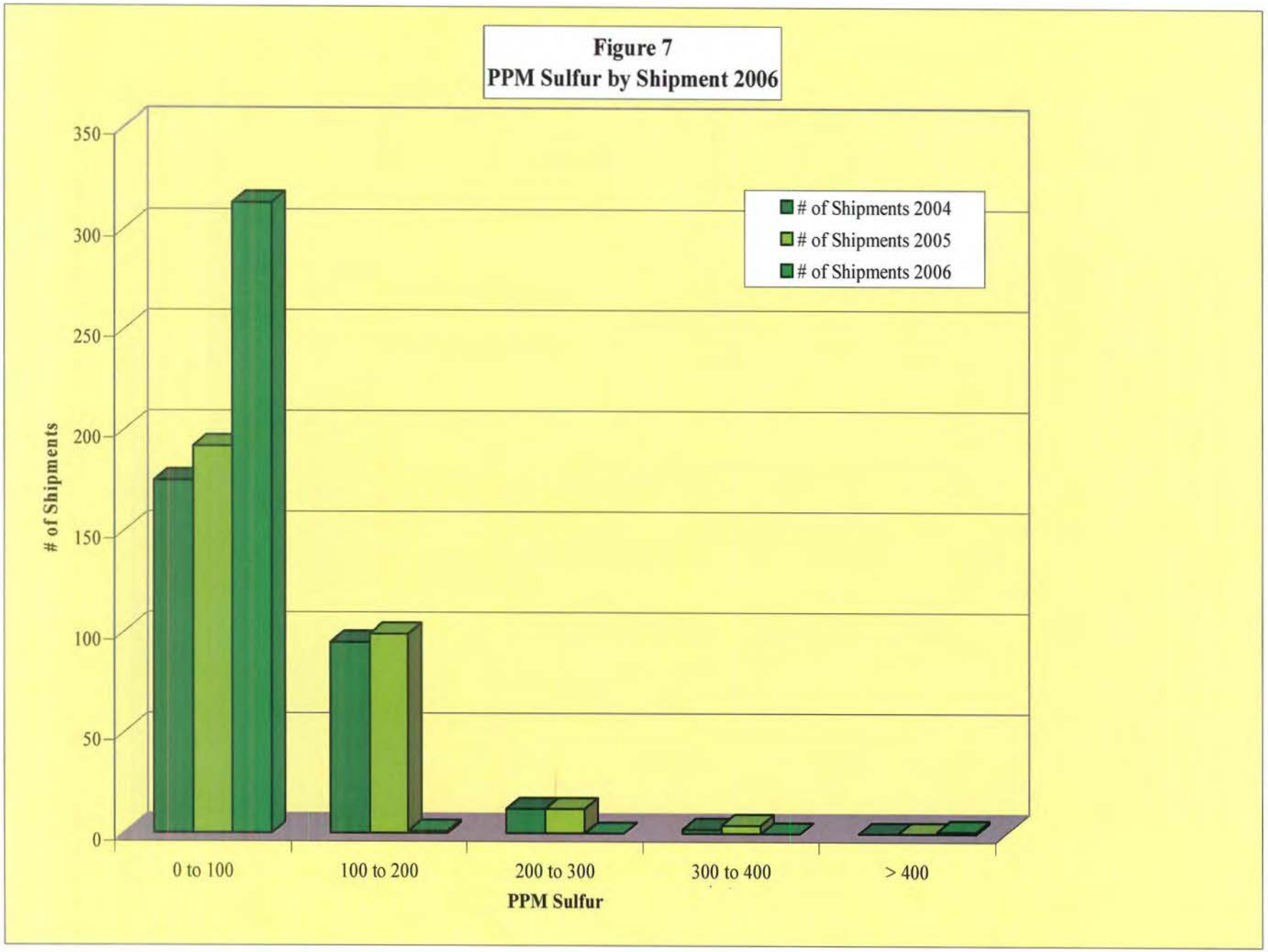


Figure 7
PPM Sulfur by Shipment 2006
350
300
250
200
150
100
50
0
# of Shipments
# of Shipments 2004
# of Shipments 2005
# of Shipments 2006
0 to 100
100 to 200
200 to 300
300 to 400
> 400
PPM Sulfur

