



Environment
Canada

Environmental
Protection
Service

Environnement
Canada

Service de la
protection de
l'environnement

Sulphur in Liquid Fuels

2004

Prepared by: Elizabeth Escorihuela
Fuels Division
Oil, Gas and Energy Branch
Air Pollution Prevention Directorate
Environment Canada

and Taryn Adams
Co-op Student
University of Waterloo

and Sean Poulter
Co-op Student
University of Ottawa

October, 2005

Environment Canada

Sulphur in Liquid Fuels

2004

Notice

The information contained in this report is compiled from data submitted by the producers and importers of liquid fuels in Canada pursuant to the requirements of the Federal *Fuels Information Regulations, No. 1*. Submissions have been verified for reasonableness but are subject to potential errors made at the source.

Any comments concerning the content of this report should be directed to:

Fuels Division
Oil, Gas, and Energy Branch
Environmental Protection Service
Environment Canada
Place Vincent Massey, 20th Floor
Gatineau, Quebec
K1A 0H3
Fax: (819) 953-8903

Table of Contents

1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION	6
2.1 FUELS INFORMATION REGULATIONS, NO. 1	6
2.2 REGULATIONS AND OTHER MEASURES TO ADDRESS SULPHUR LEVELS IN FUELS	6
2.3 PERIOD COVERED	8
2.4 REPORTING PETROLEUM REFINERIES AND IMPORTING COMPANIES	8
2.5 COMPANY SPECIFIC SULPHUR LEVELS	11
3.0 VOLUMES OF LIQUID FUELS PRODUCED / IMPORTED	12
4.0 VOLUMES OF LIQUID FUELS PRODUCED / IMPORTED AND FUEL SULPHUR CONTENT	13
4.1 NATIONAL AND REGIONAL SUMMARIES	13

List of Graphs

1.1 Sulphur Levels in Gasoline by Region, 1995-2004.....	2
1.2 National Trend of Sulphur Content in Gasoline (1999-2004)	3
1.3 Sulphur Mass in Liquid Fuels by Region, 1995-2004.....	4
4.1 National Liquid Fuel Production / Imports in 2004	14
4.2 Tonnage of Sulphur in Liquid Fuels in 2004.....	15
4.3 Mass of Sulphur in Liquid Fuels Produced / Imported in 2004	19
4.4 Sulphur Mass in Liquid Fuels by Region, 1995-2004.....	20
4.5 Sulphur Levels in Motor/Aviation Gasoline by Region, 1995-2004.....	21
4.6 Sulphur Levels in Motor Gasoline by Refinery/Importer in 2004	22
4.7 Sulphur Levels in Low-Sulphur Diesel Fuel by Refinery / Importer in 2004	23
4.8 Sulphur Levels in Diesel Fuel by Refinery / Importer in 2004	24
4.9 National Trend of Sulphur Content in Aviation Turbo Fuel, 1995-2004	25
4.10 National Trend of Sulphur Content in Motor/Aviation Gasoline, 1995-2004.....	25
4.11 National Trend of Sulphur Content in Kerosene / Stove Oil, 1995-2004	26
4.12 National Trend of Sulphur Content in Diesel Fuel (Total Pool), 1995-2004	26
4.13 National Trend of Sulphur Content in Light Fuel Oil, 1995-2004	27
4.14 National Trend of Sulphur Content in Heavy Fuel Oil, 1995-2004	27

List of Tables

1.1	Fuel Production / Imports and Sulphur Content, National Summary for 2004	5
2.1	Refineries, Blenders and Upgraders Reporting under the Respective Regulations.....	9
2.2	Importers Reporting under the Respective Regulations	10
3.1	Volume of Liquid Fuels Produced/Imported, Statistics Canada and Environment Canada Reporting	12
4.1	Fuel Production / Imports and Sulphur Content, National Summary for 2004	13
4.2A	Fuel Production / Imports, Atlantic Region Summary, 2004	16
4.2B	Fuel Production / Imports, Quebec Region Summary, 2004	16
4.2C	Fuel Production / Imports, Ontario Region Summary 2004.....	17
4.2D	Fuel Production / Imports, West Region Summary, 2004.....	17
4.2E	Regional and National Averages of the Density of Fuels Produced and Imported in 2004.....	18
A3.1.a	Volume Weighted Annual Sulphur Level in Motor Gasoline 1995-2004	38
A3.1.b	Volume Weighted Annual Sulphur Level in Motor Gasoline for 2004 (Reported by Quarters).....	39
A3.2.a	Volume Weighted Annual Sulphur Level in Low-Sulphur Diesel 1995-2004	40
A3.2.b	Volume Weighted Annual Sulphur Level in Low-Sulphur Diesel for 2004 (Reported by Quarters).....	41
A3.3.a	Volume Weighted Annual Sulphur Level in Regular Diesel 1995-2004	42
A3.3.b	Volume Weighted Annual Sulphur Level in Regular Diesel for 2004 (Reported by Quarters).....	43
A3.4.a	Volume Weighted Annual Sulphur Level in Light Fuel Oil 1995-2004	44
A3.4.b	Volume Weighted Annual Sulphur Level in Light Fuel Oil for 2004 (Reported by Quarters).....	45
A3.5.a	Volume Weighted Annual Sulphur Level in Heavy Fuel Oil 1995-2004	46
A3.5.b	Volume Weighted Annual Sulphur Level in Heavy Fuel Oil for 2004 (Reported by Quarters).....	47
A3.6.a	Volume Weighted Annual Sulphur Level in Aviation Gasoline (2002-2004)	48
A3.6.b	Volume Weighted Annual Sulphur Level in Aviation Gasoline for 2004 (Reported by Quarters).....	48

Appendices

Appendix 1:

Web-site References for *Fuels Information Regulation, No. 1* and other Fuels Regulations.....28

Appendix 2:

Sample Forms for Reporting Sulphur Content under the *Fuels Information Regulation, No. 1*,
Sulphur in Gasoline Regulations and *Sulphur in Diesel Fuel Regulations*.....30

Appendix 3:

Volume Weighted Annual Sulphur Levels by Refiner for 1995 to 2004

Appendix 4:

Canadian General Standards Board for Sulphur Content in Fuels

Appendix 5:

Maximum Sulphur Content in Fuels Federal and Provincial Regulations and
Municipal By-Laws.....51

Appendix 6:

Comparison of Average Fuel Sulphur Content from the 2004 Liquid Fuels Report with
the Limits Set Forth By the Canadian General Standards Board and the Provincial Regulations .54

Appendix 7:

Summary of the Election Information as per *Sulphur in Gasoline Regulations*

1.0 Executive Summary

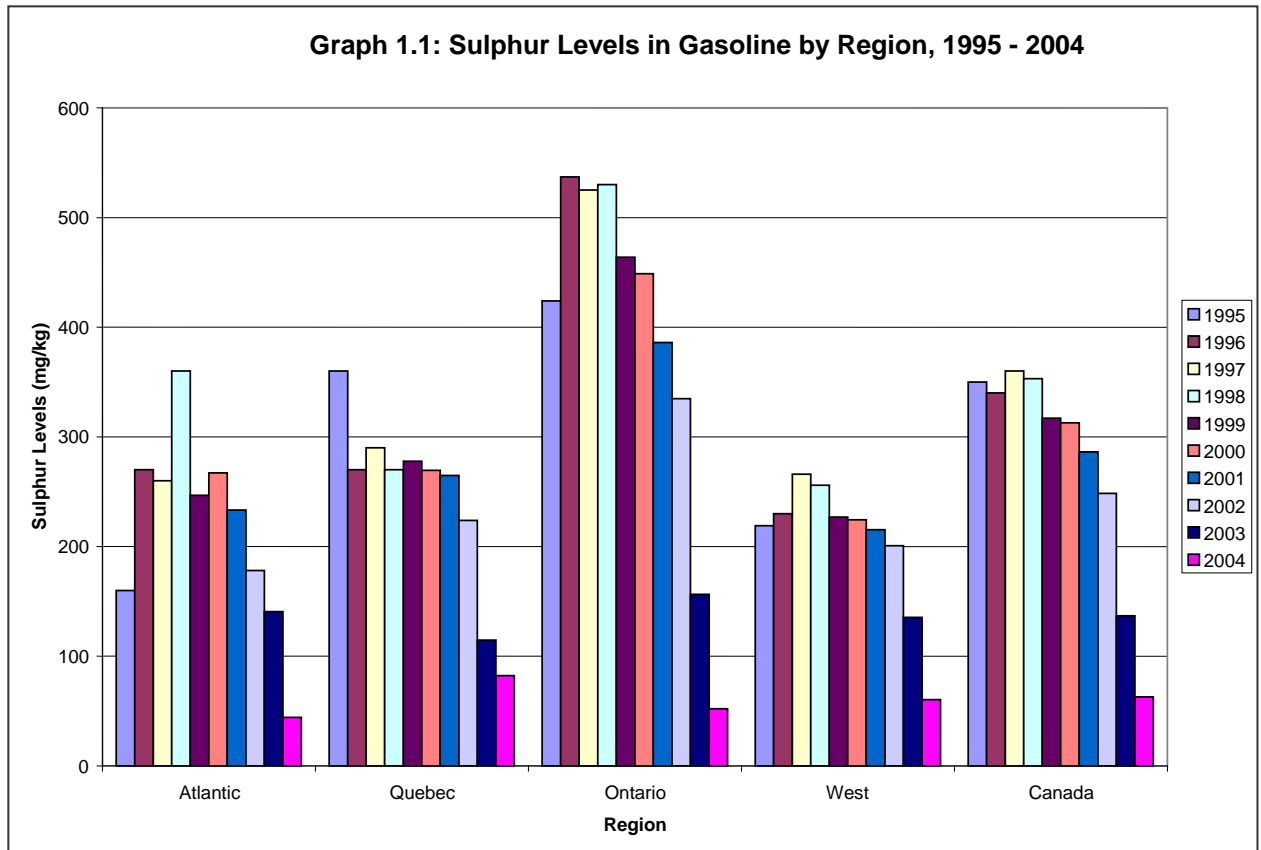
This report summarizes the 2004 data on the sulphur content in liquid fuels originating from crude oils, coal or bituminous sand. The information contained here was provided to Environment Canada by producers and importers of liquid fuels pursuant to the federal *Fuels Information Regulations, No.1* of the *Canadian Environmental Protection Act, 1999*.

During 2004, there were various developments with respect to federal regulations on sulphur in fuels and other non-regulatory issues:

- Under the *Sulphur in Gasoline Regulations*, the average sulphur limit of 150 mg/kg for the 2½ year interim period beginning July 1, 2002, ended on December 31, 2004. The final 30 mg/kg average limit came into effect on January 1, 2005.
- Proposed *Amendments to the Sulphur in Diesel Fuel Regulations* with limits for sulphur in off-road, rail and marine diesel fuels aligned with the levels and timing requirements passed by the U.S. Environmental Protection Agency were published in Part I of the *Canada Gazette* on October 2, 2004. The limits are:
 - 500 mg/kg for off-road, rail and marine diesel fuels in June 2007;
 - 15 mg/kg for off-road diesel fuel in June 2010; and
 - 15 mg/kg for rail and marine diesel fuels in June 2012.

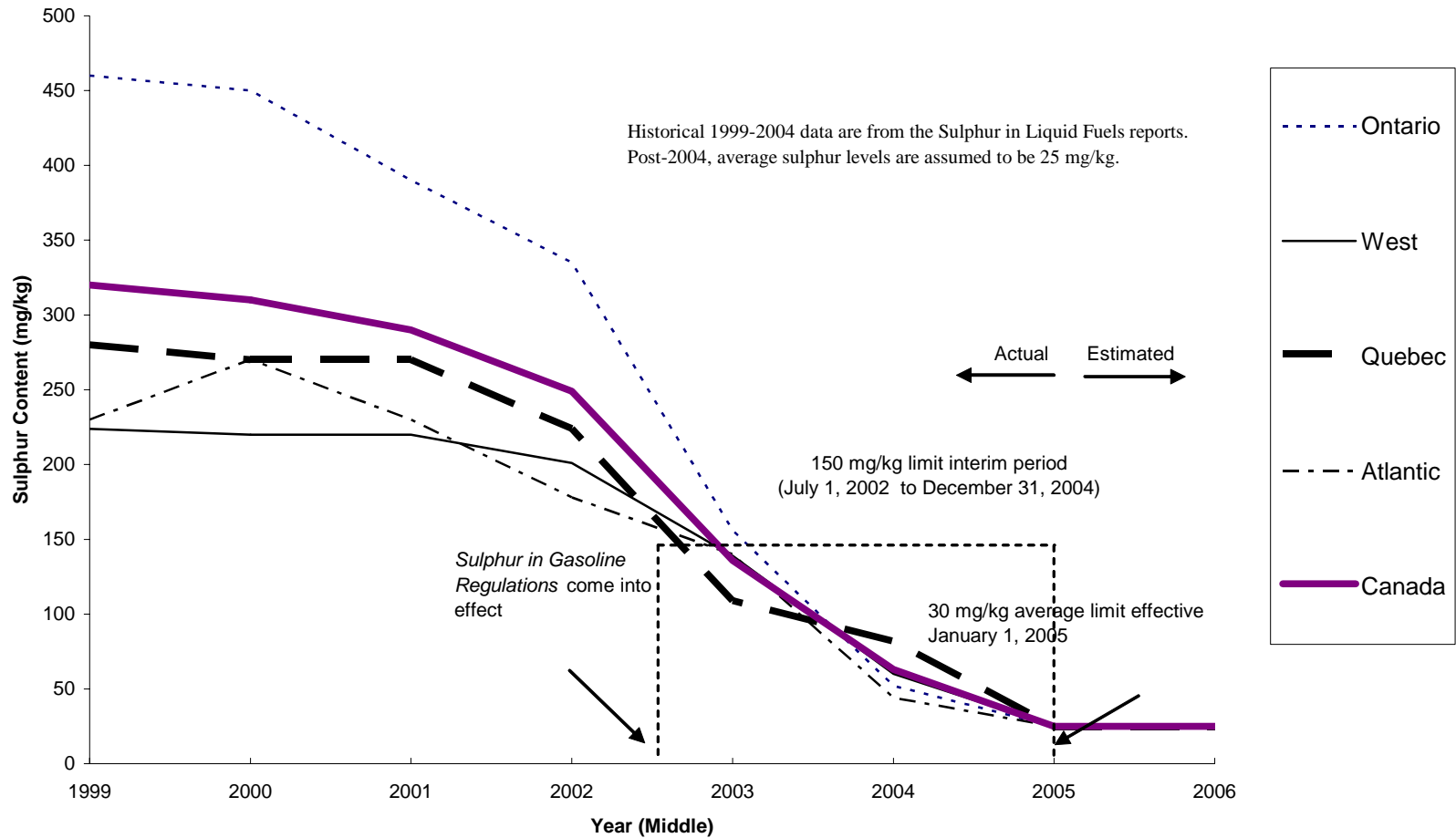
The target date for publication of the final *Regulations Amending the Sulphur in Diesel Fuel Regulations* is fall 2005.

In 2004, the national average sulphur content in gasoline was determined to be **62 mg/kg**, which represents a decline of 54% with respect to 2003 levels (136 mg/kg). Graph 1.1 shows the trend for sulphur content in gasoline nationally and by region for the period 1995 to 2004.



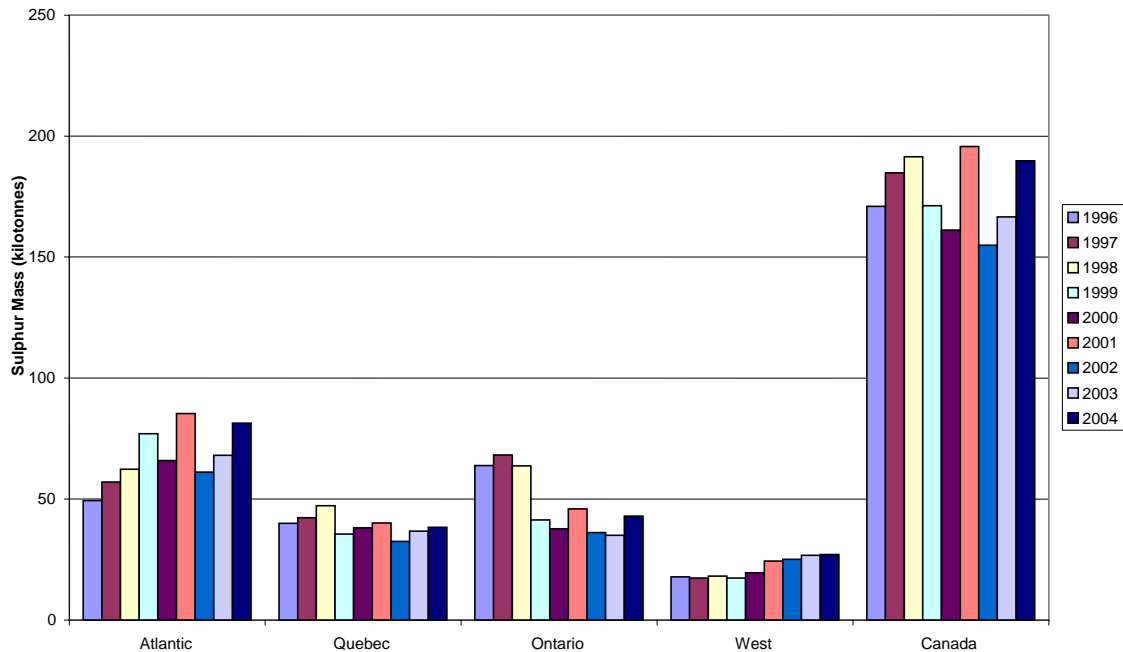
The lower sulphur levels in 2004 result from the *Sulphur in Gasoline Regulations*, which came into effect in 2002. The regulations set an average limit of 30 mg/kg commencing in 2005, with an interim limit of 150 mg/kg until then. Graph 1.2 shows the actual and projected trends in the levels of sulphur in gasoline from 1999 to 2006.