Figure 7-A
PPM Sulfur by Barrel of Fuel 2006

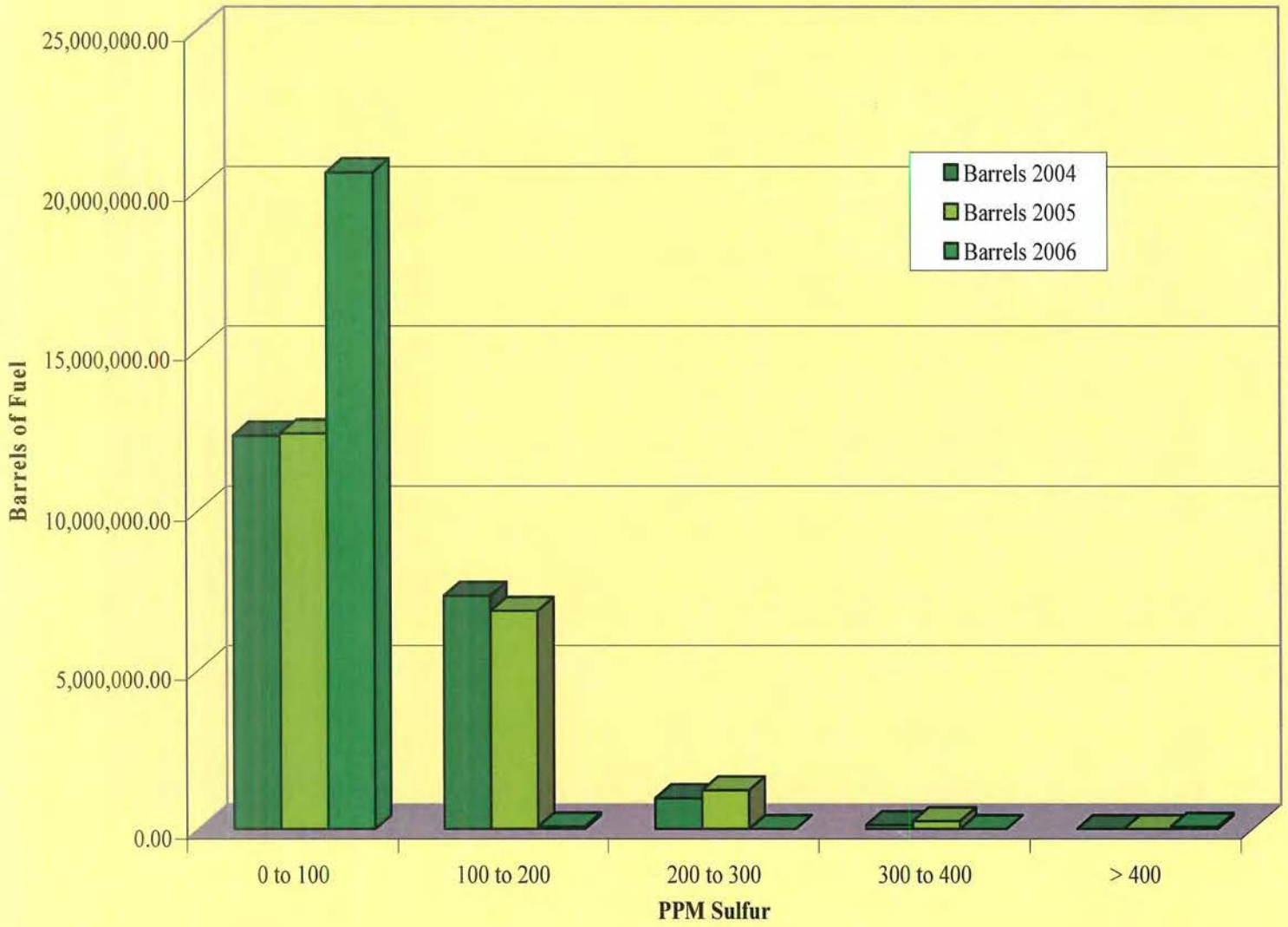
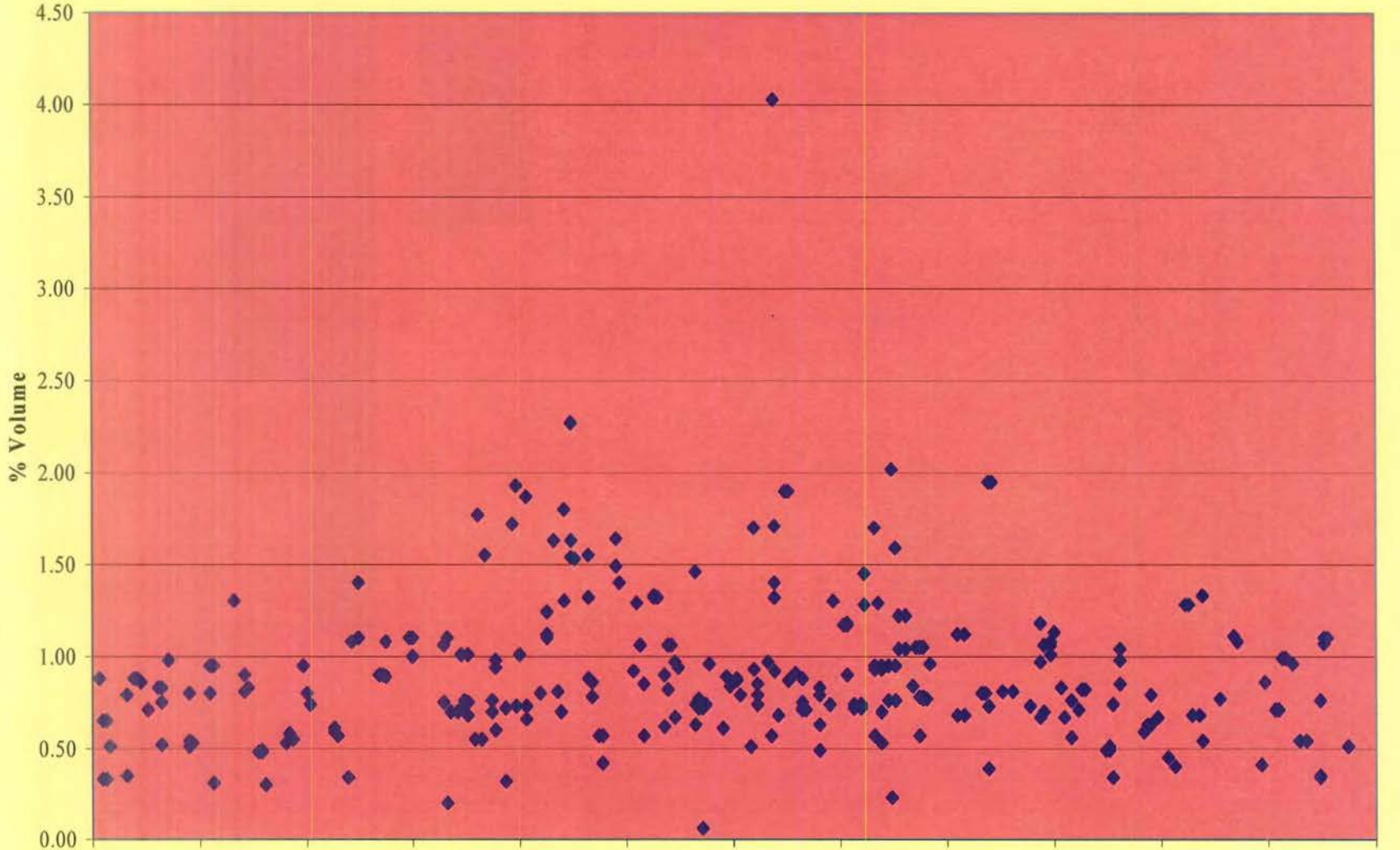


Figure 8
Benzene (% vol) by Delivery Date 2006



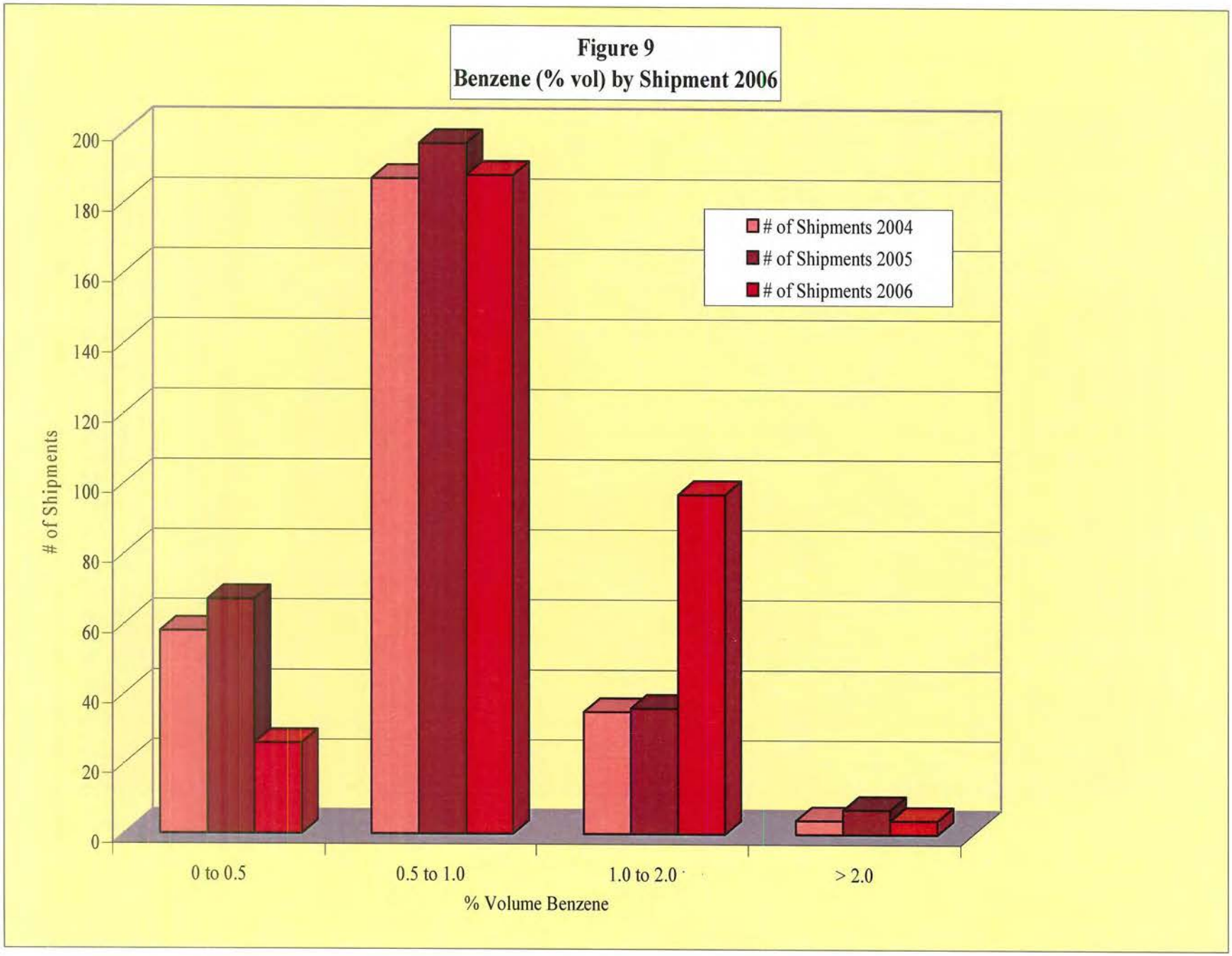


Figure 9
Benzene (% vol) by Shipment 2006
# of Shipments 2004
# of Shipments 2005
# of Shipments 2006
# of Shipments
200
180
160
140
120
100
80
60
40
20
0
0 to 0.5
0.5 to 1.0
1.0 to 2.0
> 2.0
% Volume Benzene