Graph 1.2: National Trend of Sulphur Content in Gasoline (1999-2006)



In contrast to the decline in the level of sulphur in gasoline, the reported mass of sulphur content in all liquid fuels nationally increased by **14%** in 2004 from 2003 values, as shown in Graph 1.3. In the Atlantic region, the reported mass of sulphur in all liquid fuels increased by 20% for 2004. In Ontario and Quebec the increases were 23% and 3% respectively. No increases were observed in the Western provinces.

Graph 1.3: Sulphur Mass in Liquid Fuels by Region, 1996 - 2004



The increases are mainly due to a 16% rise in the volume of plant consumption fuels (i.e., liquid refinery fuel, marine fuel IFO 30-460 and bituminous emulsion product ORIMULSION[®]) reported as being produced / imported in Canada, in combination with a reported increase in HFO (11%) with respect to 2003 figures plus higher sulphur concentrations (48%) in plant consumption fuel.

Table 1.1 shows the national summary of data compiled from Form 1, “Report on Sulphur Content”, of the *Fuels Information Regulations, No. 1*, which petroleum refineries and importing companies are required to submit to Environment Canada under those regulations.

The largest reported volume of liquid fuel produced in, or imported into Canada was gasoline which constituted 45.3% of all products, and accounted for 1.0% of the sulphur mass in liquid fuels. Heavy fuel oil constituted 9.3% by volume of the total liquid fuels and contained 66.1% of the total sulphur mass in Canada. The Atlantic, Quebec and Ontario provinces accounted for 85.6% of the total mass of sulphur present in fuels.

Forty-three (43%) percent of the total sulphur mass was attributed to the Atlantic provinces with HFO and plant consumption totalling 95% of this sulphur mass. Another 43% percent of the total mass was attributed to the provinces of Ontario and Quebec. HFO accounted for 79% of the sulphur mass for Quebec and 64% for Ontario.

TABLE 1.1 :
Fuel Production / Imports and Sulphur Content
National Summary for 2004

Type of Fuel	Fuel Production / Imports		Sulphur Mass (tonnes)	Average Sulphur Content (mg/kg)	Distribution of Sulphur in Products (%)
	(m ³)	(% of total)			
Aviation Turbo Fuel	7,457,332	8.0	3,589	590	1.9
Motor Gasoline	41,973,853	45.3	1,933	60	1.0
Aviation Gasoline	103,061	0.1	4	60	0.0
Kerosene/Stove oil	1,054,326	1.1	441	510	0.2
Low-Sulphur Diesel Fuel	23,632,374	25.5	5,891	300	3.1
Diesel Fuel	3,659,654	3.9	6,838	2,180	3.6
Light Fuel Oil	4,052,592	4.4	5,816	1,670	3.1
Heavy Fuel Oil	8,610,704	9.3	125,495	14,610	66.1
Plant Consumption	2,123,288	2.3	39,770	17,900	21.0
TOTAL	92,667,183	100.0	189,776	2,080	100.0

Note: Totals may not add up to due to rounding.

2.0 Introduction

2.1 *Fuels Information Regulations, No. 1*

The *Fuels Information Regulations, No.1* (see Appendix 2) were adopted in 1978 to provide Environment Canada with information regarding liquid fuel composition, particularly concerning sulphur dioxide (SO₂) emissions from combustion. These Regulations require annual reporting on sulphur levels in fuels and one-time reporting of non-lead fuel additive content (additional reporting is required when there are changes). They apply to all fuels¹ in liquid form that originate from crude oils, coal or bituminous sands.

The Regulations require all producers and importers handling more than 400 cubic meters (m³) of fuels intended for consumption in Canada within a calendar year to report the volume of fuels produced or imported, the fuel density and the fuel sulphur content for each quarter of the calendar year (see Appendix 2). Environment Canada uses the reported values to estimate the mass of sulphur in Canadian fuels. The types of liquid fuel to be reported can be found in Appendix 2. The Regulations also require all producers and importers who supply more than 400 m³ of a fuel to report all the additives other than lead or lead compounds in fuels.

Fuel text of the *Fuels Information Regulations, No.1* and reporting forms are available at http://www.ec.gc.ca/energ/fuels/regulations/fuelsreg_e.htm

2.2 *Regulations and other Measures to Address Sulphur Levels in Fuels*

Sulphur in Diesel Fuel Regulations

The federal *Sulphur in Diesel Fuel Regulations* which were in effect from January 1, 1998 to December 31, 2002, required all on-road diesel fuel to have a sulphur level not exceeding 0.05% by weight (500 mg/kg)². Those regulations were revoked and replaced on January 1, 2003 by the *Sulphur in Diesel Fuel Regulations* (see Appendix 2) which were passed on July 31, 2002. The *Sulphur in Diesel Fuel Regulations* continue the 500 mg/kg limit until June 1, 2006, at which time a 15 mg/kg limit comes into effect for on-road diesel fuel. The Canadian requirements for sulphur content in on-road diesel fuel align with those in the U.S. EPA's *Final Rule on Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*, published January 18, 2001. Note that there is no volume threshold for reporting under these regulations.

¹ Throughout this document, the word “fuel(s)” applies only to those fuels which are in liquid form and petroleum-based.

² From October 1, 1994 to December 31, 1997, a non-regulatory program was in place under which petroleum marketers agreed to make available only diesel fuel with a sulphur content not exceeding 0.05% by weight at all service stations, truck stops and on-road cardlocks and keylocks in Canada – approximately 50% of the on-road diesel fuel pool.

Proposed amendments to the federal *Sulphur in Diesel Fuel Regulations* were published in Part I of the *Canada Gazette* on October 2, 2004. The proposed amendments introduce limits for sulphur in off-road, rail and marine diesel fuels aligned with the levels and timing of requirements passed by the U.S. Environmental Protection Agency in June 2004. The proposed sulphur limits are:

- 500 mg/kg for off-road, rail and marine diesel fuels in June 2007;
- 15 mg/kg for off-road diesel fuel in June 2010; and
- 15 mg/kg for rail and marine diesel fuels in June 2012.

The target date for publication of the final *Regulations Amending the Sulphur in Diesel Fuel Regulations* is fall 2005.

The proposed amendments, along with the accompanying regulatory impact analysis statement are available at Environment Canada's Diesel Fuel website: http://www.ec.gc.ca/energ/fuels/fuel_home_e.htm#diesel.

Sulphur in Gasoline Regulations

On June 23, 1999, the federal government passed regulations limiting the amount of sulphur in gasoline. The *Sulphur in Gasoline Regulations* limit the sulphur content in gasoline to an average of 30 mg/kg with a maximum of 80 mg/kg starting January 1, 2005. An interim period beginning July 1, 2002, limits the average sulphur content of gasoline to 150 mg/kg over a 2½ year period.

Amendments to the regulations were published in Part II of the *Canada Gazette* on September 25, 2003. The amendments include the use of a recently-developed method that provides more accurate measurement of sulphur at low levels and the reporting of the sulphur limits in milligrams per kilogram (mg/kg) rather than in percent by weight.

Fuel text of the *Sulphur in Gasoline Regulations* and reporting forms are available at http://www.ec.gc.ca/energ/fuels/regulations/sulreg_e.htm

Canadian General Standards Board

The Canadian General Standards Board (CGSB) has commercial standards for fuels, some of which have been adopted by provinces in regulations. The standards for sulphur in fuels vary considerably between fuels (see Appendix 4). CGSB standards are revised periodically to reflect developments in product, usage and manufacturing technology.

Setting Canadian Standards for Fuel Oils used in stationary sources

In the Notice of Intent on Cleaner Vehicles, Engines and Fuels, published in the *Canada Gazette* on February 2001, Environment Canada proposed the development of measures to reduce the level of sulphur in both light and heavy fuel oils used in stationary sources, with the view to matching the requirements set by the European Union (i.e., 1% wt. for heavy fuel oil and 0.1% wt. for light fuel oil to be fully implemented by 2008). To this end, Environment Canada released a Discussion Paper in April 2003 and conducted a multistakeholder workshop in May 2003. Also, complementary measures to regulations,

such as economic instruments have been examined. Recent work by the National Round Table on the Economy and the Environment (NRTEE) involved studying the environmental and economic implications of using fiscal instruments to reduce sulphur levels in light and heavy fuel oil. More information is available at http://www.ec.gc.ca/energ/fuels/fuel_home_e.htm.

Environment Canada has received written comments on the issues presented in the Fuel Oils Discussion Paper and is currently assessing the path forward.

Low Sulphur Procurement Guide

Environment Canada and Friends of Earth have jointly produced a “*Low Sulphur Fuels Procurement Guide*” (June 2003) that is aimed at encouraging governments and other organizations to take leadership by procuring low sulphur fuels where possible. It provides a checklist of suggested low sulphur fuels procurement practices, contracting recommendations, suggestions for estimating emissions reductions, cases studies and links to key sources of information.

This *Guide* is available at http://www.ec.gc.ca/energ/ecology/ecol_home_e.htm.

2.3 Period Covered

This report covers the period from January 1 to December 31, 2004. Under the *Fuels Information Regulations No. 1*, petroleum refineries and importing companies are required to submit information for each quarter of the calendar year to Environment Canada on or before January 31 of the following year. Under the *Sulphur in Diesel Fuel Regulations*, quarterly reports are also required on the level of sulphur in diesel fuel with sulphur concentrations exceeding 500 mg/kg and equal or less than 500 mg/kg. The *Sulphur in Gasoline Regulations* require annual reporting on the level of sulphur in gasoline.

Failure to submit the data on time, incomplete data or unsigned forms are offences under the *Canadian Environmental Protection Act, 1999*.

2.4 Reporting Petroleum Refineries and Importing Companies

Table 2.1 lists the petroleum refineries, blenders, and upgrading plants that reported, under the three regulations, information pertaining to *production* volume and fuel sulphur content for 2004.

**Table 2.1
Refineries, Blenders and Upgraders Reporting under the respective Regulations**

Company	Location	Prov	FIR³	Gasoline⁴	Diesel⁵
Chevron Canada Limited	Burnaby	BC	x	x	x
Consumers' Co-operative Refineries Ltd.	Regina	SK	x	x	-
Husky Oil Operations	Prince George	BC	x	x	x
Imperial Oil Limited (Dartmouth Refinery)	Dartmouth	NS	x	x	x
Imperial Oil Limited (Sarnia Refinery)	Sarnia	ON	x	x	x
Imperial Oil Limited (Nanticoke Refinery)	Nanticoke	ON	x	x	x
Imperial Oil Limited (Regina Terminal)	Regina	SK	x	-	x
Imperial Oil Limited (Strathcona Refinery)	Edmonton	AB	x	x	x
Imperial Oil Limited (Winnipeg Distribution Terminal)	Winnipeg	MN	x	-	x
Irving Oil Limited	Saint John	NB	x	x	x
Newalta Corporations	North Vancouver	BC	x	-	x
NOVA Chemicals Canada Limited (Corunna Plant)	Sarnia	ON	x	-	x
Petro-Canada (Oakville Refinery)	Oakville	ON	x	x	x
Petro-Canada Lubricants (Lubricants Centre)	Mississauga	ON	x	-	x
Petro-Canada Products Limited (Edmonton Refinery)	Edmonton	AB	x	x	x
Petro-Canada (Ottawa Terminal)	Ottawa	ON	-	-	x
Petro-Canada (Thunderbay)	Thunderbay	ON	-	-	x
Robbins Feed and Fuel Limited (Blender)	Thorold	ON	x	x	-
Shell Canada Products (Sherwood Marketing Terminal)	Calgary	AB	-	x	-
Shell Canada Products Ltd. (Sarnia Manufacturing Centre)	Corunna	ON	x	x	x
Shell Canada Products Ltd. (Scotford Refinery)	Fort Saskatchewan	AB	x	x	x
Shell Canada Products Ltd. (Montreal East)	Montreal-East	QC	x	x	x
Suncor Energy Inc. (Oil Sands)	Fort McMurray	AB	x	-	x
Syncrude Canada Inc. (Mildred Lake Facility)	Fort McMurray	AB	x	-	x
Ultramar Canada Inc. (St-Romuald, Rfr.)	St-Romuald	QC	x	x	-

³ FIR: *Fuels Information Regulations No. 1*

⁴ Gasoline: *Sulphur in Gasoline Regulations*

⁵ Diesel: *Sulphur in Diesel Fuel Regulations*

The following petroleum importers reported, under the three regulations, information pertaining to *import* volume and fuel sulphur content for 2004:

Table 2.2
Importers Reporting under the under their respective Regulations

Company	Location	Prov.	FIR ⁶	Gasoline ⁷	Diesel ⁸
Air Canada (Westridge)	Westridge / Shellburn	BC	x	-	-
Air Canada (Quebec)	Quebec City	QC	x	-	-
Air Canada (Vopak)	Hamilton	ON	x	-	-
BP Cherry Point	Vancouver	BC	x	-	-
Cervini Farms Inc.	Leamington	ON	x	-	-
Coco Paving Inc.	Windsor	ON	x	-	x
Compagnie Miniere Quebec Cartier	Port-Cartier	QC	x	-	-
Compagnie Stadacoma	Quebec City	QC	x	-	x
General Motors of Canada Limited	Ontario	ON	-	x	x
Great Lakes Greenhouses Inc.	Leamington	ON	x	-	-
Imperial Oil Limited (Burrard Terminal)	Burnaby	BC	x	x	x
Kildair Services Ltd.	Tracy	QC	x	-	-
Mackenzie Petroleum Ltd.	Dawson City	YT	x	-	x
Marine Petrobulk Limited	N. Vancouver	BC	x	-	x
Neste Petroleum (Montreal)	Montréal-Est	QC	x	-	-
Neste Petroleum (Beauport)	Beauport	QC	x	-	-
New Brunswick Power Corporation	Fredericton	NB	x	-	-
Newfoundland and Labrador Hydro	St. John's	NF	x	-	-
Nexfor Fraser Papers	Edmundston	NB	x	-	-
NOCO Energy Canada Inc.	Toronto	ON	x	-	-
Norske Canada (Crofton)	Crofton	BC	x	-	-
Norske Canada (Elk Falls Division)	Campbell River	BC	x	-	-
North 60 Petro Ltd.	Whitehorse	YT	x	x	x
North Atlantic Refinery	Come-by-chance	NS	x	x	x
Nova Scotia Power Inc.	Halifax	NS	x	-	-
Olco CanTerm Montreal	Montreal	QC	x	-	-
Parkland Refining Limited	Bowden	AB	x	-	x
Petro-Canada Products Limited (Burrard Terminal)	Port Moody	BC	x	x	x
Petro-Canada Products Limited (Montreal)	Montréal	QC	x	x	-
Pétroles Norcan Inc.	Montréal	QC	x	x	x
Pope and Talbot Limited (Harmac Pulp Operations)	Nanaimo	BC	x	-	-
Port Colborne Quarries Limited	Port Colborne	ON	x	-	-
Shell Canada Products (Shellburn Terminal)	Burnaby	BC	x	-	x
Suncor Energy Products Inc.	Sarnia	ON	x	x	x
Suncor Energy Products Inc.	Quebec	QC	-	x	x
Ultramar Canada Inc.	Halifax	ON	-	-	x
Ultramar Canada Inc.	Holyrood	NF	x	x	x
Ultramar Canada Inc.	Montreal East	QC	x	-	x
Western Pulp Inc.	Port Alice	BC	x	-	-

⁶ FIR: *Fuels Information Regulations No. 1*

⁷ Gasoline: *Sulphur in Gasoline Regulations*

⁸ Diesel: *Sulphur in Diesel Fuel Regulations*

2.5 Company Specific Sulphur Levels

Appendix 3 presents data on the annual volume-weighted sulphur content (in mg/kg) for gasoline, diesel fuel and fuel oil during the period of 1995 to 2004 for each Canadian refinery and importer.

3.0 Volumes of Liquid Fuels Produced / Imported

In order to verify the accuracy, the reported volumes of produced fuels were compared to Statistics Canada figures for 2004 (see Table 3.1).

With the exception of kerosene/stove oil, there appears to be reasonable agreement between the two sets of data. These may result from the given differences in approaches noted below.

Type of Fuel	Statistics Canada	Environment Canada
	(m ³)	(m ³)
Aviation Turbo Fuel	6,684,203	7,457,332
Motor / Aviation Gasoline	41,053,988	42,076,914
Kerosene/Stove oil	437,415	1,054,326
Low-Sulphur Diesel Fuel	-	23,632,374
Diesel Fuel	25,306,047	3,659,654
Light Fuel Oil	5,183,340	4,052,592
Heavy Fuel Oil	9,187,382	8,610,704
Plant Consumption	2,191,256	2,123,288
TOTAL:	90,043,631	92,667,183

Notes:

1. Statistics Canada data were compiled for the period Year 2004. Source: Statistics Canada, Catalogue no. 45-004-XIB Monthly, December 2004.
2. According to Statistics Canada, approximately 75-80% of refinery-produced kerosene and stove oil are later transferred to diesel and light fuel oils.
3. Statistics Canada does not distinguish between low-sulphur and regular diesel grades.
4. Volumes reported to Environment Canada mostly reflect production at the various refineries while Statistics Canada considers opening and closing inventories and inter-product transfers.
5. Plant consumption fuel is almost all heavy fuel oil, but in some instances includes liquefied refinery gas, light fuel oil and diesel. Environment Canada is including the "plant consumption" volumes of marine bunker fuel (i.e., intermediate fuel oil IFO 30-460), liquid fuel refinery, and bituminous emulsion product ORIMULSION[®]) in the 2003 figures (Marine bunker fuel and bituminous emulsions are not included in the Statistics Canada inventory).