Figure 10
Aromatics (% vol) by Delivery Date 2006

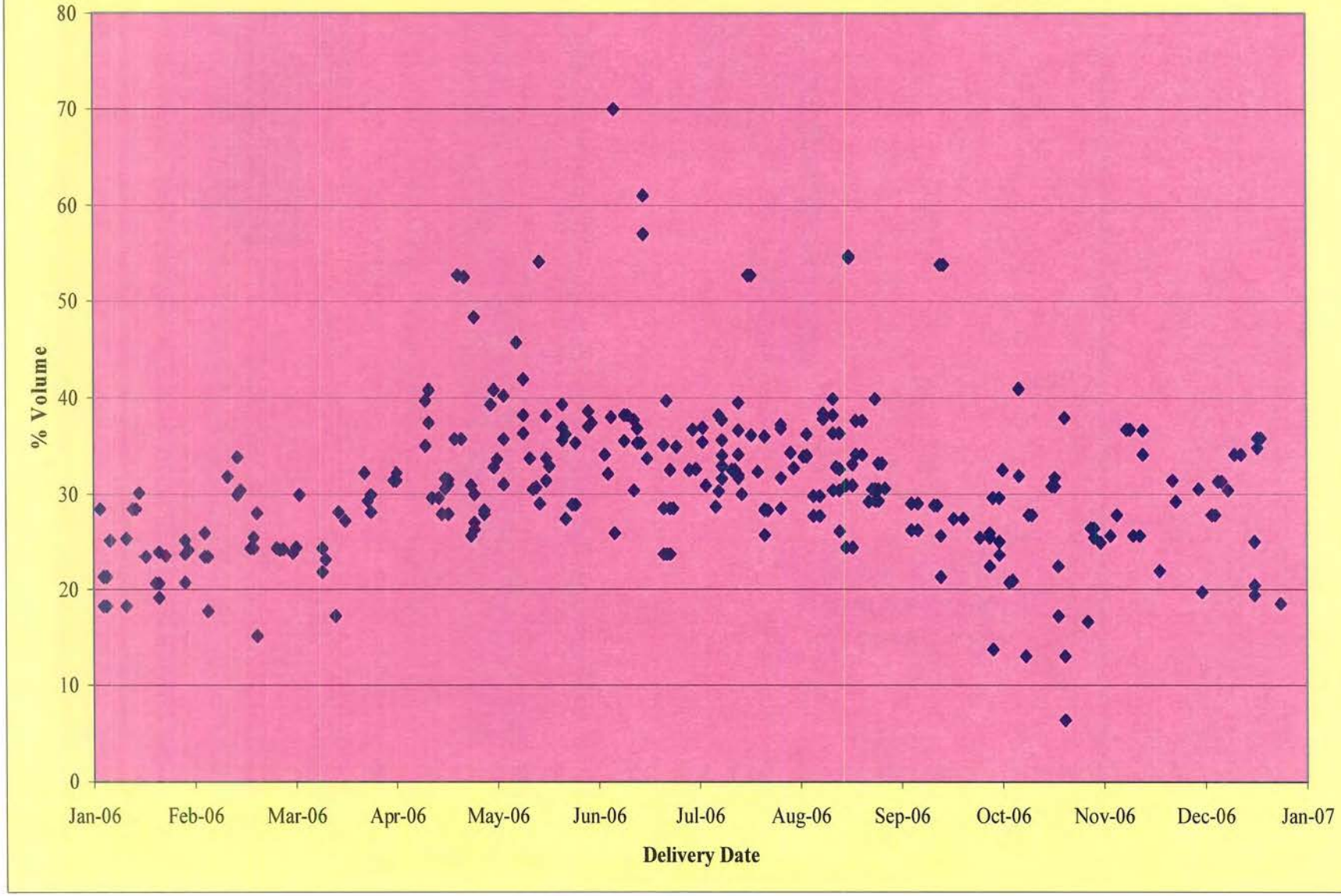
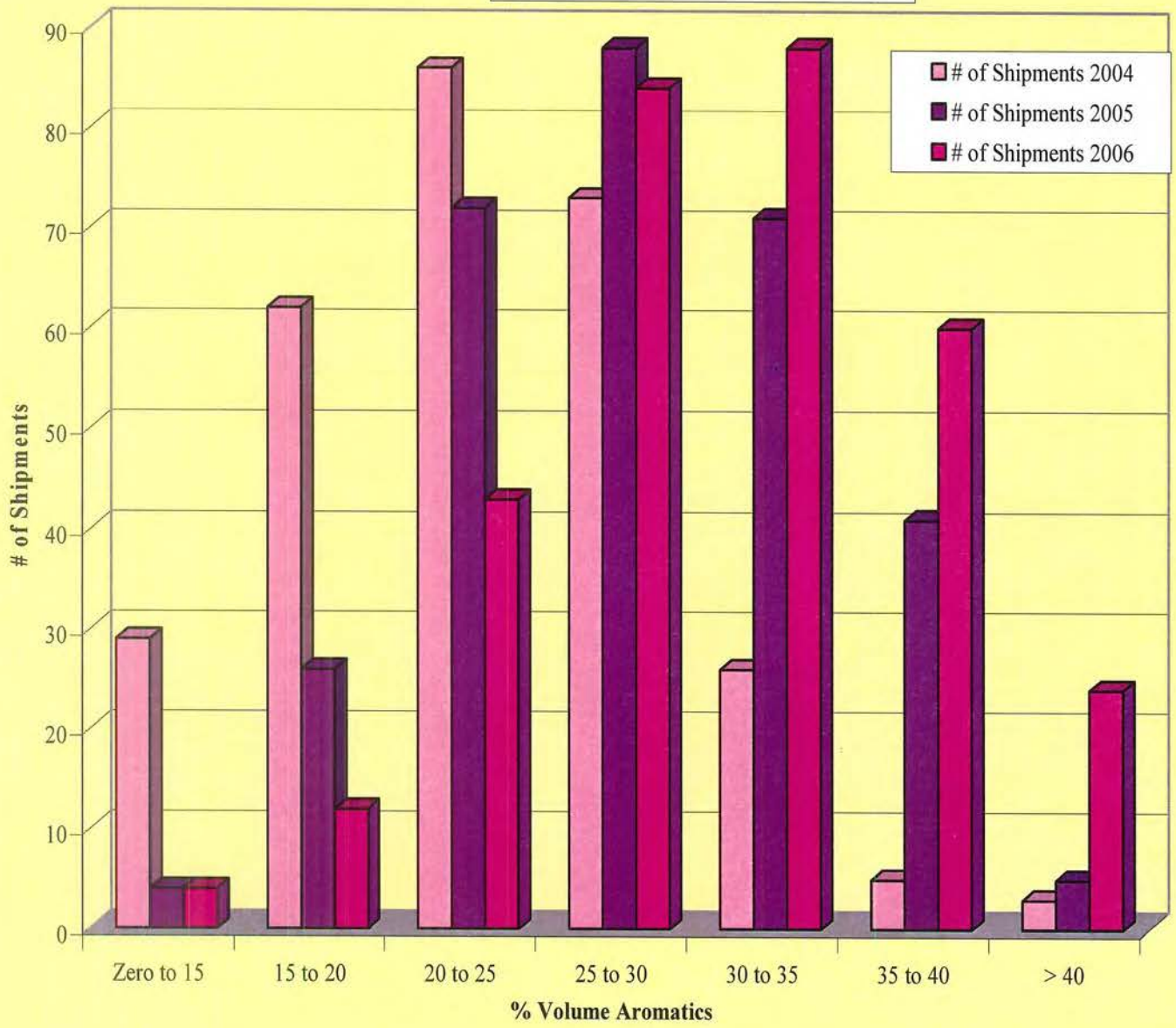


Figure 11
Aromatics (% vol) by Shipment 2006



D. Maine Data on Reid Vapor Pressure

Chapter 119 *Motor Vehicle Fuel Volatility Limit* requires that the Reid Vapor Pressure (RVP) of gasoline sold in Maine from May 1 to September 15 of each year shall not exceed 9.0 pounds per square inch (psi). Chapter 119 further limits the RVP of all gasoline sold in York, Cumberland, Sagadahoc, Androscoggin, Kennebec, Knox and Lincoln counties to not exceed 7.8 psi from May 1 to September 15 of each year.

The ozone season is from May 1 to September 15th of each year, which correlates to the period when 7.8 RVP is required in Maine's seven southern counties. Low volatility gas is required during the ozone season to reduce emissions of volatile organic compounds, which are precursors to ozone formation.

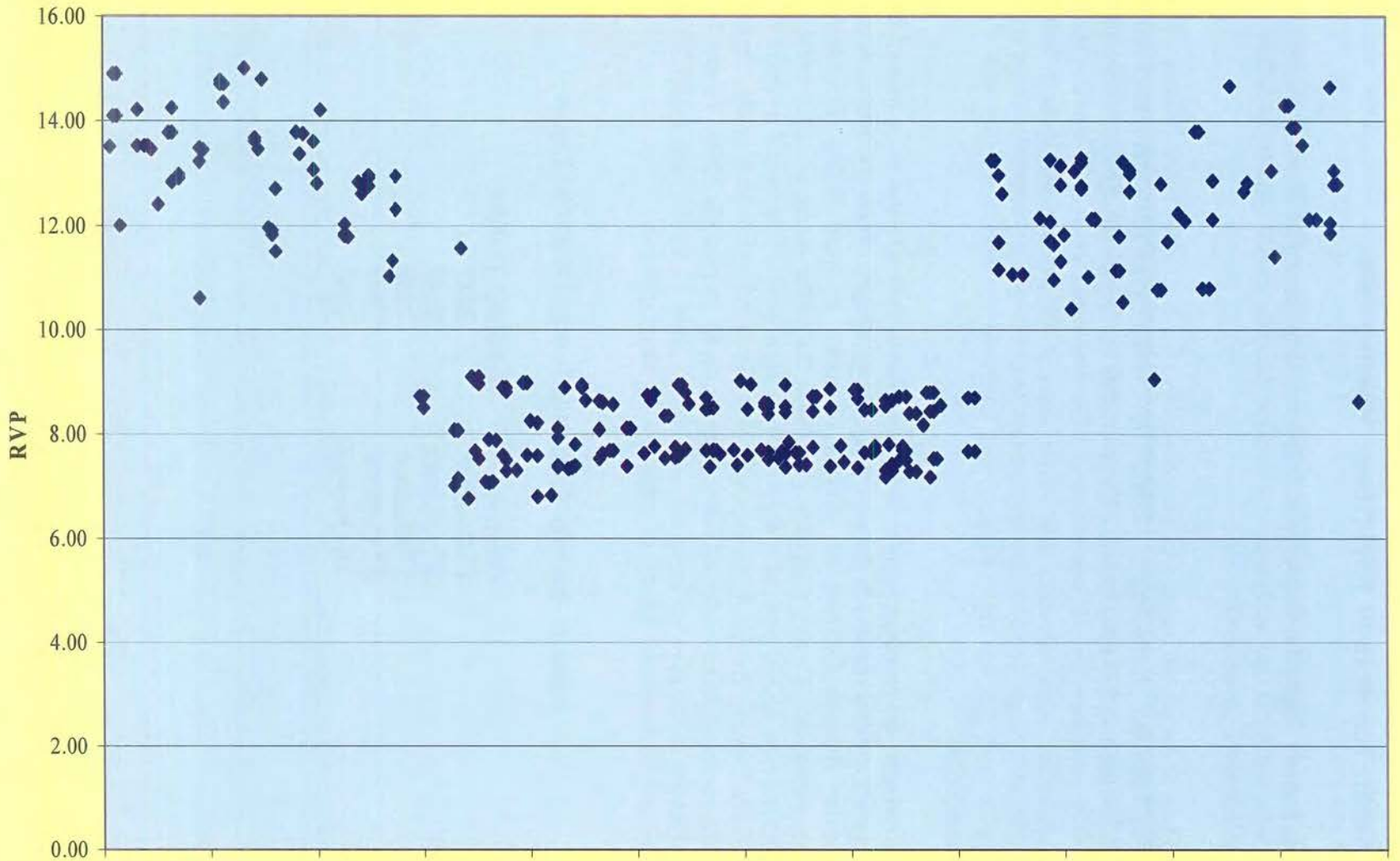
The average of all fuel sold during ozone season in Maine beginning in May through mid-September is shown below in Table 6.

Table 6: RVP Averages

RVP Reported	RVP Average
Ozone Season, 7 counties	7.54 psi
Ozone Season, statewide	8.10 psi
Entire Year, Statewide	10.37 psi

Figure 12 is a scatter-diagram of the Reid Vapor Pressure by delivery date.

Figure 12
RVP by Delivery Date 2006



E. Sulfur Levels in #2 Fuel (Home Heating Oil)

In January 2006, the Department began tracking the sulfur levels in #2 home heating oil delivered to Maine terminals. Collecting the data would establish a Maine baseline for sulfur in #2 home heating oil.

There is a regional interest in the possibility of a low sulfur home heating oil standard for the Northeast. According to NESCAUM, "reducing the sulfur content of heating oil from 2,500 ppm to 500 ppm lowers SO_2 emissions by 75 percent, PM emissions by 80 percent, NOx emissions by 10 percent, and CO_2 emissions by 1 to 2 percent. Other benefits associated with lowering the sulfur content of heating oil include heating system efficiency improvements, the opportunity to develop and market advanced high efficiency boiler and furnace technologies, and harmonizing with European and Canadian fuel standards."[19]

In Maine, the maximum sulfur content of fossil fuels allowed to be burned in various air quality control regions in the state is 2.5 % by weight, unless the source is equipped with sulfur dioxide controls or subject to more stringent sulfur limitations by other requirements. During Calendar year 2006 the sulfur levels in home heating oil ranged from a low of 350 ppm to a high of 7620 ppm with a year round average of 2462 ppm. Table 7 shows the quarterly averages of sulfur in # 2 home heating oil. Figure 13 depicts the levels of sulfur in the #2 home heating oil by quarter for 2006. Figure 14 is a scatter diagram of the ppm sulfur by delivery date, Figure 15 shows ppm sulfur by shipment and Figure 16 shows the barrels of sulfur by the range of sulfur.

Table 7: Average # 2 Home Heating Oil Sulfur Levels

Quarter	Weighted Average
1st Quarter	2387
2nd Quarter	2643
3rd Quarter	2468
4th Quarter	2441
All Quarters	2462

[19] Low Sulfur Heating Oil in the Northeast States: An Overview of Benefits, Costs and Implementation Issues Prepared by NESCAUM 101 Merrimac Street, 10th Floor, Boston, MA 02114 December 2005. Executive Summary pg: v.