4.0 Volumes of Liquid Fuels Produced / Imported and Fuel Sulphur Content

4.1 National and Regional Summaries

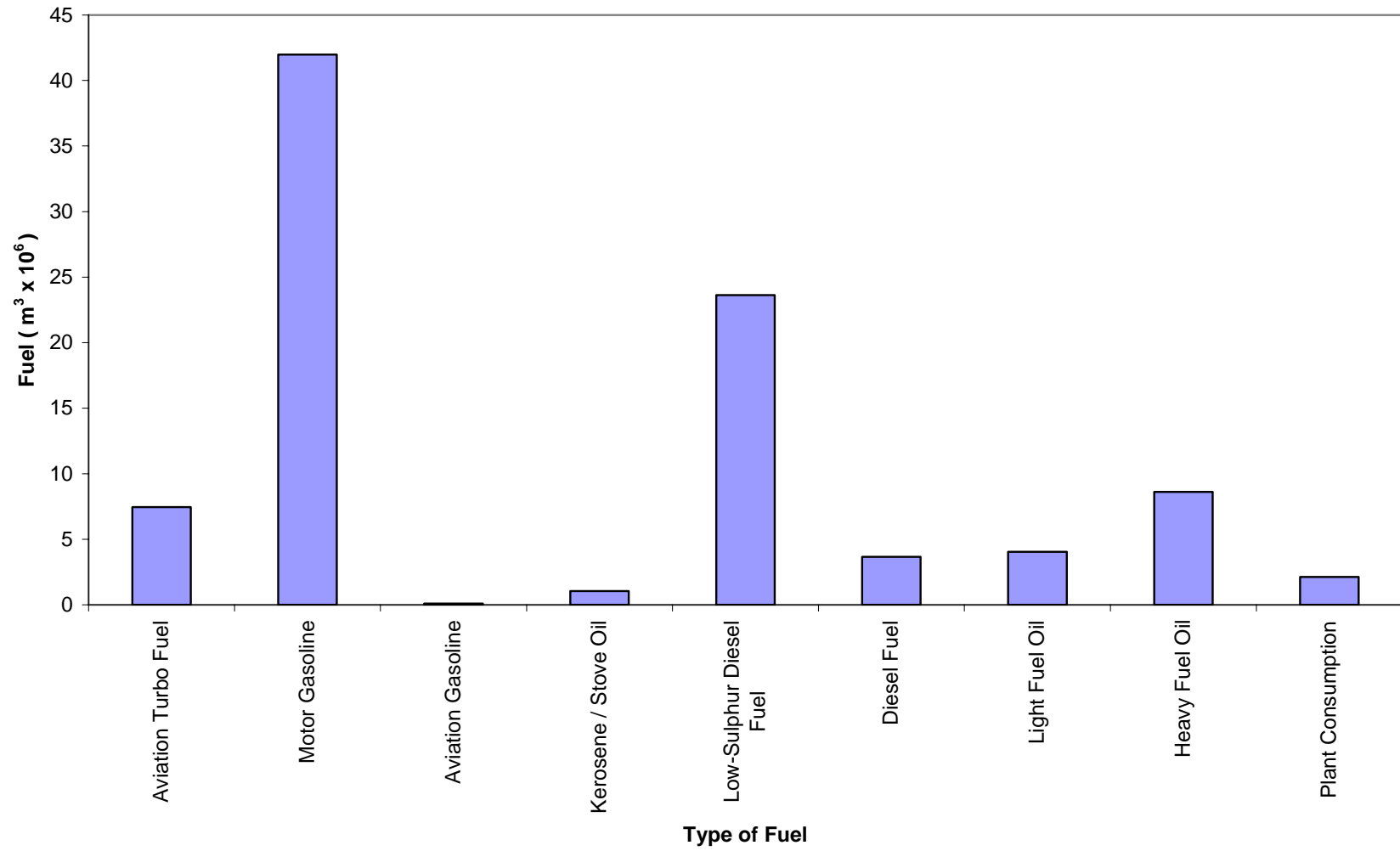
The following graphs and tables summarize the data compiled from reports submitted pursuant to the *Fuels Information Regulations No. 1* for 2004:

- National Data for Liquid Fuels: Table 4.1, Graphs 4.1 and 4.2
- Regional Data for Liquid Fuels: Tables 4.2A-E, Graphs 4.3 and 4.4
- Regional Data for Motor/Aviation Gasoline: Graph 4.5
- Refinery Data for Motor Gasoline: Graph 4.6
- Refinery Data for Diesel Fuel: Graphs 4.7 and 4.8
- Historical Trends (National): Graphs 4.9 to 4.14

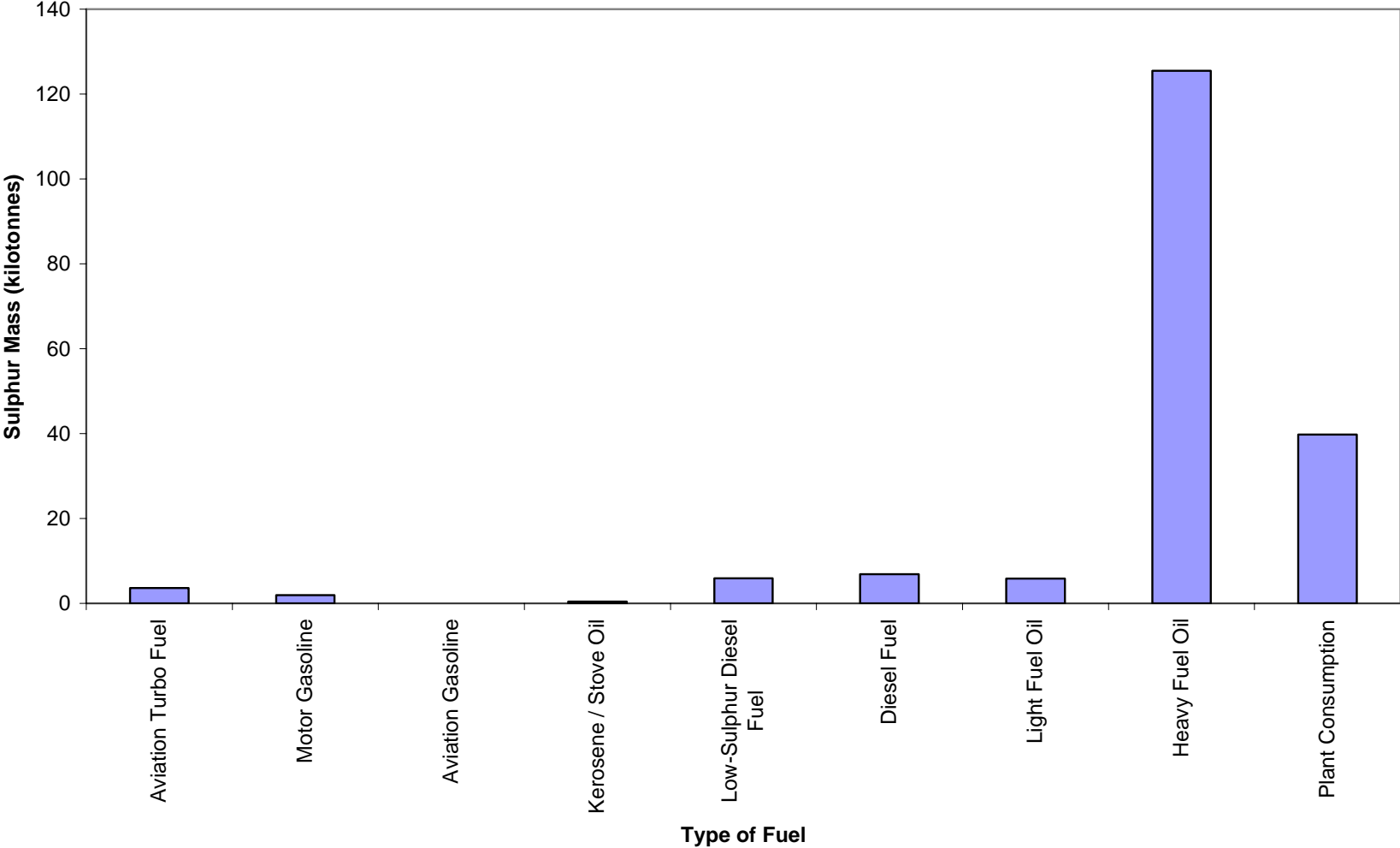
Type of Fuel	Fuel Production / Imports		Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
	(m ³)	(% of total)			
Aviation Turbo Fuel	7,457,332	8.0	3,589	590	1.9
Motor Gasoline	41,973,853	45.3	1,933	60	1.0
Aviation Gasoline	103,061	0.1	4	60	0.0
Kerosene/Stove oil	1,054,326	1.1	441	510	0.2
Low-Sulphur Diesel Fuel	23,632,374	25.5	5,891	300	3.1
Diesel Fuel	3,659,654	3.9	6,838	2,180	3.6
Light Fuel Oil	4,052,592	4.4	5,816	1,670	3.1
Heavy Fuel Oil	8,610,704	9.3	125,495	14,610	66.1
Plant Consumption	2,123,288	2.3	39,770	17,900	21.0
TOTAL	92,667,183	100.0	189,776	2,080	100.0

Note: Totals may not add up to due to rounding.

Graph 4.1: National Liquid Fuel Production / Imports in 2004



Graph 4.2: Tonnage of Sulphur in Liquid Fuels in 2004



**TABLE 4.2A:
Fuel Production/Imports and Sulphur Content, Atlantic Region Summary for 2004**

Atlantic Region				
Type of Fuel	Fuel Production / Imports (m ³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	603,842	600	0.123	0.7
Motor Gasoline	2,925,534	95	0.004	0.1
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	NA ¹	27	0.041	0.0
Low-Sulphur Diesel Fuel	1,840,351	580	0.037	0.7
Diesel Fuel	230,672	176	0.089	0.2
Light Fuel Oil	1,577,061	1,789	0.134	2.2
Heavy Fuel Oil	2,837,539	48,381	1.697	59.4
Plant Consumption ³	1,218,830	29,745	2.324	36.5
TOTAL	11,233,829	81,393	0.710	100.0

Notes:

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per note 1
3. Plant consumption in the Atlantic consists mostly of marine fuels (i.e., intermediate fuel oil IFO 30-460), light/heavy fuel oil and import bituminous emulsion product (i.e., ORIMULSION[®]).

**TABLE 4.2B:
Fuel Production/Imports and Sulphur Content, Québec Region Summary for 2004**

Québec Region				
Type of Fuel	Fuel Production / Imports (m ³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1,649,134	610	0.046	1.6
Motor Gasoline	12,004,217	724	0.008	1.9
Aviation Gasoline	40,224	0	0.000	0.0
Kerosene/Stove oil	934,804	326	0.043	0.9
Low-Sulphur Diesel Fuel	6,190,146	1,952	0.038	5.1
Diesel Fuel	196,157	479	0.284	1.3
Light Fuel Oil	1,392,489	2,316	0.194	6.0
Heavy Fuel Oil	2,820,618	30,252	1.082	79.0
Plant Consumption ³	110,093	1,626	1.436	4.2
TOTAL	25,337,882	38,286	0.157	100.0

Notes:

1. Plant consumption in Quebec consists mostly of heavy fuel oil and diesel.

**TABLE 4.2C:
Fuel Production/Imports and Sulphur Content, Ontario Region Summary for 2004**

Ontario Region				
Type of Fuel	Fuel Production / Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	1,507,889	1,086	0.088	2.5
Motor Gasoline	13,274,328	509	0.005	1.2
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	NA ¹	86	0.344	0.2
Low-Sulphur Diesel Fuel	4,797,097	1,282	0.032	3.0
Diesel Fuel	NA ¹	2,567	0.282	6.0
Light Fuel Oil	978,787	1,687	0.198	3.9
Heavy Fuel Oil	1,653,488	27,375	1.669	63.7
Plant Consumption ³	471,281	8,361	1.711	19.5
TOTAL	22,682,870	42,952	0.186	100.0

Notes:

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per note 1
3. Plant consumption in the Ontario consists mostly of liquefied refinery fuel and heavy fuel oil.

**TABLE 4.2D:
Fuel Production/Imports and Sulphur Content, West Region Summary for 2004**

West Region				
Type of Fuel	Fuel Production / Imports (m³)	Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
Aviation Turbo Fuel	3,696,467	1,294	0.043	4.8
Motor Gasoline	13,769,773	604	0.006	2.2
Aviation Gasoline	62,837	4	0.010	0.0
Kerosene/Stove oil	8,569	1	0.017	0.0
Low-Sulphur Diesel Fuel	10,804,780	2,078	0.023	7.7
Diesel Fuel	2,164,087	3,616	0.194	13.3
Light Fuel Oil	NA ¹	24	0.027	0.1
Heavy Fuel Oil	1,299,059	19,487	1.505	71.8
Plant Consumption ³	323,084	37	0.013	0.1
TOTAL	32,128,656	27,145	0.089	100.0

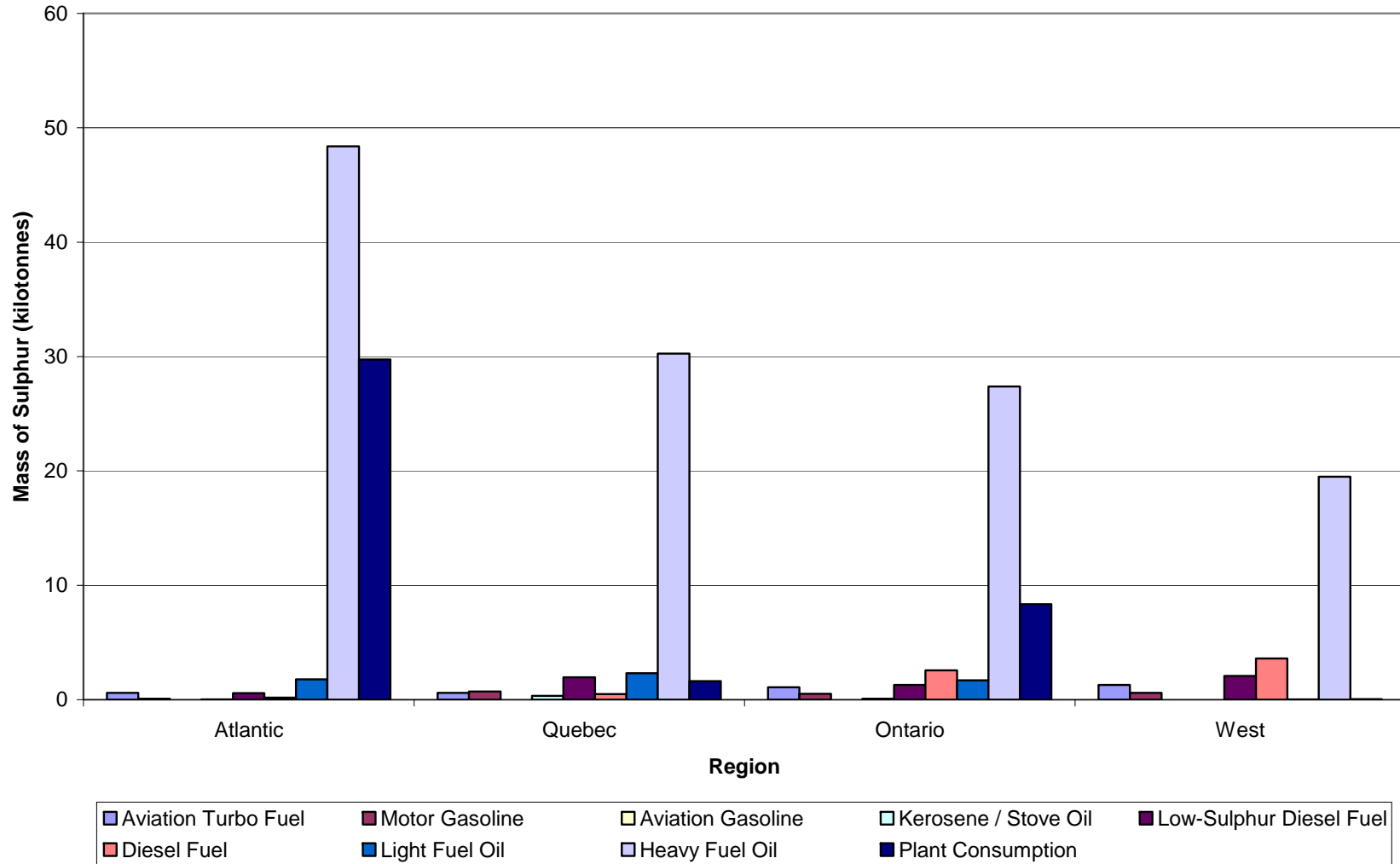
Notes:

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per note 1
3. Plant consumption in the West consists mostly of, light fuel oil, regular and low sulphur diesel.