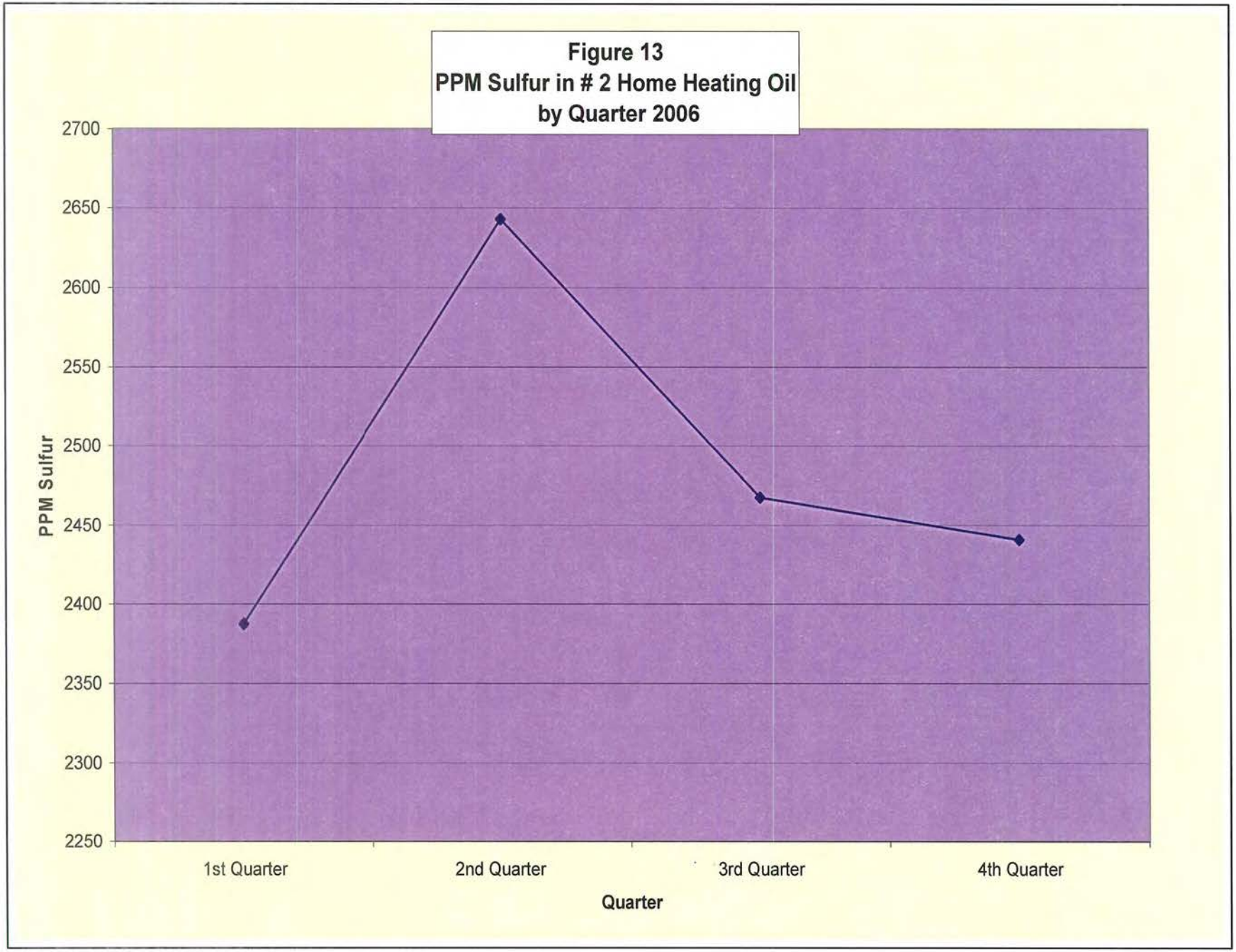


Figure 13
PPM Sulfur in # 2 Home Heating Oil
by Quarter 2006
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
PPM Sulfur
1st Quarter
2nd Quarter
3rd Quarter
4th Quarter
Quarter