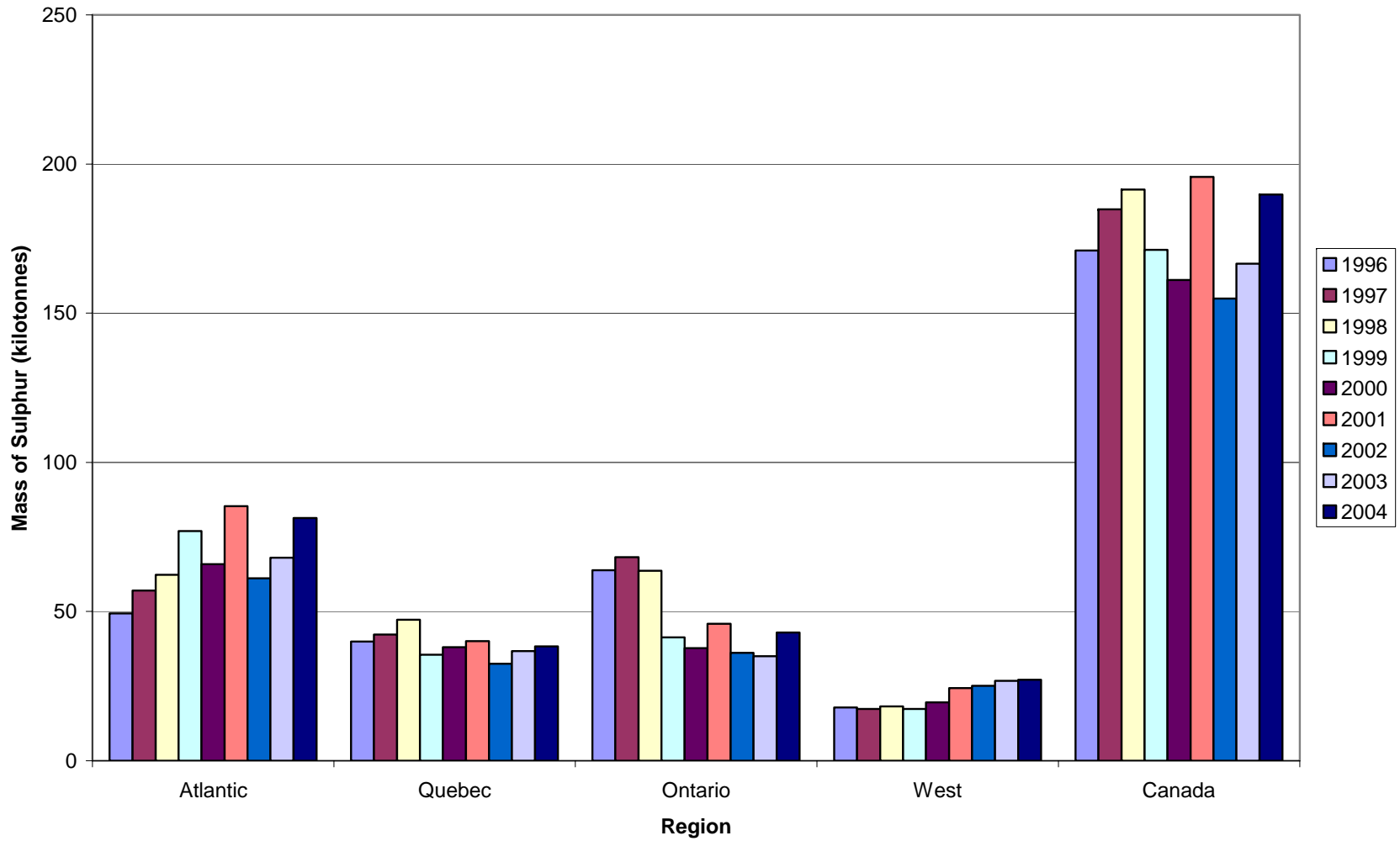
**TABLE 4.2E:
Regional and National Volume Weighted Averages of the Density of Fuels Produced
And Imported in 2004 (kg/m³)**

Type of Fuel	Atlantic	Quebec	Ontario	West	Canada
Aviation Turbo Fuel	810.4	809.8	813.1	813.0	812.1
Motor Gasoline	737.8	733.4	736.6	728.8	733.2
Aviation Gasoline	NA	705.2	NA	700.9	702.6
Kerosene/Stove oil	826.0	820.6	852.5	823.0	821.9
Low-Sulphur Diesel Fuel	843.7	835.2	844.2	850.9	844.9
Diesel Fuel	859.9	861.9	851.3	860.0	857.5
Light Fuel Oil	847.5	856.0	862.1	834.0	853.6
Heavy Fuel Oil	1002.4	989.5	990.2	999.8	995.5
Plant Consumption	1038.1	1023.8	1038.7	841.1	1007.5

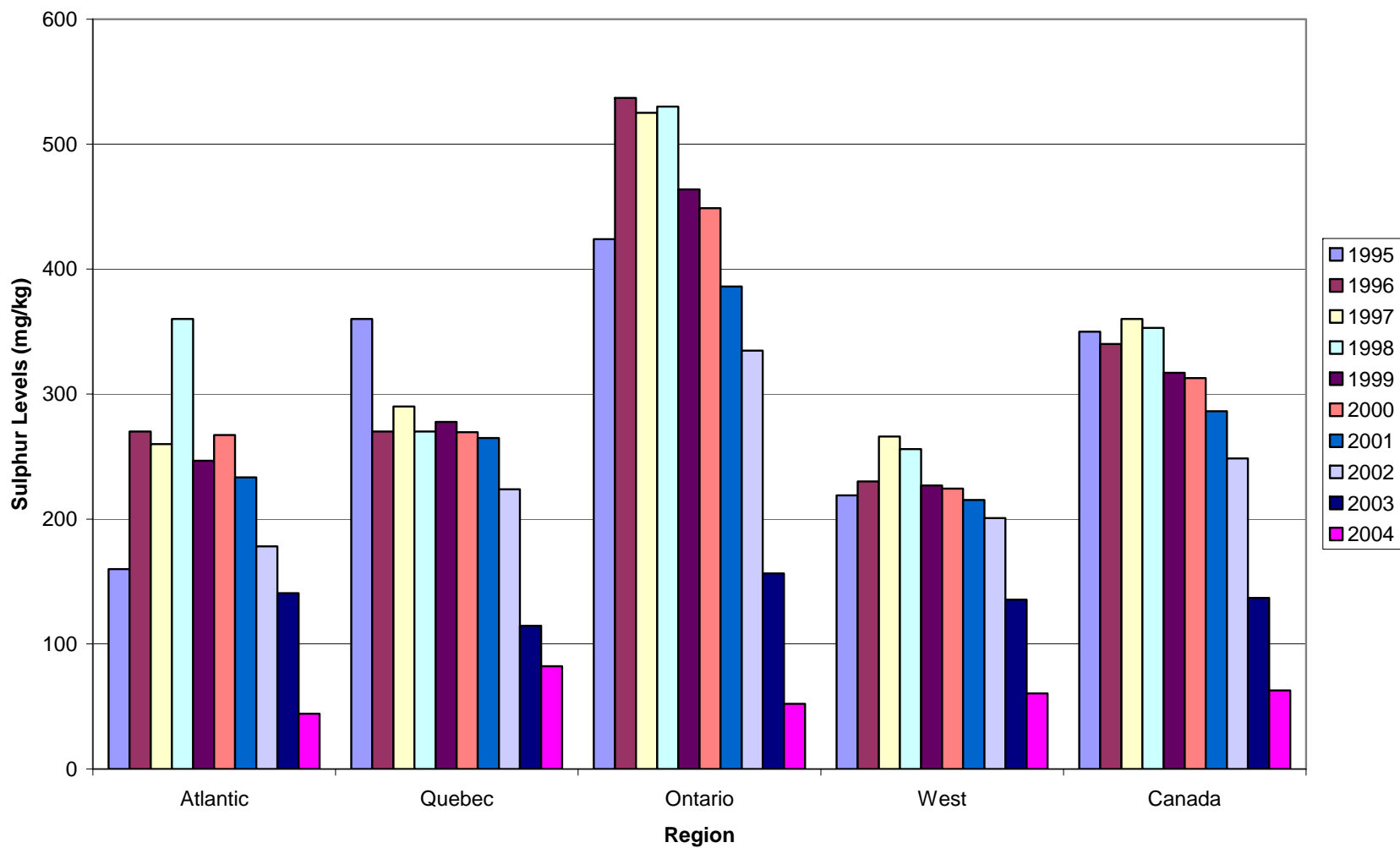
Graph 4.3: Mass of Sulphur in Liquid Fuels Produced or Imported in 2004



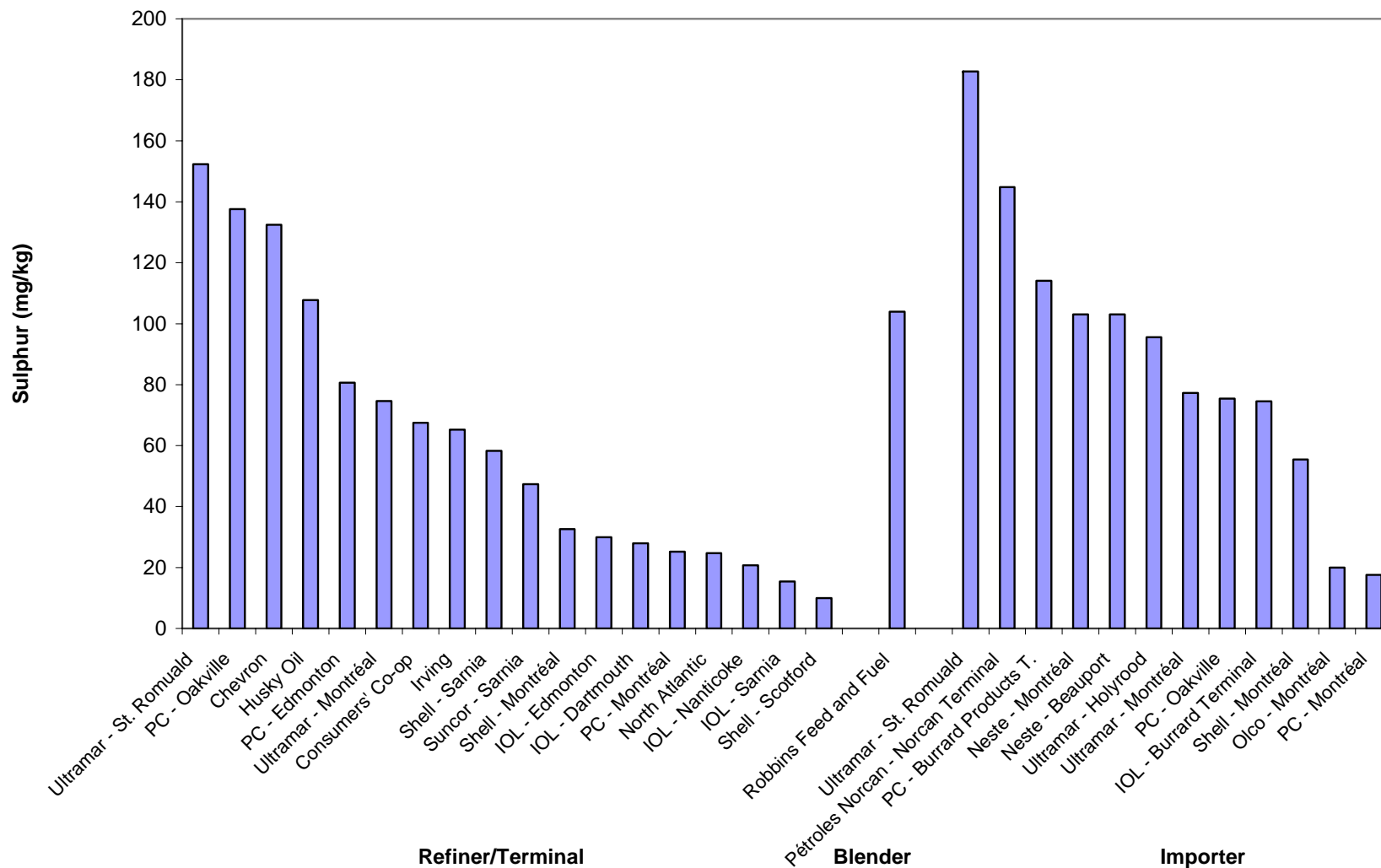
Graph 4.4 : Sulphur Mass in Liquid Fuels by Region, 1996 - 2004



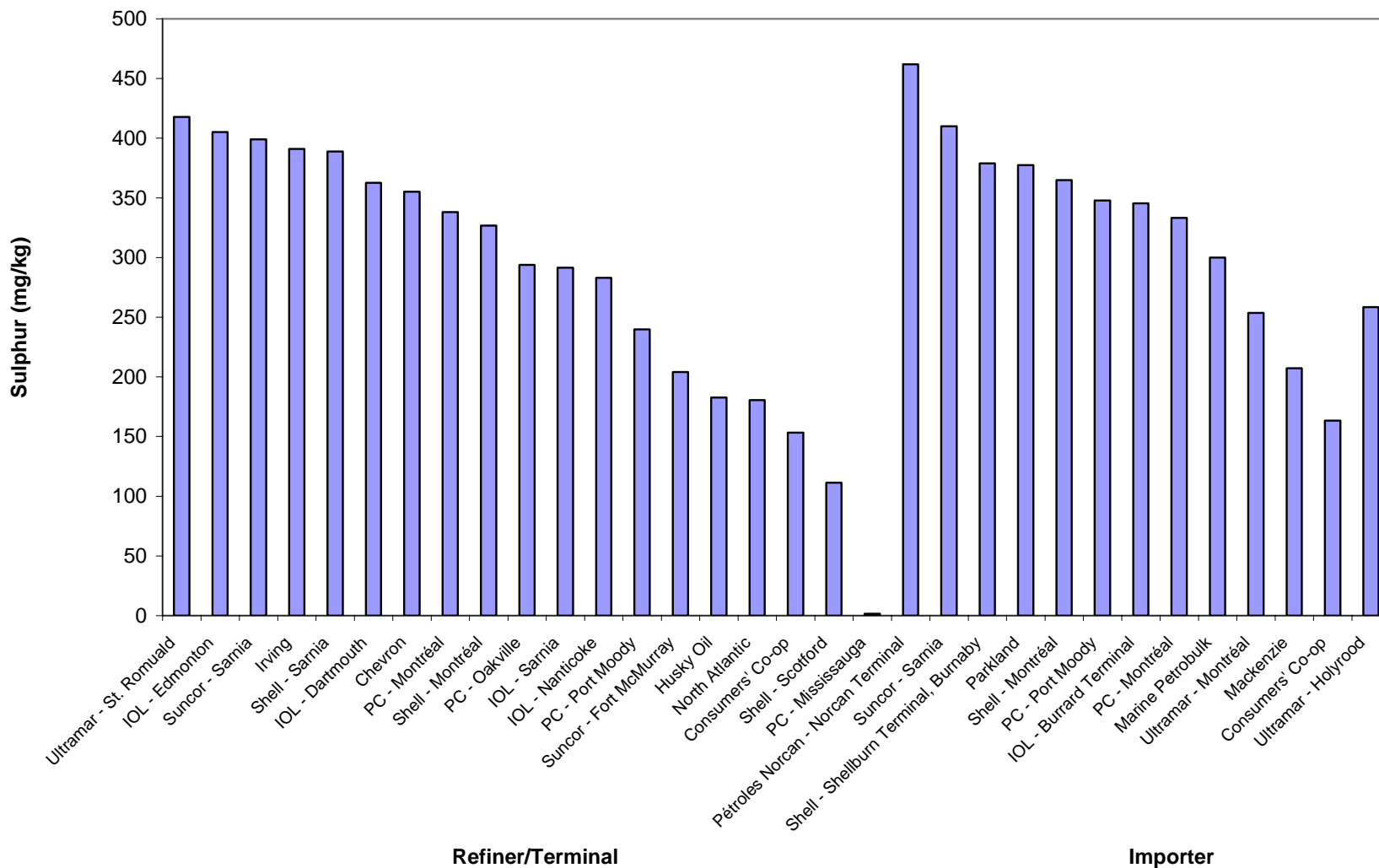
Graph 4.5 : Sulphur Levels in Motor/Aviation Gasoline by Region, 1995 - 2004



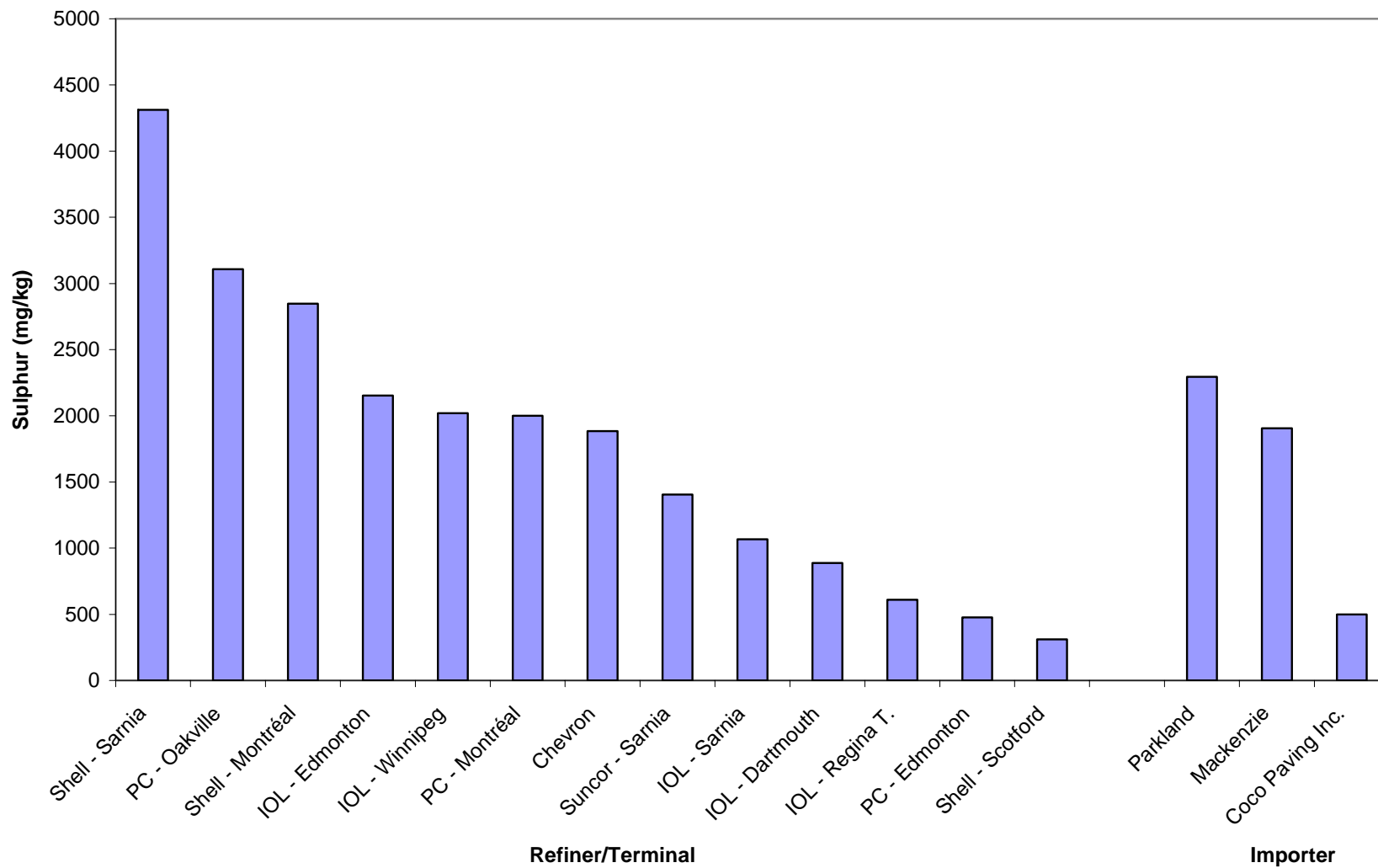
Graph 4.6: Sulphur Levels in Motor Gasoline by Refinery / Importer in 2004



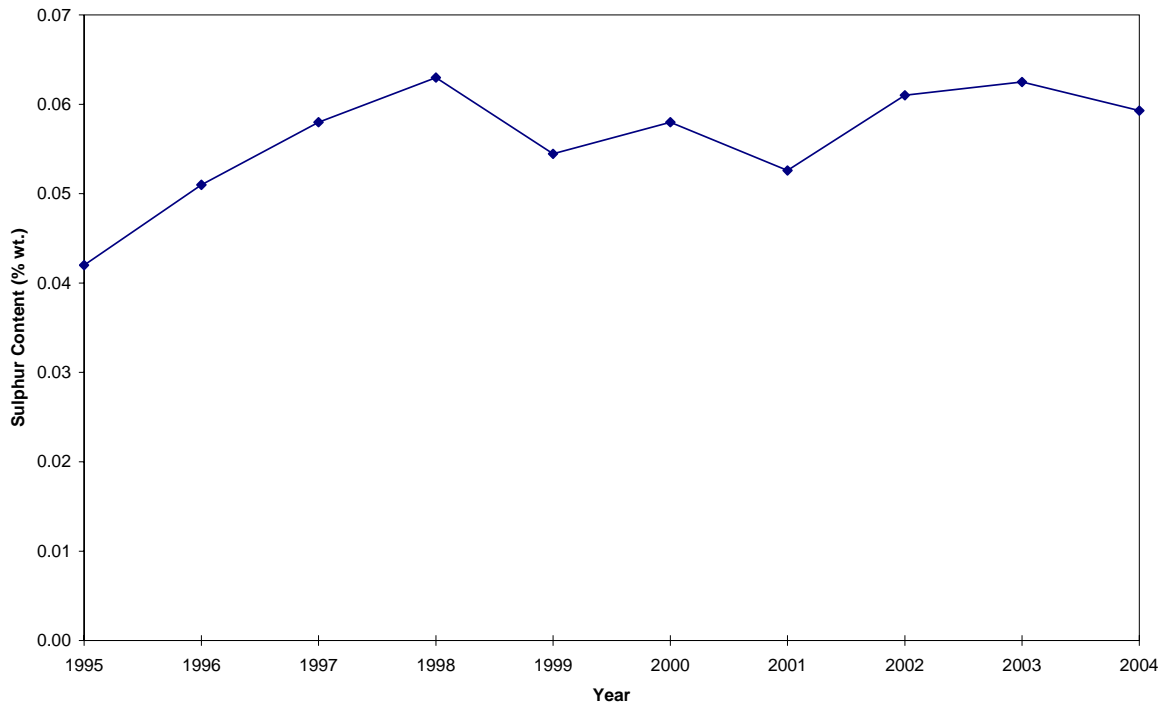
Graph 4.7: Sulphur Levels in Low Sulphur Diesel Fuel by Refinery / Importer in 2004



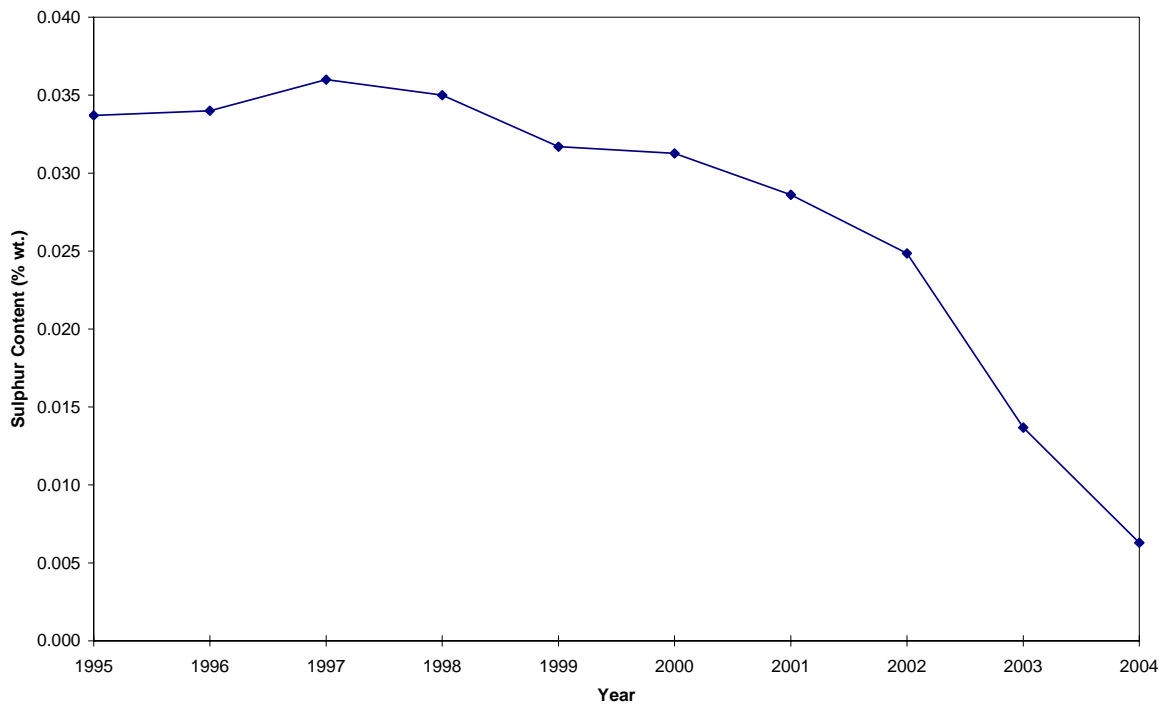
Graph 4.8: Sulphur Levels in Regular Diesel Fuel by Refinery / Importer in 2004



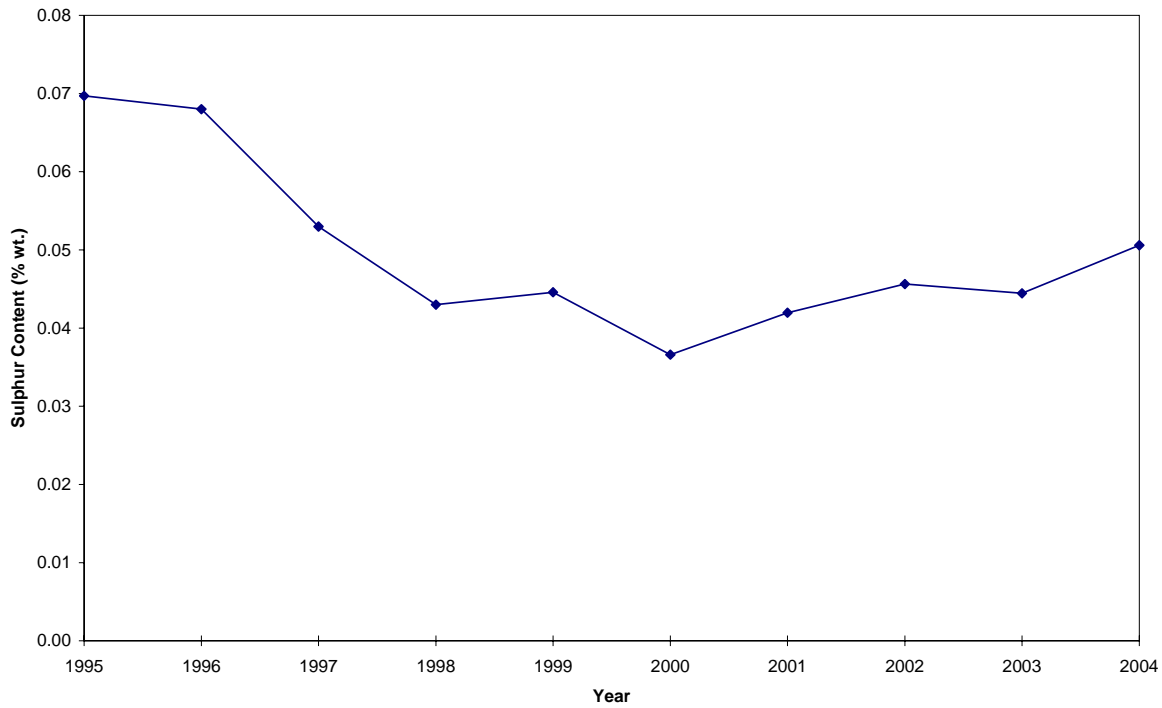
Graph 4.9: 2004 National Trend of Sulphur Content in Aviation Turbo Fuel



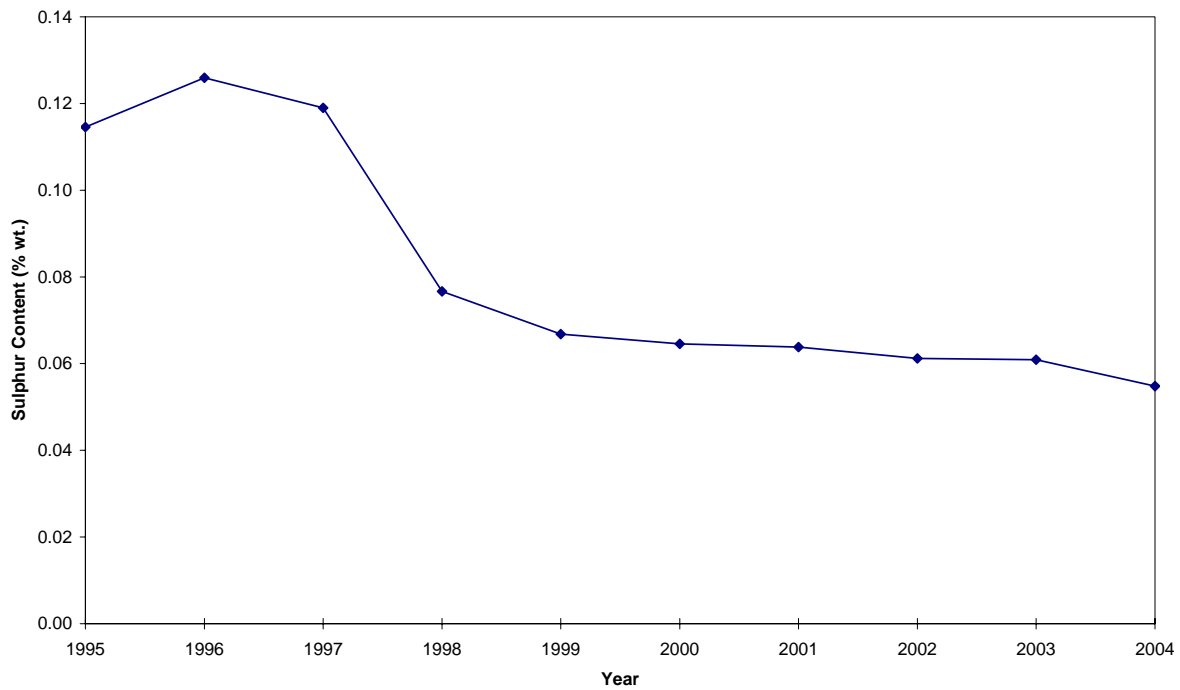
Graph 4.10: 2004 National Trend of Sulphur Content in Motor/Aviation Gasoline



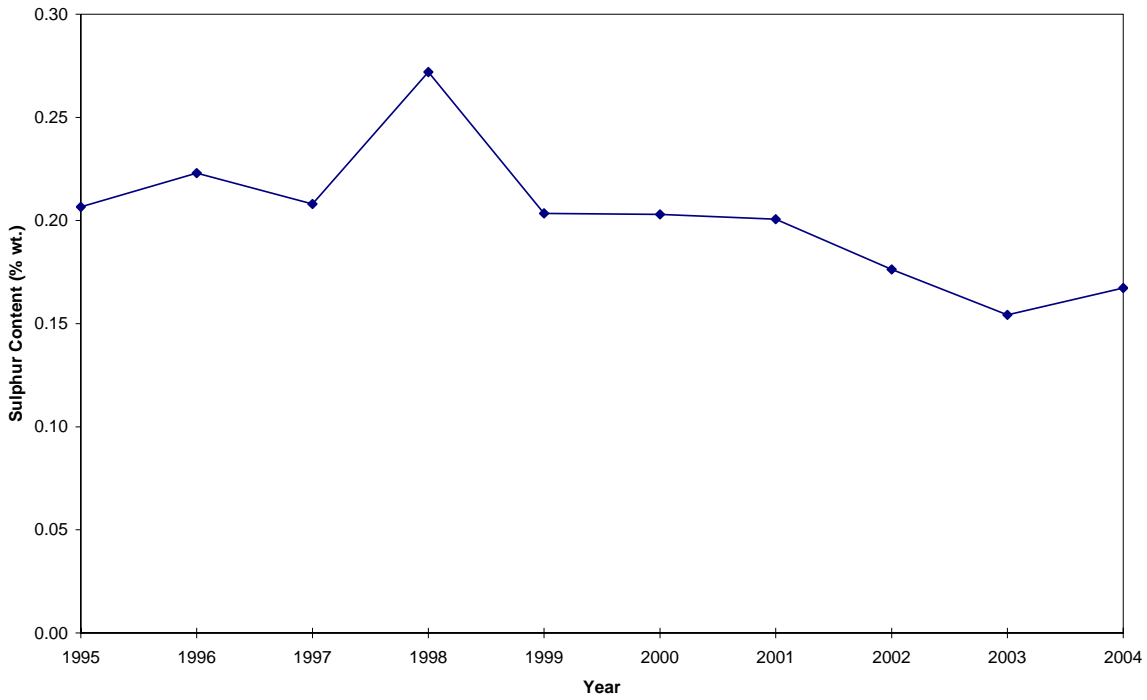
Graph 4.11: 2004 National Trend of Sulphur Content in Kerosene/Stove Oil



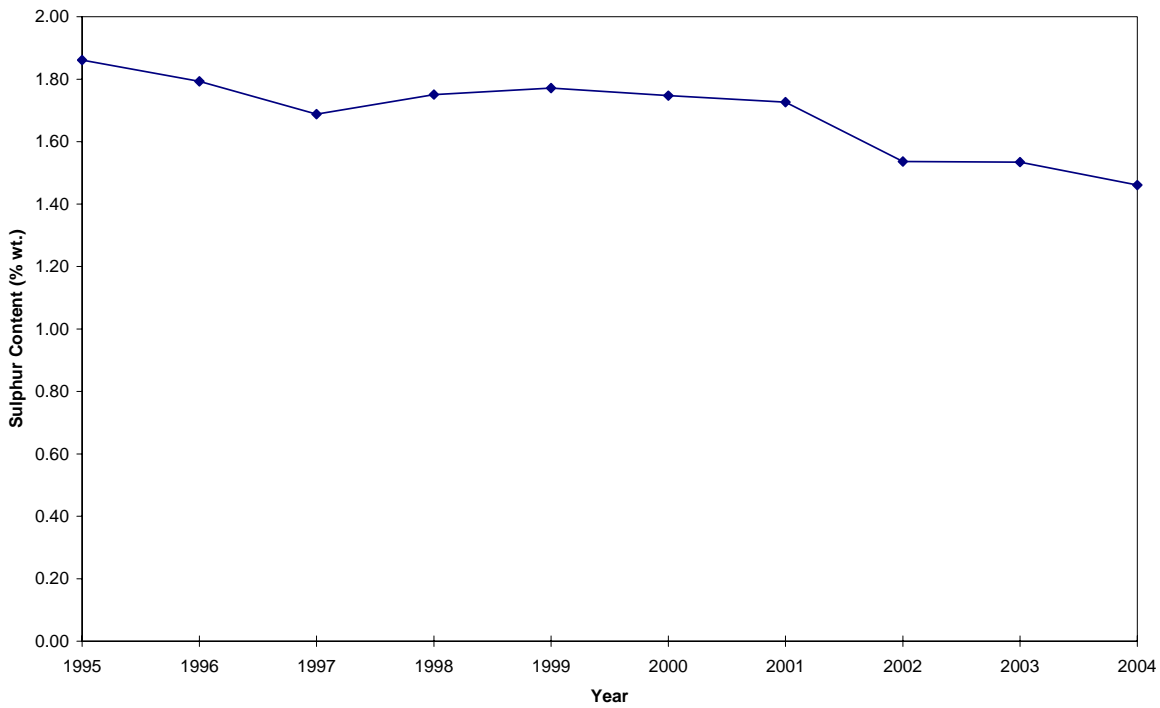
Graph 4.12: 2004 National Trend of Sulphur Content in Diesel Fuel (Total Pool)



Graph 4.13: 2004 National Trend of Sulphur Content in Light Fuel Oil



Graph 4.14: 2004 National Trend of Sulphur Content in Heavy Fuel Oil



Appendix 1

**Web-site References for *Fuels Information Regulations No. 1* and
other Fuels Regulations.**

Oil, Gas and Energy Branch –Home page
http://www.ec.gc.ca/energ/fuels/fuel_home_e.htm

Fuels Information Regulations, No. 1
http://www.ec.gc.ca/energ/fuels/regulations/fuelsreg_e.htm

Sulphur in Gasoline Regulations
http://www.ec.gc.ca/energ/fuels/regulations/sulreg_e.htm

Benzene in Gasoline Regulations
http://www.ec.gc.ca/energ/fuels/regulations/bzreg_e.htm

Contaminated Fuels Regulations
http://www.ec.gc.ca/energ/fuels/regulations/confuelreg_e.htm

Gasoline Regulations
http://www.ec.gc.ca/energ/fuels/regulations/gasreg_e.htm

Gasoline and Gasoline Blend Dispensing Flow Rate Regulations
http://www.ec.gc.ca/energ/fuels/regulations/gasblendreg_e.htm

Sulphur in Diesel Fuels Regulations
http://www.ec.gc.ca/energ/fuels/regulations/dieselreg_e.htm

Appendix 2

Sample Forms for Reporting Sulphur Content under the Regulations:

Fuel Information Regulations, No. 1
Sulphur in Gasoline Regulations
Sulphur in Diesel Fuel Regulations

(2005 Compliance promotion package)

Fuels Information Regulations, No. 1

NOTE: Information contained in this page is for compliance promotional purposes and has no legal status. For requirements under the regulations, refer to the actual regulations.