Figure 14
PPM Sulfur in #2 Home Heating Oil
by Delivery Date 2006

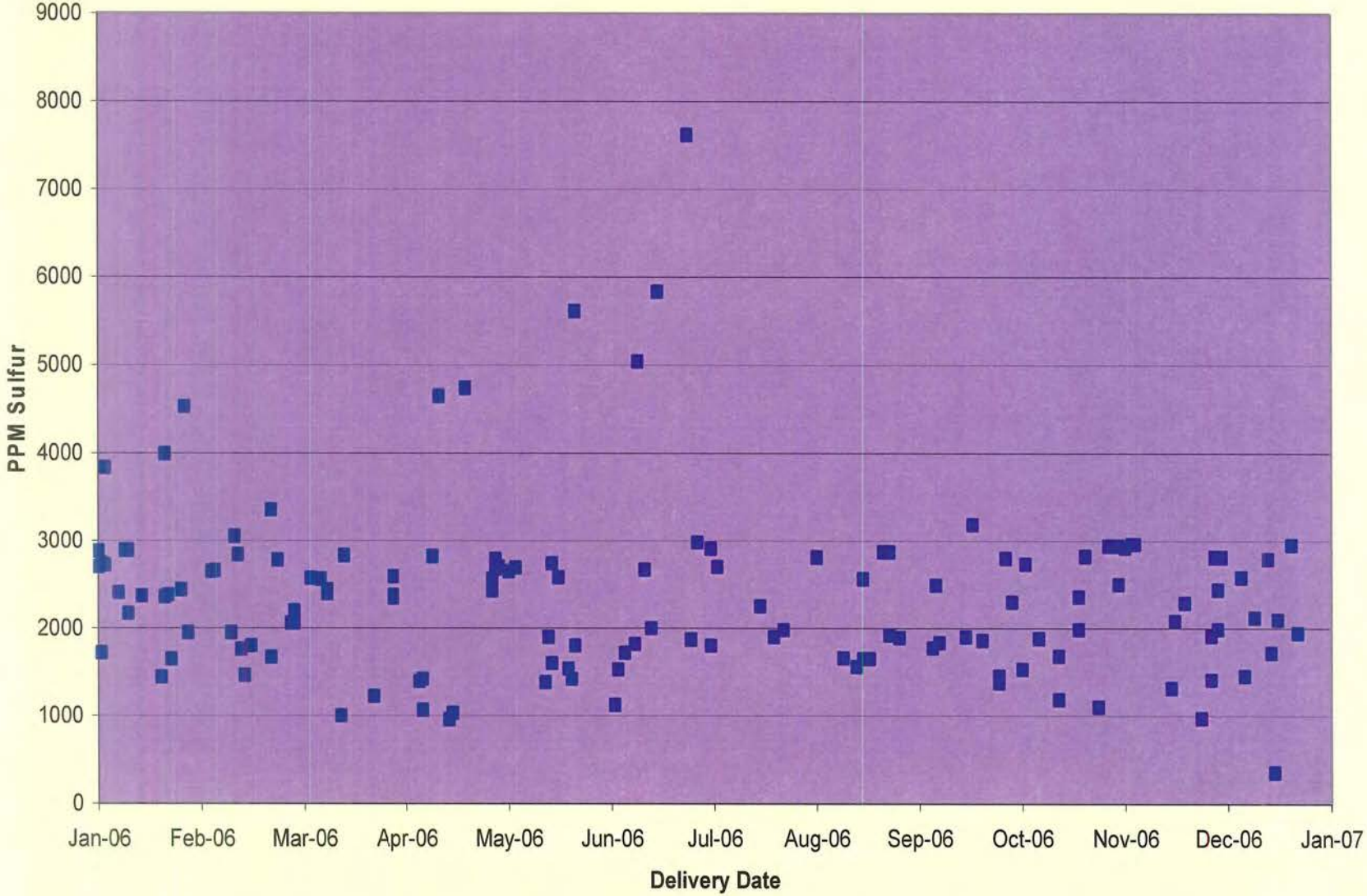
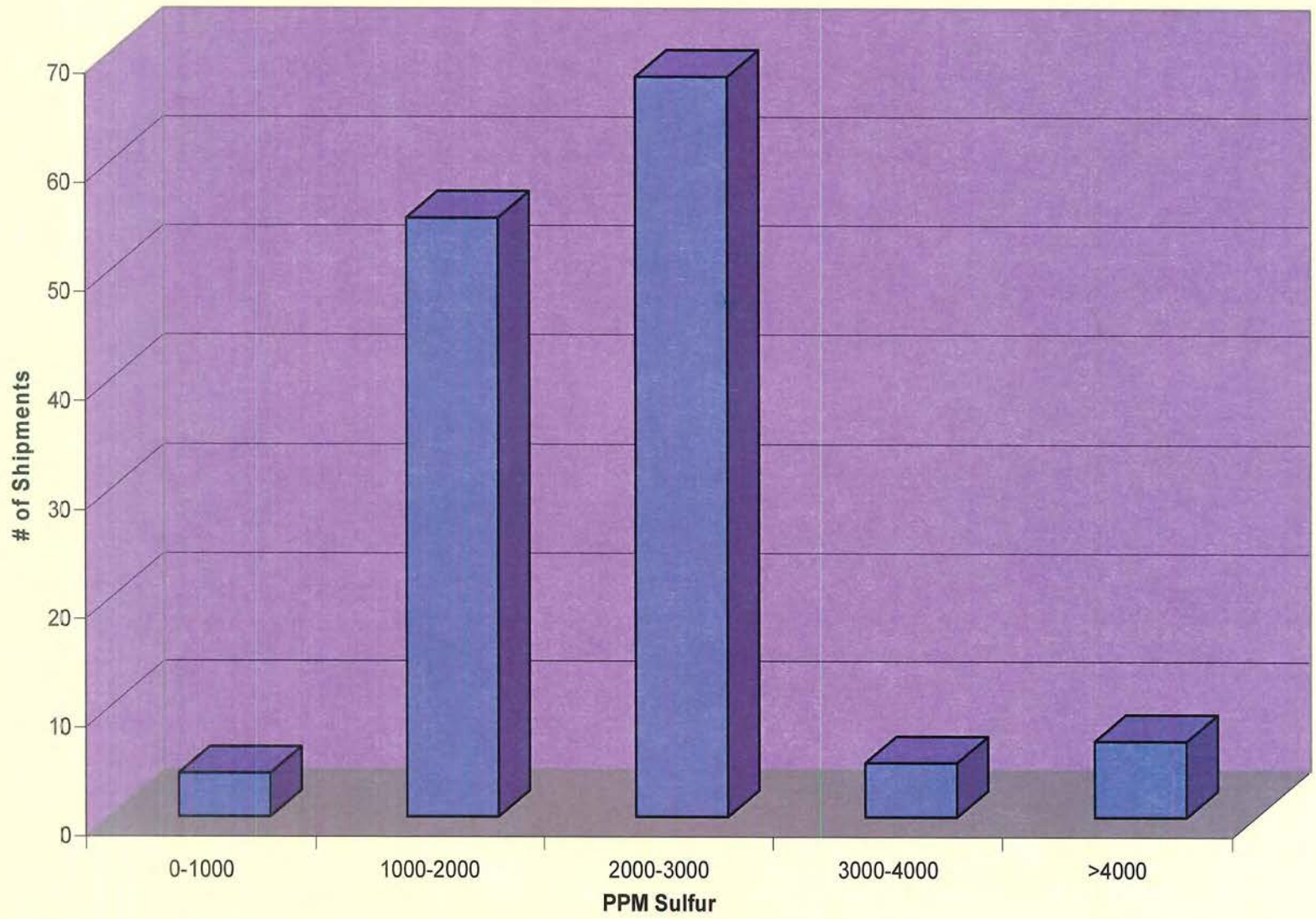


Figure 15 PPM Sulfur in #2 Home Heating Oil by Shipment 2006



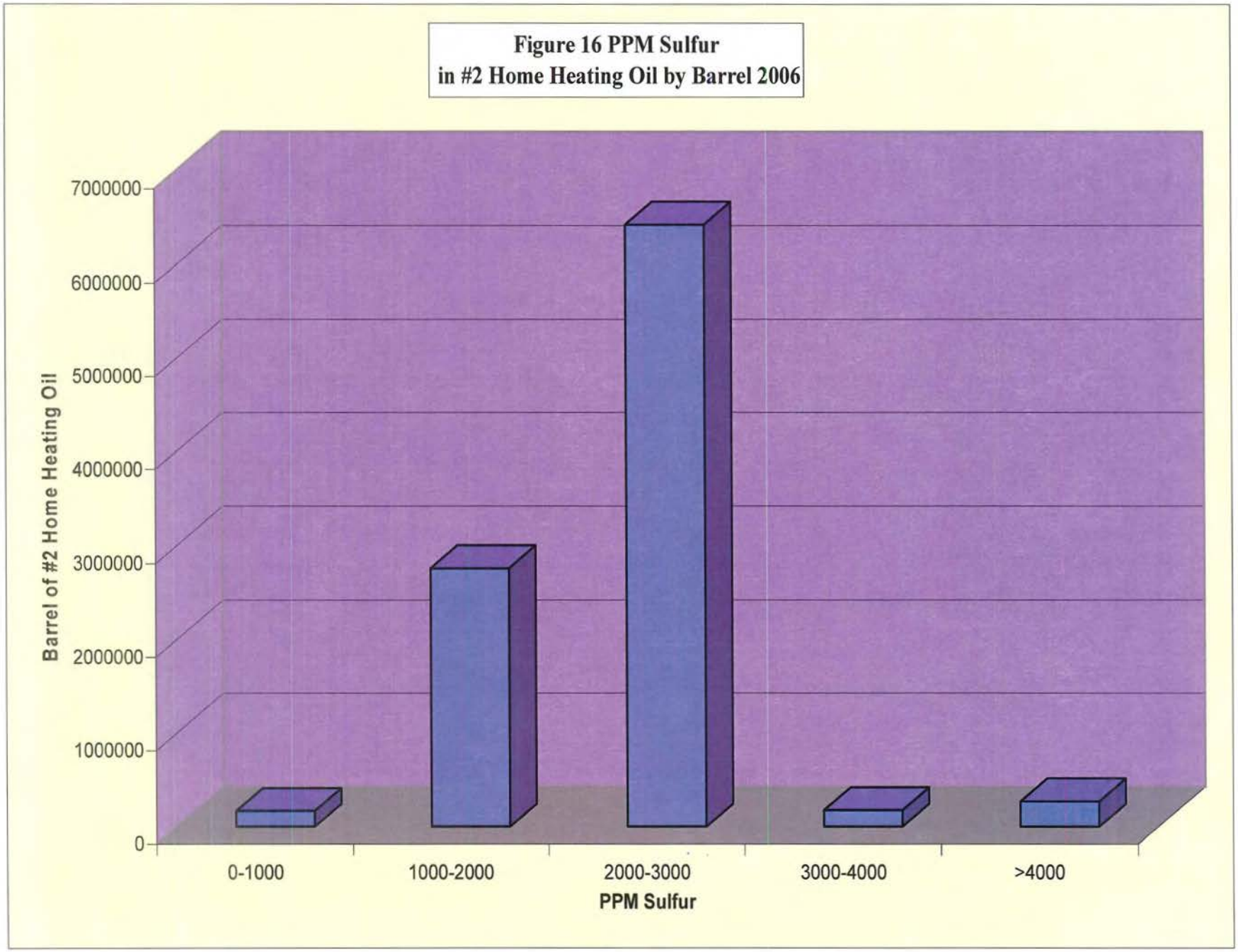


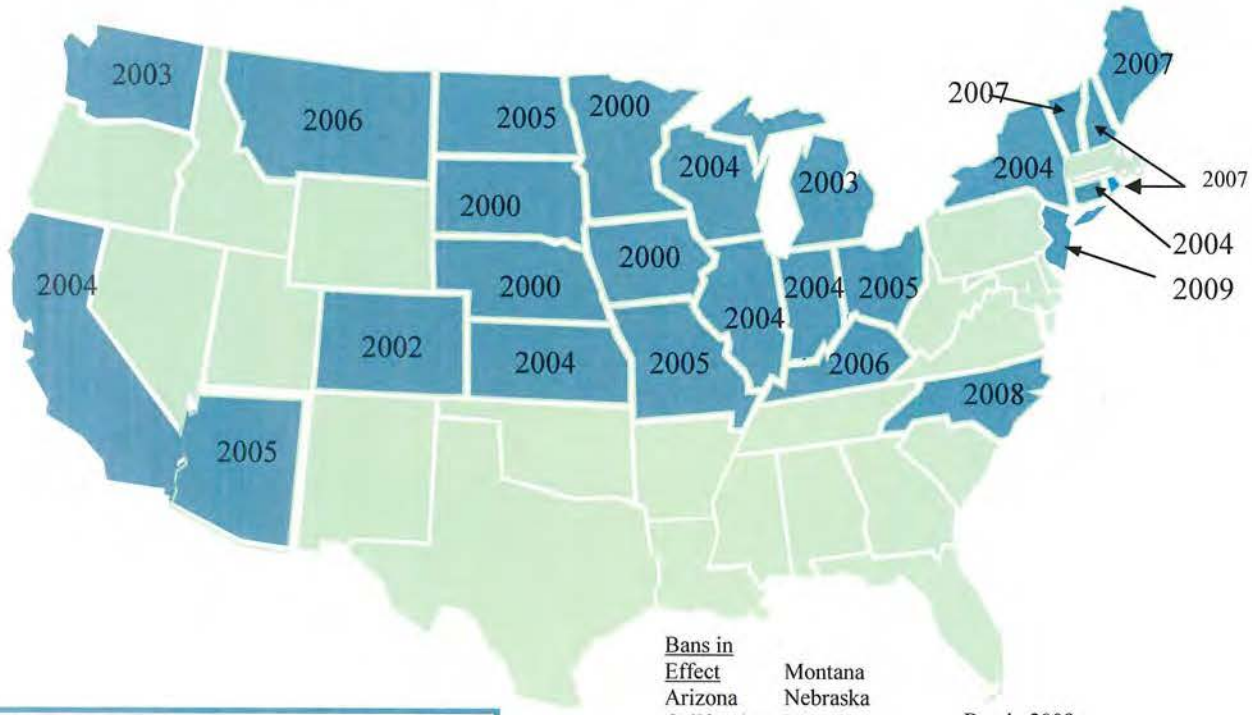
Figure 16 PPM Sulfur
in #2 Home Heating Oil by Barrel 2006
Barrel of #2 Home Heating Oil
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
0-1000
1000-2000
2000-3000
3000-4000
>4000
PPM Sulfur

Section IV: Progress Toward the Goal of Eliminating MTBE in Maine

Beginning January 1, 2007, no one may sell, offer for sale, distribute or blend in this State gasoline that contains more than ½ of 1% by volume MTBE. In response to this requirement MTBE levels began a steady and marked decrease in 2006. In the first quarter many of the shipments were typical of those seen in past years with a quarterly average of 1.33 percent by volume but in the second quarter of 2006 the levels of MTBE dropped significantly to 0.03 percent by volume MTBE. The third and fourth quarters also declined to below the detectable level of 0.1 % by volume

Map 1 is a map depicting the start years of all the states in the nation with MTBE bans.

Map 1: State MTBE Bans



Bans Currently in Place or Enacted: 27 states + Washoe County, Nevada

Bans in Effect

Arizona
California
Colorado
Connecticut
Illinois
Indiana
Iowa
Kansas
Kentucky
Maine
Michigan
Minnesota
Missouri
Montana
Nebraska
Nevada
New Hampshire
New York
North Dakota
Ohio
Rhode Island
South Dakota
Vermont
Washington
Wisconsin

Ban in 2008
North Carolina

Ban in 2009
New Jersey

API State Government Relations
January 2007

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Section V: Overview of Federal Action on RFG/MTBE and Fuels

A. Boutique Fuels Task Force Report and EPA DOE Boutique Fuels Report to Congress

Summary of the Findings and Recommendations. In 2006 the President directed the EPA administrator to invite the Governors of all 50 states (or their representatives) to participate in a task force to review the various requirements related to fuels. This Boutique Fuels Task Force of States for the President was charged with reviewing fuel related requirements, identifying opportunities to increase cooperation between the Federal Government and States on gasoline supply decisions and to reduce the number of boutique fuels. The task force's report was submitted to the President in June of 2006. The Task Force was composed exclusively of representative from the States, EPA, the U.S. Department of Energy (DOE), and the Department of Agriculture (DOA).

Section 1541(c) of the Energy Policy Act of 2005 required the EPA and the DOE to submit a report to Congress on the impact of state fuel programs approved under Section 211(c)(4)(c) of the Clean Air Act. Specifically the report was to address the fuels impact on air quality, the number of fuel blends, fuel availability and fuel costs. This report is one part of a broader EPAct requirement for EPA and DOE to analyze the effects of boutique fuels and other unique fuels on the nation's fuel system. The final EPA and DOE report was issued in December 2006.

The reports from both groups reached nearly identical conclusions. The findings, actions and recommendations of both reports are combined and summarized below.

- The U.S. gasoline production and distribution system is able to provide adequate quantities of boutique fuels, as long as there are no disruptions in the supply chain. If a disruption occurs (such as a hurricane or pipeline break) it becomes more difficult to move gasoline supplies around the country because of the limitations imposed by the boutique fuel requirements. Existing authorities have been used to temporarily waive boutique fuel requirements during times of supply disruption.

- The Energy Policy Act of 2005 includes provisions that will limit the future growth of new boutique fuels allowable under CAA Section 211(c) and provides additional authority to EPA to waive boutique fuel requirements when necessary to help alleviate unexpected supply disruptions.

- It is clear that state fuel programs have provided significant, cost-effective air quality improvements. Any actions to modify the slate of existing boutique fuels or limit a state's ability to adopt fuel specifications should be done in a manner

that at least maintains these air quality gains and avoids unnecessarily restricting state authority.

- EPA has and will continue to expeditiously implement the requirements of the Energy Policy Act of 2005 (EPAct) as they relate to boutique fuels. These actions will limit the growth of new boutique fuel requirements.

- Future analyses of potential changes to the number and types of fuels should utilize the most up-to-date data analytical tools. The joint EPA–DOE Fuel Harmonization Study required under Section 1509 of EPAct should ensure that all aspects, including the impacts of fuel requirement modifications on air quality, vehicle components and performance, fuel fungibility, fuel supply and fuel cost are appropriately addressed.

- As part of the analyses of future fuel options, careful consideration should be given to the possibility of new legislative authority which would allow for the adoption of regional clean fuel programs. Cleaner burning fuels used in broader geographic areas merit further study as an additional option for addressing fuel supply and fungibility concerns.