The *Fuels Information Regulations, No. 1*, require every person who produces or imports **more than 400 cubic metres** (i.e., 400,000 L or 87,988 Imp. gallons) of a liquid fuel such as (but not limited to) aviation turbo fuel, gasoline, kerosene, diesel fuel or fuel oils per year to submit to Environment Canada the following information as outlined in Form 1 and Form 2 described below:

Form 1: Report on Sulphur Content of Liquid Fuels.

The Report on Sulphur Content of Liquid Fuels for each quarter of the calendar year is due on or before January 31st of each year following the year of production or import. (a form is attached for your convenience).

Form 2: Report on Fuel Additives (other than lead or lead compounds) in Petroleum Fuels.

The Report on Fuel Additives in Petroleum Fuels is due within sixty days of selling the fuel. This information does not have to be reported annually once the initial report is made, but any changes in the information regarding additives must be reported within 60 days of any change, including any change in the highest, lowest or weighted average concentration. For the purposes of this report, the weighted average concentration may be calculated over a calendar year. (a form is attached for your convenience). Note: Concentration of the additive in the fuel must be reported, not the concentration of a component of the additive in the fuel.

Please note the change in address for the submission of Form 2: Report on Fuel Additives

SULPHUR IN DIESEL FUEL REGULATIONS

SCHEDULE 1
(Paragraph 5(1)(b))

QUARTERLY REPORT OF SULPHUR CONCENTRATION IN DIESEL FUEL

1. Calendar quarter _____

2. Year _____

3. Name of producer or importer _____

4. Name of the facility in Canada producing diesel fuel or the province of import _____

5. Street address (and mailing address if different) of the facility in Canada producing diesel fuel or of the importer's place of business in Canada _____

6. Volume of diesel fuel, in m³

(a) Diesel fuel with a concentration of sulphur that was less than or equal to 500 mg/kg until May 31, 2006 or that was less than or equal to 15 mg/kg after May 31, 2006

(i) Produced at the facility _____

(ii) Imported into the province _____

(b) Diesel fuel with a concentration of sulphur that exceeded 500 mg/kg until May 31, 2006 or exceeds 15 mg/kg after May 31, 2006

(i) Produced at the facility _____

(ii) Imported into the province _____

7.

(1) Sulphur concentration (mg/kg, or percent by weight if the units are identified), reported separately for diesel fuel produced and diesel fuel imported

(a) Diesel fuel with a concentration of sulphur that was equal to or less than 500 mg/kg until May 31, 2006 or that was equal to or less than 15 mg/kg after May 31, 2006

(i) Highest _____

(ii) Lowest _____

(iii) Volume-weighted average _____

(b) Diesel fuel with a concentration of sulphur that exceeded 500 mg/kg until May 31, 2006 or exceeded 15 mg/kg after May 31, 2006

(i) Highest _____

(ii) Lowest _____

(iii) Volume-weighted average _____

(2) Method used (for reporting purposes) to measure sulphur concentration

8. Authorized official

Name _____

Title _____

Signature and date _____

Telephone number: (____) _____

Fax number: (____) _____

SULPHUR IN GASOLINE REGULATIONS (SOR/99-236)

Note: This form is provided for your convenience in reporting. For reporting details, refer to the Regulations. Section 4 of the federal *Sulphur in Gasoline Regulations* requires that certain information be submitted:

- a) by each primary supplier that produces or imports gasoline identified as low-sulphur gasoline, California gasoline or gasoline-like blend stock as identified under section 5 of the Regulations,
- b) for each refinery and blending facility at which the primary supplier produced the gasoline, for each province into which it imported the gasoline and for each combination which it elected under section 9 of the Regulations,
- c) annually, on or before February 15 of the year following the year for which the report is prepared.

The information should be submitted to the appropriate regional office of Environment Canada.

Registration Number under the <i>Benzene in Gasoline Regulations</i>	Year
Company name	
Company address	

Type of primary supplier (check one or more): Producer at a refinery Producer at a blending facility Importer

Which method has been elected to meet the Sulphur limit? Pool Average Flat
 If pool average, what is the averaging period during the interim period that was elected? annual basis OR 30 month period
If pool average, elected as annual basis, the averaging period is January 1, 2004 to December 31, 2004
If pool average, elected as 30 month period, the averaging period is July 1, 2002 to December 31, 2004
Please note that, once pool average election has been made, it can not be changed part way through an averaging period.

Name and location of the refinery, blending facility or points of importation in the province, covered by this report:

Type of Gasoline	Annual Volume (m ³) (January 1, 2004 to December 31, 2004)		Flat Limit	Pool Average	
	PRODUCED	IMPORTED		Maximum S Concentration in Gasoline (mg/kg)	Volume Weighted average (mg/kg)
1. Low Sulphur Gasoline					
2. California Gasoline				NOT REQ'D	NOT REQ'D
3. Gasoline-Like Blendstock			NOT REQ'D	NOT REQ'D	NOT REQ'D

Authorized Official	Telephone No. () -
Title	Fax No. () -
Signature	Date
Contact Name	Contact Telephone No. () -

ADDRESSES OF ENVIRONMENT CANADA'S REGIONAL OFFICES

Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island

Director
Environmental Protection – Atlantic Region
Environment Canada
45 Alderney Drive
16th floor, Queen Square
Dartmouth, Nova Scotia B2Y 2N6

Quebec

Director
Environmental Protection – Quebec Region
Environment Canada
105 rue McGill, 4th Floor
Montreal, Quebec H2Y 2E7

Ontario

Manager, Emergencies and Enforcement Division
Environment Canada – Ontario Region
Environmental Protection Branch
4905 Dufferin Street, Second floor
Downsview, Ontario M3H 5T4

Manitoba, Saskatchewan, Alberta, NWT and Nunavut

Director
Environmental Protection – Prairies & Northern Region
Environment Canada
Twin Atria #2, 2nd floor
4999 - 98th Avenue
Edmonton, Alberta T6B 2X3

British Columbia and Yukon

Head of Inspections
Environmental Protection – Pacific & Yukon Region
Environment Canada
Suite 201 – 401 Burrard Street
Vancouver, British Columbia V6C 3S5

Appendix 3

Volume Weighted Annual Sulphur Levels by Refiner for 1995 to 2004

Table A3.1a: Volume Weighted Annual Sulphur Levels in Motor Gasoline 1995 - 2004⁹

	Name	City	Sulphur Levels (mg/kg)									
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Refiner/ Terminal	Chevron Canada Limited	Burnaby	215	273	294	246	199	174	171	213	118	132
	Consumers' Co-operative Refineries	Regina	97	179	103	148	187	242	197	178	163	68
	Husky Oil Operations Ltd.	Prince George	183	261	225	282	170	248	239	242	143	108
	Imperial Oil	Dartmouth	365	419	374	491	329	382	356	265	188	28
	Imperial Oil	Edmonton	239	243	346	297	272	252	302	268	165	30
	Imperial Oil	Nanticoke	340	506	530	529	450	456	376	366	208	21
	Imperial Oil	Sarnia	728	787	712	792	694	693	596	432	190	15
	Irving Oil Limited	Saint-John	71	35	43	129	96	85	48	50	67	65
	North Atlantic Refining Limited	Come-by-Chance	38	75	118	76	55	47	49	58	29	25
	Parkland Refining Limited	Bowden	-	1	1	4	4	8	4	-	-	-
	Petro-Canada	Edmonton	360	380	394	377	311	311	250	202	167	81
	Petro-Canada	Montréal	472	356	387	316	367	292	320	275	218	25
	Petro-Canada	Oakville	528	489	519	514	523	479	396	305	133	138
	Shell Canada	Sarnia	553	579	582	567	453	466	462	399	52	58
	Shell Canada	Scotford	50	50	50	50	50	50	49	50	7	10
	Shell Canada	Montréal	392	319	333	312	269	318	280	231	38	33
	Suncor Energy Products Incorporated	Sarnia	368	276	298	301	209	192	180	196	157	47
	Ultramar Limitée	Lévis // St-Romuald	219	174	186	171	173	218	212	188	104	152
Ultramar Limitée	Montréal	-	-	-	-	-	-	-	155	90	75	
Blender	Robbins Feed and Fuel	Allanburg	-	-	-	137	271	239	307	222	120	104
	BP West Coast Products, LLC	Blaine	-	-	-	70	103	105	110	100	-	-
	Delta Western Fuel (Totem Oil)	Whitehorse	-	-	-	610	73	236	-	-	-	-
	Ford Motor Company of Canada	Windsor	-	-	-	-	-	28	22	28	18	-
	Husky Oil Operations Ltd.	Prince George	-	-	-	80	-	-	-	-	-	-
	Imperial Oil	Burnaby	-	-	-	210	-	-	63	63	-	-
	Imperial Oil	Burrard	-	-	-	-	-	-	-	-	-	74
	Imperial Oil	Montréal	-	-	-	-	340	-	-	-	-	-
	Mackenzie Petroleum Limited	Dawson City	-	-	-	170	301	280	234	234	-	-
	Murphy Oil USA	Superior	-	-	-	540	430	-	-	-	-	-
	Neste Petroleum	Beauport	-	-	-	-	-	-	386	400	-	103
	Neste Petroleum	Montréal	-	-	-	-	-	-	361	222	-	103
	Northern Transportation	Iqaluit	-	-	-	100	310	107	743	43	-	-
	Olco Petroleum Group	Hamilton	-	-	-	410	540	394	317	307	-	-
	Olco Petroleum Group	Montréal	-	-	-	457	511	299	-	-	-	20
	PaceSetter Enterprises	Whitehorse	-	-	-	-	246	220	-	-	-	-
	Parkland Refining Limited	Bowden	-	-	-	110	18	18	82	265	-	-
	Petro-Canada	Montréal	-	-	-	340	360	-	420	315	230	18
	Petro-Canada	Oakville	-	-	-	610	520	490	368	-	-	75
	Petro-Canada, Burrard Products T.	Port Moody	-	-	-	-	-	-	-	-	-	114
	Petro-Canada	Port Moody	-	-	-	210	321	-	-	-	70	-
	Pétroles Norcan	Montréal	-	-	-	470	560	273	243	196	100	145

⁹ For the years 1995 to 2000, sulphur levels for motor gasoline were averaged with levels for aviation gasoline. Post-2000, the values are for sulphur in motor gasoline only.

Table A3.1a: Volume Weighted Annual Sulphur Levels in Motor Gasoline 1995 – 2004 (cont'd)

	Name	City	Sulphur Levels (mg/kg)									
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	Robbins Feed and Fuel	Allanburg	-	-	-	140	270	-	-	-	120	-
	Shell Canada	Montréal-East	392	313	333	312	269	318	280	231	36	55
	TransCanada Energy	Calgary	-	-	-	100	500	-	-	-	-	-
	Ultramar Ltd	Holyrood	-	-	-	-	-	-	-	-	180	96
	Ultramar Ltd	Lévis // St-Romuald	-	-	-	120	300	270	262	140	104	183
	Ultramar Ltd	Montréal	-	-	-	-	-	-	-	170	90	77
National Average			345	340	360	350	320	310	290	246	121	63

**Table A3.1b: Volume-Weighted Annual Sulphur Level in Motor Gasoline for 2004
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner/ Terminal	Chevron Canada Ltd	Burnaby	137	151	138	105	132
	Consumers' Co-operative Refineries Ltd	Regina	109	96	44	21	68
	Husky Oil Operations Ltd.	Prince George	140	120	100	70	108
	Imperial Oil	Dartmouth	31	29	21	31	28
	Imperial Oil	Nanticoke	18	20	19	26	21
	Imperial Oil	Sarnia	14	25	12	10	15
	Imperial Oil	Edmonton	40	31	30	19	30
	Irving Oil Ltd	Saint-John	59	72	82	45	65
	North Atlantic Refining Ltd	Come-by-Chance	17	26	38	25	25
	Petro-Canada	Edmonton	153	160	19	9	81
	Petro-Canada	Montréal	37	16	34	16	25
	Petro-Canada	Oakville	133	148	164	87	138
	Shell Canada	Montréal-	34	61	22	23	33
	Shell Canada , Sarnia Manufacturing Centre	Sarnia	43	64	68	59	58
	Shell Canada	Scotford	9	9	11	11	10
	Suncor Energy Products Incorporated	Sarnia	37	100	28	28	47
Ultramar Ltd	Montréal	100	70	90	27	75	
Ultramar Ltd	Lévis // St-Romuald	99	208	190	124	152	
Blender	Robbins Feed and Fuel	Allanburg	113	118	95	82	104
Importer	Imperial Oil	Burrard	0	63	85	0	74
	Neste Petroleum	Beauport	0	103	0	0	103
	Neste Petroleum	Montréal Est	0	0	0	103	103
	Olco Petroleum Group	Montréal	20	0	0	0	20
	Petro-Canada, Burrard Products T.	Port Moody	111	122	98	0	114
	Petro-Canada	Montréal	37	16	34	16	18
	Petro Canada	Oakville	133	148	164	87	75
	Petroles Norcan	Montréal	300	139	119	87	145
	Shell Canada	Montréal	34	61	22	23	55
	Ultramar Ltd	Holyrood	160	100	20	0	96
	Ultramar Ltd	Montréal	100	70	90	27	77
	Ultramar Ltd	Lévis // St-Romuald	99	207	189	124	183
National Average			69	83	60	41	63

* Only the annual average was reported.

Appendix 3.2a: Volume Weighted Annual Sulphur Levels in Low-Sulphur Diesel 1995 - 2004

	Name	City	Sulphur Levels (mg/kg)									
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Refinery / Terminal	Chevron Canada Limited	Burnaby	350	390	380	400	400	400	389	490	400	355
	Consumers' Co-operative Refineries Ltd.	Regina	200	270	250	230	220	190	211	211	190	153
	Husky Oil Operations Ltd.	Prince George	140	200	200	210	190	190	188	165	240	183
	Imperial Oil, Calgary Terminal	Calgary	-	-	-	-	-	-	-	-	-	320
	Imperial Oil	Dartmouth	340	360	390	400	330	370	402	397	400	363
	Imperial Oil	Edmonton	290	400	410	380	430	400	420	409	400	405
	Imperial Oil	Nanticoke	-	-	160	290	280	310	356	322	285	283
	Imperial Oil	Sarnia	-	-	420	290	410	350	349	371	340	292
	Irving Oil Limited	Saint-John	400	400	440	450	440	430	433	432	420	391
	Newalta	North Vancouver	-	-	-	-	-	-	-	-	-	-
	North Atlantic Refining Limited	Come-by-Chance	-	-	490	130	330	260	148	163	190	180
	Petro-Canada	Edmonton	190	220	210	230	240	280	283	256	280	240
	Petro-Canada Lubricants	Mississauga	10	20	20	20	20	20	20	20	85	1
	Petro Canada	Montréal	340	420	330	400	400	430	451	422	400	338
	Petro-Canada	Oakville	-	-	170	320	300	300	278	222	245	294
	Shell Canada	Montréal	390	370	210	280	360	350	378	344	365	327
	Shell Canada	Sarnia	330	340	360	360	370	390	392	400	390	389
	Shell Canada	Scotford	50	80	100	210	140	150	196	129	130	111
	Suncor	Fort McMurray	70	90	140	160	200	250	225	225	220	204
	Suncor	Sarnia	340	300	370	460	450	440	437	425	420	399
Ultramar	Lévis // St-romuald	450	380	400	410	430	420	420	424	412	418	
Blender	Robbins Feed and Fuel	Allanburg	-	-	-	-	-	410	-	-	-	-
	BP West Coast Products	Blaine	-	-	-	380	380	360	339	400	-	-
	Coco Paving Inc.	Windsor	-	-	-	-	-	-	-	-	-	-
	Consumers' Co-operative Refineries	Regina	-	-	-	-	-	-	-	-	-	163
	Daigle Oil Limited	Edmundston	-	-	-	-	-	500	500	-	160	-
	Delta Western Fuel (Totem Oil)	Whitehorse	-	-	-	160	400	430	-	-	-	-
	Husky Oil Operations Ltd.	Prince George	-	-	-	380	-	-	-	-	-	-
	Imperial Oil, Burrard T.	Burnaby	-	-	-	230	-	360	345	-	425	345
	Mackenzie Petroleum Limited	Dawson City	-	-	-	300	400	450	400	398	385	207
	Marine Petrobulk Limited.	North Vancouver	-	-	-	-	-	-	-	200	270	300
	Murphy Oil USA	Superior	-	-	-	270	270	-	-	-	-	-
	Northern Transportation	Iqaluit	-	-	-	20	210	270	271	255	-	-
	Olco Petroleum Group	Beauport	-	-	-	400	310	-	-	-	-	-
	Olco Petroleum Group	Montréal	-	-	-	-	310	-	-	-	-	-
	Parkland Refining Limited	Bowden	-	-	-	400	500	480	500	448	445	378
	Petro-Canada	Montréal	-	-	-	390	400	400	473	500	-	333
	Petro-Canada	Oakville	-	-	-	310	-	-	-	-	-	-
	Petro-Canada, Burrard Products T.	Port Moody	-	-	-	-	-	360	251	-	375	348
	Pétroles Norcan	Montréal	-	-	-	450	450	-	-	-	-	462
	Robbins Feed and Fuel	Allanburg	-	-	-	-	-	-	289	-	-	-
	Shell Canada, Shelburn T.	Burnaby	-	-	-	-	-	-	-	-	-	379
	Shell Canada	Montréal	-	-	-	-	-	-	-	-	-	365
	Suncor	Sarnia	-	-	-	-	-	-	-	430	-	410
	Ultramar Ltd	Montréal-Est	-	-	-	-	-	-	-	440	-	254
	Ultramar Ltd	Lévis // St-Romuald	-	-	-	410	430	410	412	-	-	-
Ultramar Ltd	Halifax	-	-	-	-	-	-	-	-	320	-	
Ultramar Ltd	Holyrood	-	-	-	-	-	-	-	-	400	258	
United Refining Company	Warren	-	-	-	-	-	-	282	286	300	-	
National Average			210	260	270	310	320	330	340	324	317	295

**Table A3.2b: Volume-Weighted Annual Sulphur Level in Low-Sulphur Diesel for 2004
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refinery / Terminal	Chevron Canada Ltd	Burnaby	350	348	360	360	355
	Consumers' Co-operative Refineries Ltd	Regina	128	136	223	131	153
	Husky Oil Operations Ltd.	Prince George	30	380	340	80	183
	Imperial Oil , Calgary Terminal	Calgary	320	-	-	-	320
	Imperial Oil	Dartmouth	370	350	360	370	363
	Imperial Oil	Nanticoke	270	290	330	240	283
	Imperial Oil	Sarnia	210	330	310	320	292
	Imperial Oil	Edmonton	410	400	400	410	405
	Irving Oil Limited	Saint-John	373	382	424	378	391
	North Atlantic Refining Ltd	Come-by-Chance	272	143	170	70	180
	Petro-Canada	Edmonton	240	340	229	170	240
	Petro-Canada	Mississauga	3	1	1	1	1
	Petro-Canada	Montréal	352	312	377	317	338
	Petro-Canada	Oakville	242	293	353	283	294
	Shell Canada	Montréal-Est	347	365	325	297	327
	Shell Canada	Corunna	388	411	401	358	389
	Shell Canada	Fort Saskatchewan	125	147	95	82	111
	Suncor	Fort McMurray	202	210	227	175	204
	Suncor	Sarnia	400	410	410	380	399
	Ultramar Ltd	Lévis // St-Romuald	430	430	410	400	418
Importer	Consumers' Co-operative Refineries Ltd	Regina	128	136	223	131	163
	Imperial Oil, Burrard T.	Burnaby	440	393	0	3	345
	Mackenzie Petroleum Ltd	Dawson City	120	40	377	255	207
	Marine Petrobulk Ltd	North Vancouver	0	0	300	300	300
	Parkland Refining Ltd	Bowden	100	427	376	376	378
	Petro-Canada, Burrard Products T	Port Moody	428	3	0	13	348
	Petro-Canada	Montréal	352	312	377	317	333
	Pétroles Norcan	Montréal	0	0	0	462	462
	Shell Canada	Montréal	347	365	325	297	365
	Shell Canada	Burnaby	0	0	0	379	379
	Suncor	Sarnia	400	410	410	380	410
	Ultramar Ltd	Holyrood	180	0	0	400	258
	Ultramar Ltd	Montréal-Est	240	0	0	290	254
National Average			287	319	308	270	295

* Only the annual average was reported.

Table A3.3a: Volume-Weighted Annual Sulphur Level in Regular Diesel 1995-2004

	Name	City	Sulphur Levels (mg/kg)									
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Refinery / Terminal	Chevron Canada Ltd	Burnaby	1,680	2,670	4,140	3,750	4,050	3,110	3,290	3,648	3,518	1,885
	Husky Oil Operations Ltd.	Prince George	570	580	-	-	-	-	-	-	-	-
	Imperial Oil	Dartmouth	2,010	1,460	1,840	890	510	740	989	656	944	887
	Imperial Oil	Edmonton	1,820	2,100	1,980	2,100	2,140	2,170	2,495	2,253	2,218	2,154
	Imperial Oil	Nanticoke	3,480	3,880	4,300	-	-	-	-	-	-	-
	Imperial Oil, Regina Terminal	Saskatchewan	-	-	-	-	-	-	-	-	-	610
	Imperial Oil	Sarnia	660	690	-	-	-	1,430	1,297	1,154	-	1,067
	Imperial Oil, Winnipeg Distribution T.	Winnipeg	-	-	-	-	-	-	-	-	-	2,020
	Irving Oil Ltd	Saint-John	1,820	1,840	1,750	2,150	1,700	1,690	-	-	-	-
	North Atlantic Refining Ltd	Come-by-Chance	2,320	1,270	1,100	4,220	-	1,100	485	-	1,273	-
	Parkland Refining Ltd	Bowden	5,650	5,680	4,620	4,730	3,880	4,820	3,781	-	-	-
	Petro-Canada	Edmonton	-	-	-	-	-	-	-	-	512	477
	Petro-Canada	Montréal	2,910	3,720	3,540	2,430	5,330	3,510	3,071	2,044	1,600	2,000
	Petro-Canada	Oakville	3,570	3,500	3,810	3,720	3,160	2,990	2,839	3,216	3,026	3,107
	Shell Canada	Sarnia	4,050	4,040	4,200	4,090	3,720	3,780	3,676	3,658	4,389	4,313
	Shell Canada	Scotford	-	-	270	-	480	470	-	-	441	310
	Shell Canada	Montréal	2,060	2,230	1,900	3,020	2,470	2,110	2,431	2,050	2,153	2,847
	Suncor	Sarnia	1,290	1,620	2,370	2,650	2,010	2,300	2,291	1,958	1,667	1,404
Ultramar Ltd	Lévis // St-Romuald	800	760	860	-	-	-	-	-	-	-	
Importer	Daigle Oil Ltd	Edmundston	-	-	-	-	-	1750	-	-	-	-
	Mackenzie Petroleum	Dawson Ville	-	-	-	4,730	3,730	4,130	3,592	4,100	2,967	1,905
	Marine Petrobulk	Vancouver	-	-	-	-	-	-	500	-	-	-
	Murphy Oil USA	Superior	-	-	-	2,900	820	-	-	-	-	-
	North 60 Petro	Whitehorse	-	-	-	-	-	2,710	-	-	-	-
	Northern Transportation	Iqaluit	-	-	-	800	-	1,840	-	-	-	-
	Parkland	Bowden	-	-	-	4,730	3,500	4,780	3,621	4,074	2,850	2,294
	Petro Canada, Burrard T.	Port Moody	-	-	-	-	490	-	-	-	-	-
	Petro-Canada	Oakville	-	-	-	3,700	2,510	3,030	2,812	-	-	-
	National Average			2,150	2,360	2,580	2,990	2,300	2,170	2,480	2,467	2,120

**Table A3.3b: Volume-Weighted Annual Sulphur Level in Regular Diesel for 2004
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				Annual
			Q1	Q2	Q3	Q4	
Refinery/ Terminal	Chevron Canada Limited	Burnaby	2,900	370	3,330	2,820	1,885
	Imperial Oil	Dartmouth	750	1,270	790	730	887
	Imperial Oil	Edmonton	1,480	3,060	2,690	1,620	2,154
	Imperial Oil	Sarnia	-	-	1,060	1,090	1,067
	Imperial Oil, Regina Terminal	Saskatchewan	-	610	-	-	610
	Imperial Oil, Winnipeg Distribution Terminal	Winnipeg	-	2,070	2,340	1,250	2,020
	North Atlantic Refining Limited	Come-by-Chance	-	-	1,060	1,090	1,067
	Petro-Canada	Edmonton	640	600	-	324	477
	Petro-Canada	Montréal	2,000	-	-	-	2,000
	Petro-Canada	Oakville	2,747	3,469	3,541	2,281	3,107
	Shell Canada	Montréal	1,997	2,758	3,322	3,028	2,847
	Shell Canada	Sarnia	3,645	4,345	4,776	4,365	4,313
	Shell Canada	Scotford	307	330	227	-	310
	Suncor	Sarnia	1,50	1,70	1,370	1,860	1,404
Importer	Coco Paving	Windsor	500	500	500	500	500
	Mackenzie Petroleum Limited	Dawson City	724	709	2,913	1,389	1,905
	Parkland Refining Limited	Bowden	2,370	3,276	2,278	1,505	2,294
National Average			1,735	2,353	2,746	1,857	2,180

* Only the annual average was reported.

Table A3.4a: Volume-Weighted Annual Sulphur Level in Light Fuel Oil 1995-2004

			Sulphur Levels (mg/kg)									
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Refiner	Husky Oil Operations Ltd.	Prince George	-	-	514	599	590	600	599	703	403	274
	Imperial Oil	Dartmouth	2,125	2,004	1,928	1,360	940	1,230	1,168	1,037	1,030	1,094
	Imperial Oil	Nanticoke	2,950	3,189	3,327	1,791	2,000	1,950	1,269	-	2,770	-
	Imperial Oil	Sarnia	1,668	1,803	1,417	2,260	1,830	1,690	2,277	2,047	1,414	2,279
	Irving Oil Ltd	Saint-John	-	-	1,731	2,080	1,770	1,660	1,630	1,553	1,304	1,740
	North Atlantic Refining Ltd	Come-by-Chance	-	-	-	-	-	-	-	1,282	860	1,176
	NOVA Chemicals Canada Ltd	Corunna	1,520	1,450	1,550	1,850	1,770	1,450	1,449	1,252	1,117	1,063
	Petro-Canada	Montréal	2,577	3,591	2,753	3,336	3,360	3,470	3,129	2,509	2,400	2,298
	Petro-Canada	Oakville	3,642	4,069	3,663	4,253	4,120	3,650	3,368	3,819	3,710	3,433
	Shell Canada	Corunna	3,000	-	-	-	-	-	-	-	-	-
	Shell Canada	Montréal	2,357	2,256	2,784	2,837	2,720	2,770	2,895	2,291	2,467	2,814
	Suncor	Sarnia	1,591	1,758	2,144	2,578	2,190	2,960	1,810	2,376	1,653	1,500
	Ultramar Ltd	Lévis // St-Romuald	1,120	1,281	1,355	2,231	1,810	1,630	1,539	1,215	1,018	1,086
	Importer	Daigle Oil Ltd	Edmundston	-	-	-	-	-	3,000	3,000	3,000	3,000
North 60 Petroleum Limited		Whitehorse	-	-	-	1,000	1,000	1,000	2,700	-	-	-
Olco Petroleum Group		Beauport	-	-	-	-	2,300	-	-	-	-	-
Olco Petroleum Group		Montréal	-	-	-	-	2,300	-	-	-	-	-
Petro-Canada		Oakville	-	-	-	3,880	3,880	-	3,440	3,600	-	-
Pétroles Norcan		Montréal	-	-	-	-	-	-	-	-	2,740	-
Port Colborne Quarries Limited		Port Colborne	-	-	-	-	-	-	-	-	1,024	1,274
Statia Terminals Canada		Point Tupper	-	-	-	-	-	-	1,020	-	-	-
Ultramar Ltd		Lévis // St-Romuald	-	-	-	-	-	-	1,643	-	-	-
National Average			1,980	2,150	2,000	2,270	2,030	2,030	1,890	1,763	1,794	1,673

Table A3.4b: Volume-Weighted Annual Sulphur Level in Light Fuel Oil for 2004

(Reported by quarters)

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Husky Oil Operations Ltd.	Prince George	50	450	340	40	274
	Imperial Oil	Dartmouth	950	1,600	1,310	950	1,094
	Imperial Oil	Sarnia	2,020	2,670	2,120	2,400	2,279
	Irving Oil Ltd	Saint-John	1,433	1,790	2,266	1,793	1,740
	North Atlantic Refining Ltd	Come-by-Chance	1,430	2,390	413	167	1,176
	NOVA Chemicals Canada Ltd	Corunna	968	1,081	1,098	1,086	1,063
	Petro-Canada	Montréal	2,060	2,220	2,510	2,700	2,298
	Petro-Canada	Oakville	3,301	3,653	3,830	3,348	3,433
	Shell Canada	Montréal	2,500	2,800	3,300	3,000	2,814
	Suncor Incorporated	Sarnia	0	1,500	0	0	1,500
	Ultramar Ltd	Lévis // St-Romuald	1,350	550	1,220	1,100	1,086
Importer	Port Colborne Quarries Limited	Port Colborne	1,210	1,100	1,280	1,460	1,274
National Average			1,600	1,716	1,584	1,781	1,673

* Only the annual average was reported.

Table A3.5a: Volume-Weighted Annual Sulphur Level in Heavy Fuel Oil 1995-2004

			Sulphur Levels (mg/kg)									
	Name	City	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Refiner	Chevron Canada Ltd	Burnaby	14,663	17,832	15,153	15,107	17,880	-	-	-	-	-
	Consumers' Co-operative Refineries Limited	Regina	8,313	12,315	11,207	8,986	8,870	10,640	7,032	9,122	8,742	5,531
	Husky Oil Operations Ltd.	Prince George	26,300	16,636	13,800	19,549	20,340	17,200	14,818	16,976	21,185	23,878
	Imperial Oil	Dartmouth	14,698	13,590	12,664	15,820	13,540	14,130	14,959	12,553	13,778	14,836
	Imperial Oil	Edmonton	15,302	15,080	15,493	13,697	12,660	12,930	13,864	13,598	14,378	14,014
	Imperial Oil	Nanticoke	23,022	23,325	25,815	27,319	22,780	17,030	14,610	12,613	11,291	17,208
	Imperial Oil	Sarnia	21,970	20,153	21,840	22,530	19,900	17,980	19,465	14,922	17,845	19,000
	Irving Oil Ltd	Saint-John	20,850	18,612	18,396	18,409	17,800	16,270	17,454	15,917	16,781	13,471
	Newalta	North Vancouver	-	-	-	-	-	-	-	-	-	-
	North Atlantic Refining Ltd	Come-by-Chance	17,876	22,302	28,323	26,460	28,070	28,410	26,267	-	-	21,500
	NOVA Chemicals Canada Ltd	Corunna	11,840	11,990	13,520	14,690	13,870	11,750	11,751	12,411	11,584	11,990
	Petro-Canada	Edmonton	23,009	26,568	25,890	23,736	22,160	24,500	22,128	21,219	19,600	15,821
	Petro-Canada	Montréal	20,644	22,130	21,072	19,730	15,450	18,810	17,034	16,348	15,100	12,458
	Petro-Canada	Oakville	14,702	15,029	15,848	16,099	14,270	14,240	13,425	14,540	12,765	13,045
	Shell Canada	Corunna	25,835	27,398	28,326	26,485	25,130	25,540	25,736	24,339	24,335	22,829
	Shell Canada	Montréal	17,723	19,447	18,230	17,679	15,960	14,210	15,828	12,890	13,287	14,712
	Suncor	Sarnia	17,317	18,351	20,169	20,539	17,220	20,240	18,239	19,480	18,561	17,741
Ultramar Ltd	Lévis // St-Romuald	8,324	10,070	11,361	11,440	11,100	10,990	10,165	9,790	10,012	8,666	
Importer	Cervini Farms	Leamington	-	-	-	-	-	-	-	-	-	-
	Companie Miniere de Quebec Cartier	Port-Cartier	-	-	-	-	-	-	-	-	-	15,000
	Compaq Papiers	Stadacona	-	-	-	-	-	-	-	-	19,258	-
	Emera Fuels Incorporated	Dartmouth	-	-	-	-	-	-	-	-	27,200	-
	Great Lakes Greenhouses Inc	Leamington	-	-	-	-	-	-	-	-	-	15,060
	Kildair Services Ltd	Tracy	-	-	-	4,150	8,290	18,080	8,006	15,000	8,355	9,230
	Marine Petrobulk Ltd	North Vancouver	-	-	-	-	-	17,920	24,000	16,390	18,405	18,796
	Murphy Oil USA	Superior	-	-	-	45,710	18,230	-	-	-	-	-
	New Brunswick Power Corporation	Fredericton	-	-	-	27,360	27,820	27,800	27,269	25,194	25,540	24,550
	Newfoundland & Labrador Hydro	St. John's	-	-	-	19,960	19,940	20,970	20,600	20,186	20,603	20,941
	Nexfor Fraser Papers Incorporated	Edmundston	-	-	-	-	4,280	3,980	4,214	4,379	4,634	4,656
	Norske Canada	Campbell River	-	-	-	-	-	-	10,237	9,400	-	9,161
	Norske Canada	Crofton	-	-	-	-	-	-	9,871	-	-	9,835
	North 60 Petroleum Ltd	Whitehorse	-	-	-	6,530	3,440	2,430	4,313	4,288	4,249	3,830
	North Atlantic Refining Ltd	Come-by-Chance	-	-	-	-	-	-	-	25,491	20,230	19,394
	Nova Scotia Power	Halifax	-	-	-	27,030	25,990	26,810	28,102	19,728	17,868	20,120
	Pope and Talbot Ltd	Nanaimo	-	-	-	-	-	10,600	10,216	10,749	9,646	10,036
	Stadacona Inc.	Québec	-	-	-	-	-	-	-	-	-	19,300
	Statia Terminals Canada	Point Tupper	-	-	-	-	-	-	8,268	-	-	-
	Vancouver General Hospital	North Vancouver	-	-	-	-	-	10,600	10,600	-	-	-
	Western Pulp	Port Alice	-	-	-	-	-	14,510	14,840	13,478	13,821	12,873
	Western Pulp	Squamish	-	-	-	-	-	-	11,000	-	-	-
	National Average			16,761	17,300	17,250	17,220	17,710	17,400	17,280	15,366	15,428