- Renewable fuels are an important part of the nation's plan to reduce our dependence on foreign oil. States are undertaking a number of actions to promote the use of such renewable fuels and the federal government is implementing programs, notably the Renewable Fuels Program established by EPAct, to do the same. Additional study would be beneficial to ensure these programs are working together and will not create undue impacts on air quality, fuel fungibility, fuel supply and/or fuel cost. DOE and EPA have concluded that further evaluation is required to determine whether additional legislative changes affecting boutique fuels beyond those already provided in EPAct are desirable. Accordingly, DOE and EPA propose to coordinate the EPAct Section 1541 boutique fuels report with the EPAct Section 1509 Fuel Harmonization Study. The Fuel Harmonization Study will require significant analysis and substantial resources in order to update existing models and fill in major data gaps. This includes, for example: a multi-year program to generate and analyze the impacts of numerous fuel properties on emissions from engines and vehicles and the collection and analysis of data from the pipeline and terminal industries regarding how different fuel types impact fuel distribution. Additional stakeholder involvement, particularly from the states, will also be critical. In the course of the Fuel Harmonization Study, EPA and DOE will continue to actively engage and seek input from state participants, industry stakeholders and others."[20]

[20] Report to the President; Task Force on Boutique Fuels Convened by Administrator Johnson, US Environmental Protection Agency, June 2006: Executive Summary pp 3-4 and EPA420-R-06-901 December 2006 EPAct Section 1541 (c) Boutique Fuels Report to Congress Executive Summary pp: 1-2.

Below is a table of EPA's list of state Boutique Fuels taken from the EPA Boutique Fuels website that lists the eight fuel types approved in State Implementation Plans (SIPs) under Section 211 (c)(4)(C) as of September 1, 2004.

Table 8: List of Boutique Fuels for State Implementation Plans (SIPs)

Type of Fuel Control	PADD**	State
RVP* of 7.8 psi	1	1 - ME (May 1-Sept. 15)***
	1	3 – PA
	2	5 – IN
	2	5 – MI
	3	6 – TX (May1 – Oct. 1)*
RVP of 7.2 psi	2	5 – IL
RVP of 7.0 psi	2	7 – KS
	2	7 – MO
	3	4 – AL
	3	6 - TX
RVP of 7.0 with gasoline sulfur provisions	1	4 - GA
Low Emission Diesel	3	6 - TX
Cleaner Burning Gasoline (Summer)	5	9 – AZ (May1 – Sept. 30)
Cleaner Burning Gasoline (non-Summer)	5	9 – AZ (Oct 1 – Apr. 30)
Winter Gasoline (aromatics & sulfur)	5	9 - NV

*Reid Vapor Pressure (RVP)

**Petroleum Administration for Defense Districts (PADD)

***Dates listed in parentheses refer to summer gasoline programs with different RVP control periods from the federal RVP control period, which runs from June 1 through September 15.

B. Renewable Fuels Standard

EPAct amended the Clean Air Act to establish a Renewable Fuels Standard (RFS) program. The U.S. Congress gave EPA the responsibility to coordinate with the U.S. Department of Energy, the U.S. Department of Agriculture, and stakeholders in designing and implementing this first-of-its kind program. This process could not occur prior to the start of the RFS program in January 2006, nor could EPA complete a rulemaking of this magnitude by the one-year deadline set forth in the Act. Therefore, in a December 2005 rulemaking, EPA set the statutory default standard requiring that 2.78 percent of the gasoline sold or dispensed in calendar year 2006 be renewable fuel. The new rulemaking proposes a comprehensive, long-term RFS program starting in 2007.[21]

"Section 1501 of the EPAct provides the statutory basis for the RFS program. This provision was added to the CAA as Section 211(o). It requires EPA to establish a program to ensure that the pool of gasoline sold in the contiguous 48 states contains specific volumes of renewable fuel for each calendar year starting with 2006. The required overall volumes for 2006 through 2012 are shown in Table 9 below.

Table 9: Applicable Volumes of Renewable Fuel Under the RFS Program

Calendar year	Billion gallons
2006	4.0
2007	4.7
2008	5.4
2009	6.1
2010	6.8
2011	7.4
2012	7.5

In order to ensure the use of the total renewable fuel volume specified for each year, the Agency must set a standard for each year representing the amount of renewable fuel that a refiner, blender, or importer must use, expressed as a percentage of gasoline sold or introduced into commerce. This yearly percentage standard is to be set at a level that will ensure that the total renewable fuel volumes shown in Table 9 will be used based on gasoline volume projections provided by the Energy Information Administration (EIA) (a statistical agency under DOE). Starting with 2013, EPA is required to establish the applicable national volume, based on the criteria contained in the statute, which must require at least the same overall percentage of renewable fuel use as was required in 2012"[22]

[21] EPA420-F-06-060 September 2006 EPA Regulatory Announcement (Fact Sheet) Background Section.
[22]Notice of Proposed Rulemaking EPA OAR-2005-0161: FR8218-8 RIN 2060-AN76 40 CFR Part 80 Regulation of Fuels and Fuel Additives: Renewable Fuels Standard Program Section I B. Requirements in the Energy Policy Act; FR pp: 55555-55556 September 22, 2006.

A renewable fuel is defined in the EPAct as a motor vehicle fuel that is produced from plant or animal products or wastes, as opposed to fossil fuel sources. Renewable fuels would include ethanol, biodiesel and other motor vehicle fuels made from renewable sources. Under the proposal, both renewable fuels blended into conventional gasoline or diesel and those used in their neat (unblended) form as motor vehicle fuel would qualify.[23]

C. Ultra Low Sulfur Diesel (ULSD)

New EPA standards required a significant reduction of sulfur in highway fuel from 500ppm to 15ppm for new 2007 engines with advanced emission control technology to perform properly. As of June 1, 2006 refiners were required to have 80% of the refinery output and imports be 15 ppm sulfur. As of September 1 all terminals that sell ULSD must adhere to all requirements and as of October 15, 2006 the nation's fuel retailers had to sell ULSD at the fuel pumps. Retailers were also required to label their pumps as to whether the pump had ULSD or 500 ppm sulfur. By June 1, 2010 all on-road diesel fuel must be ULSD. Compliance with the current ULSD requirement has been met and ULSD is readily available in Maine.

With the reduction of sulfur in the fuel, refiners have added lubricity to the fuel to meet American Society for Testing and Materials (ASTM) standards. This cleaner burning fuel also reduces air pollution. Non-road fuel (historically non-regulated) will be phased-in from 500 ppm fuel in 2007 to 15 ppm in 2010.

[23] EPA420-F-06-060 September 2006 EPA Regulatory Announcement (Fact Sheet) Background section

Section VI: Other States and Regional Activities

Regional Fuel

In 1999, a Northeast Regional Fuels Task Force was established at the direction of the New England Governors Association to look at regional solutions to address the MTBE issue. The Task Force's objectives were to maximize the air quality benefits and public health benefits of RFG, reduce the amount of MTBE in the gasoline supply to protect water resources, promote a regionally consistent clean fuels program, and to minimize the impact of fuel quality changes on gasoline supply and price.

For the past several years, the task force worked with the petroleum and ethanol industries as well as environmental groups to forge a compromise in legislative language on a Congressional bill that would phase-in the elimination of MTBE and require a national fuel with a renewable content requirement with clean air performance benefits. EPAct passed in July 2005 without a ban on MTBE, but did include a renewable fuels standard as well as removing the oxygenate requirement from the RFG program.

Some areas in the country with severe air quality pollution are required in the Clean Air Act to use RFG. Since many RFG states have banned MTBE, refiners are using ethanol as a replacement for MTBE as an oxygenate in the fuel. Connecticut and New York are receiving 10% ethanol in their fuel supply. Because Maine is not required to use RFG, we continue to receive conventional gasoline without MTBE and without needing ethanol as a fuel oxygenate. Handling of ethanol has unique requirements and would require a significant investment in the fuel storage and delivery infrastructure.

At this time discussions about a regional fuel continue but have not progressed beyond the discussion stage. The DEP will continue to work with NESCAUM and other regional organizations to achieve a regional solution to the fuels issue.