**Table A3.5b: Volume-Weighted Annual Sulphur Level in Heavy Fuel Oil for 2004
(Reported by quarters)**

	Name	City	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
Refiner	Consumers' Co-operative Refineries	Regina	6,896	5,828	4,832	4,558	5,531
	Husky Oil Operations Ltd.	Prince George	23,464	22,543	24,227	24,899	23,878
	Imperial Oil	Dartmouth	13,180	16,756	15,760	13,497	14,836
	Imperial Oil	Nanticoke	15,340	17,820	18,440	17,030	17,208
	Imperial Oil	Sarnia	0	0	19,000	0	19,000
	Imperial Oil	Edmonton	13,380	14,270	14,370	14,050	14,014
	Irving Oil Ltd	Saint-John	12,600	13,200	13,800	14,900	13,471
	North Atlantic Refining Ltd	Come-by-Chance	19,600	17,900	18,200	21,500	21,500
	NOVA Chemicals Canada Ltd	Corunna	11,385	12,230	11,836	12,315	11,990
	Petro-Canada	Edmonton	20,570	19,590	8,340	11,000	15,821
	Petro-Canada	Montréal	13,500	12,500	12,600	11,300	12,458
	Petro-Canada	Oakville	13,100	12,400	13,600	13,100	13,045
	Shell Canada	Montréal	12,254	14,143	15,349	16,192	14,712
	Shell Canada	Corunna	23,812	22,885	21,769	23,447	22,829
	Suncor Energy Products Incorporated	Sarnia	18,200	13,630	20,070	21,230	17,741
	Ultramar Ltd	Lévis // St-Romuald	8,480	9,100	7,130	9,940	8,666
	Importer	Cervini Farms	Leamington	15,000	15,000	15,000	15,000
Companie Miniere de Quebec Cartier		Port-Cartier	0	9,980	17,650	17,800	15,944
Nexfor Fraser Papers Incorporated		Edmundston	4,100	4,470	4,660	4,800	4,656
Great Lakes Greenhouses Inc		Leamington	15,300	14,500	15,300	15,000	15,060
Kildair Services Ltd		Tracy	0	9,000	6,700	12,900	9,230
Marine Petrobulk Ltd		North Vancouver	20,000	18,500	18,500	18,500	18,796
New Brunswick Power Corporation		Fredericton	28,000	20,600	0	25,000	24,550
Newfoundland & Labrador Hydro		St. John's	21,720	17,250	18,800	21,660	20,941
Norske Canada		Campbell River	0	10,100	8,090	10,100	9,161
Norske Canada		Crofton	9,300	10,200	9,780	10,200	9,835
North 60 Petroleum Ltd		Whitehorse	0	3,789	3,840	0	3,830
North Atlantic Refining Ltd		Come-by-Chance	19,600	17,900	18,200	21,500	19,394
Nova Scotia Power		Halifax	20,500	19,900	19,600	20,400	20,120
Pope and Talbot Ltd		Nanaimo	9,000	10,500	10,200	10,100	10,036
Stadacona Inc.		Québec	0	0	19,300	0	19,300
Western Pulp		Port Alice	0	14,200	11,300	14,900	12,873
National Average			14,702	14,569	13,684	15,236	14,612

* Only the annual average was reported.

Table A3.6a: Volume-Weighted Annual Sulphur Level in Aviation Gasoline 2000 - 2004

			Sulphur Levels (mg/kg)				
	Name	City	2000	2001	2002	2003	2004
Refiner	Imperial Oil	Edmonton	-	-	10	10	10
	Petro-Canada	Edmonton	-	352	229	231	400
	Shell Canada Products	Montréal-Est	-	14	50	10	1
Importer	Imperial Oil	Burnaby	-	30	-	-	-
	Imperial Oil	Edmonton	-	10	-	-	-
National Average			-	51	59	29	59

Note: Sulphur levels in aviation gasoline were averaged with motor gasoline levels for the years 1995 to 2000. See Table A3.1a.

Table A3.6b: Volume-Weighted Annual Sulphur Level in Aviation Gasoline for 2004**(Reported by quarters)**

			Sulphur Levels (mg/kg)				
	Name	City	Q1	Q2	Q3	Q4	Annual
Refiner	Imperial Oil	Edmonton	10	11	9	10	10
	Petro-Canada	Edmonton	400	400	400	400	400
	Shell Canada Products	Montréal-Est	1	1	1	1	1
National Average			85	45	46	101	59

Appendix 4

Canadian General Standards Board Standards for Sulphur Content in Fuels

**Appendix 4: Canadian General Standards Board
Standards for Sulphur Content in Fuels**

<u>Specification Number</u>	<u>Fuel Category</u>	<u>Maximum Sulphur Content</u> <u>(% mass)</u>
CAN/CGSB-3.5-99 CAN/CGSB-3.25-94	Gasoline Unleaded, Automotive Aviation	0.10 0.05
CAN/CGSB-3.23-2002 CAN/CGSB-3.22-2002	Aviation Turbo Fuel Kerosene Type (Jet A, A-1, F-34) Wide Cut Type (Jet b, F-40)	0.30 0.40
CAN/CGSB-3.3-99	Kerosene Type No. 1-K Type No. 2-K	0.04 0.30
CAN/CGSB 3.6-2000 CAN/CGSB-3.517-2000	Diesel Fuel Regular Sulphur - Type A Regular Sulphur - Type B Automotive Low Sulphur	0.30 0.50 0.05
CAN/CGSB-3.16-99	Mining Diesel Fuel Special Special - Low Sulphur	0.25 0.05
CAN/CGSB-3.2-99	Fuel Oil Type 0 Type 1 Type 2 Type 4 Type 5 Type 6	0.30 0.50 0.50 no limit no limit no limit
3-GP-11d (2002)	Fuel, Naval Distillate Type 11 Type 15	0.5 0.5
CAN/CGSB-3.27-M89	Naphtha Fuel Type 1 Type 2	5 mg/kg 500 mg/kg
3-GP-24d (2002)	Aviation Fuel High Flash Type	0.40
CAN/CGSB-3.18-2000	Diesel Fuel for Locomotive Type Medium Speed Diesel Engines	0.50

Appendix 5

Maximum Sulphur Content in Fuels Federal and Provincial Regulations and Municipal By-Laws

Maximum Sulphur Content in Fuels Federal and Provincial Regulations and Municipal By-Laws

Province	Act / Regulation / By-Law	Regulation Adoption	Maximum Sulphur Content (% mass)
Canada	<i>Canadian Environmental Protection Act 1999</i> Diesel Fuel Regulation (end 2002)	1999 (revoked 2002)	<u>Diesel</u> 0.05 (on-road)
	Sulphur in Diesel Fuel Regs (start 2003)	2002	<u>Diesel</u> 0.05 (on-road) 0.0015 (2006 – on-road)
	Sulphur in Gasoline Regulation	1999	<u>Gasoline</u> 0.015 avg/0.03cap (2002-04) ¹ 0.003 avg/0.008cap (2005) ¹
New Brunswick	<i>Clean Air Act</i> Air Quality Regulation	1983 (amended 1990 and 1998)	<u>Fuel Oil</u> Type No.1 - 0.5 Type No. 2 - 0.5 Type No. 4 - 1.5 Type No. 5 - 2.0 Type No. 6b - 3.0 Type No. 6c - 3.0
Newfoundland and Labrador	<i>Environmental Protection Act</i> Air Pollution Control Regulations	May 20, 2004	<u>Fuel Oil</u> Any fuel oil grade Type Nos. 4, 5 or 6: <ul style="list-style-type: none"> • Where Best Available Technology (BAT) is employed: <ul style="list-style-type: none"> - 3%, or - 2% on an annual basis. • Where BAT is not employed: <ul style="list-style-type: none"> - 2.2%, or - 2% on an annual basis.
Quebec	<i>Petroleum Products and Equipment Act</i> Petroleum Products Regulation	1991 (amended 1996, 1998 & 1999)	<u>Gasoline:</u> Grades 1, 2, 3, 4= 0.15% <u>Diesel (Regular):</u> <ul style="list-style-type: none"> - Type AA= 0.2% - Types A, B, C, D, E= 0.5% <u>Diesel (Low-sulphur content):</u> <ul style="list-style-type: none"> - Type AA, A, B, C, D, E= 0.05% <u>Fuel Oil:</u> <ul style="list-style-type: none"> - Type No. 00= 0.2% - Types Nos. 0,1,2= 0.5%
	<i>Environment Quality Act</i> Regulation Respecting the Quality of the Atmosphere	1981	<u>Fuel Oil</u> Light Oil (LFO)= 0.5% Intermediate Oil= 1.0% Heavy Oil (HFO)= 2.0%
	By-Law 90, Montreal Urban Community	1987	<u>Fuel Oil</u> LFO Type No. 2= 0.4% HFO Type No.6= 1.25 to 1.4%

¹ Have various options. See regulation for details.

Maximum Sulphur Content in Fuels Provincial Regulations and By-Laws

(Cont'd)

Province	Act / Regulation / By-Law	Regulation Adoption	Maximum Sulphur Content (% mass)
Ontario	<i>Environmental Protection Act</i> Regulation 361, Sulphur Content of Fuels (Effective in Metro Toronto only)	1970 (amended 1980, 1990 and 1999)	<u>Fuel Oil</u> Type No. 1 - 0.5 Type No. 2 - 0.5 Type No. 4 - 1.5 Type No. 5 - 1.5 Type No. 6b - 1.5 Type No. 6c - 1.5
	<i>Environmental Protection Act</i> Regulation 338, Boilers Regulation	1986 (amended 1999)	<u>Fuel Oil</u> All fuel oils - 1.0
British Columbia	<i>Waste Management Act</i> Sulphur Content of Fuel Regulation	1989	1.1
	<i>Waste Management Act</i> Cleaner Gasoline Regulation	1995 -Effective 1999 in Southwest B.C. -Effective 2000 for the rest of B.C.	<u>Gasoline</u> 0.015 ² 0.020 ²
Nova Scotia	<i>Environment Act</i> Air Quality Regulations.	March 2005	<u>Fuel Oil</u> HFO= 2.0% by mass

² Annual limit also can use the U.S. Complex Model to provide equivalent emission levels.

Appendix 6

Comparison of Average Sulphur Content from the 2003 Liquid Fuels Report with the Limits Set Forth by the Canadian General Standards Board and the Provincial Regulations

Appendix 6

Comparison of 2004 Reported Liquid Fuel Average Sulphur Levels and Standards Set Forth by the Canadian General Standards Board (CGSB) and the Provincial Regulations

1) Average Reported Sulphur Content (%) Versus the Standards Set Forth by the CGSB

Type of Fuel	Reported Average Sulphur Content (%)			CGSB (% mass)
	Low Value	National Average	High Value	
Aviation Turbo Fuel	0.043	0.059	0.238	0.30 - Jet A 0.40 - Jet B
Motor Gasoline	0.004	0.006	0.030	0.10 - Unleaded
Aviation Gasoline	0.010	0.006	0.040	0.05
Kerosene/Stove Oil	0.017	0.051	0.460	0.04 - Type No. 1 -K 0.30 - Type No. 2 -K
Low Sulphur Diesel Fuel	0.023	0.030	0.046	0.05 - Automotive
Diesel Fuel	0.089	0.218	0.478	0.30 - Type A 0.50 - Type B
Light Fuel Oil	0.0270	0.167	0.383	0.30 - Type No. 0 0.50 - Type No. 1 0.50 - Type No. 2
Heavy Fuel Oil	1.082	1.461	2.800	No Limits

2) Average reported sulphur content (%) for Heavy Fuel Oil versus the limits set forth by Provincial regulations

Region	Sulphur Content (%) in Heavy Fuel Oil (2004)	Provincial Regulations	
		Province	Sulphur Content Limit (%)
Atlantic	1.697	New Brunswick	<u>Heavy Fuel Oil</u> 1.5 - Type No. 4 2.0 - Type No. 5 3.0 - Type No. 6
		Newfoundland and Labrador	<u>Heavy Fuel Oil</u> Any fuel grade Type Nos. 4, 5 or 6: <ul style="list-style-type: none"> • Where Best Available Technology (BAT) is employed: <ul style="list-style-type: none"> - 3%, or - 2% on an annual basis. • Where BAT is not employed: <ul style="list-style-type: none"> - 2.2%, or - 2% on an annual basis.
		Nova Scotia (Proposed)	2.0 – All types
Quebec	1.082	Quebec	2.0 - All types 1.25 to 1.4 – HFO Type No.6 (Montreal)
Ontario	1.669	Ontario	1.0 - Boilers 1.5 - All Types (Toronto)
West	1.505	B.C.	1.1 - All Types

Appendix 7

Summary of the Election Information as per *Sulphur in Gasoline Regulations*

Appendix 7: Summary of the Election Information as per *Sulphur in Gasoline Regulations*

Election Information under Section 11(1) of the *Sulphur in Gasoline Regulations*

Company	Locations	Region	Type	Registration No.	No Election (flat limits)	1 Year Avgs.	2½ Year Avg.	Avg. Type Used [Note 1]	Estimate of Volume weighted average concentration of Sulphur (cumulative)			Estimates of Volume weighted average concentration of Sulphur (straight)		
									End of 2002	End of 2003	End of 2004	End of 2002	End of 2003	End of 2004
Chevron	British Columbia	West	R	CHV-R1-BC-98			Y	Straight	180	135	110	216	170	100
Husky	Prince George, BC	West	R	HUS-R1-BC-98			Y	Cumulative	250	167	140	194	175	75
Petro-Can	Edmonton, AB	West	R	PCL-R4-AB-98			Y	Cumulative	220	168	150	220	175	90
Imperial	Strathcona, AB	West	R	IOL-R4-ON-98			Y	Cumulative	270	206	145	270	206	30
Shell	Scotford, AB	West	R	SHL-R3-AB-98			Y	Straight	50	50	50	50	50	50
Co-op	Regina, SK	West	R	CCR-R1-SK-98			Y	Cumulative	200	125	100	200	87.5	63
Imperial	Sarnia, ON	Ontario	R	IOL-R2-ON-98			Y	Cumulative	230	175	150	230	182	78
Shell	Sarnia, ON	Ontario	R	SHL-R2-ON-98			Y	Straight	530	177	50	530	80	30
Sunoco	Sarnia, ON	Ontario	R	SUN-R1-ON-98			Y	Cumulative	250	162	140	250	194.5	31
Imperial	Nanticoke, ON	Ontario	R	IOL-R3-ON-98			Y	Cumulative	295	228	150	295	221.5	6
Petro-Can	Oakville, ON	Ontario	R	PCL-R2-ON-98			Y	Cumulative	220	150	150	220	130	135
Petro-Can	Montreal, QC	Quebec	R	PCL-R1-QU-98			Y	Cumulative	230	230	140	230	230	30
Shell	Montreal, QC	Quebec	R	SHL-R1-QU-98			Y	Straight	350	230	150	350	170	30
Ultramar	Quebec, QC	Quebec	R	ULM-R1-QC-98			Y	Cumulative	200	108	145	200	170	93
Irving	St.John, NB	Atlantic	R	IRV-R1-NB-98		Y		Assumed [2]	48	48	48	48	48	48
Imperial	Dartmouth, NS	Atlantic	R	IOL-R1-NS-98			Y	Cumulative	270	200	150	270	127	30
North Atlantic	Come-by-Chance, NF	Atlantic	R	NAR-R1-NF-98	Y			Assumed [2]	49	49	49	49	49	49
Sunoco	Montreal, QC	Quebec	B	SUN-B6-QU-02			Y	Cumulative	300	222	145	300	183	30
Ultramar	Montreal, QC	Quebec	B	ULM-B1-QU-98			Y	Cumulative	200	115	140	200	95	110
Ultramar	Dartmouth, NF	Atlantic	B	ULM-B2-NF-98			Y	Cumulative	200	163	140	200	177	110
Petro-Can	British Columbia	West	I	PCL-I3-BC-98			Y	Cumulative	150	46	150	150	46	30
Petro-Can	Ontario	Ontario	I	PCL-I2-ON-98			Y	Cumulative	Note 3	Note 3	150	Note 3	Note 3	150
Neste	Ontario	Ontario	I	NES-I2-ON-98			Y	Straight	300	200	140	300	150	50

Appendix 7: Summary of the Election Information as per *Sulphur in Gasoline Regulations*

Election Information under Section 11(1) of the *Sulphur in Gasoline Regulations*

Company	Locations	Region	Type	Registration No.	No Election (flat limits)	1 Year Avgs.	2½ Year Avg.	Avg. Type Used [Note 1]	Estimate of Volume weighted average concentration of Sulphur (cumulative)			Estimate of Volume weighted average Concentration of Sulphur (annual)		
									End of 2002	End of 2003	End of 2004	End of 2002	End of 2003	End of 2004
Olco	Ontario	Ontario	I	OLC-I1-QU-98			Y	Straight	300	200	140	300	150	50
Olco	Ontario	Ontario	I	OLC-I2-ON-98			Y	Straight	300	0	0	300	0	0
Sunoco	Ontario	Ontario	I	SUN-I1-ON-98			Y	Cumulative	300	222	145	300	183	30
Petro-Can	Quebec	Quebec	I	PCL-I1-QU-98			Y	Cumulative	Note 3	Note 3	150	Note 3	Note 1	150
Neste	Quebec	Quebec	I	NES-I1-QU-98			Y	Straight	300	0	0	300	0	0
Sunoco	Quebec	Quebec	I	SUN-I2-QU-00			Y	Cumulative	300	222	145	300	183	30

Regional Averages (Note 4)

Year	Ontario	West	Quebec	Atlantic	Canada
1999	460	224	280	230	320
2000	450	220	270	270	310
2001	390	220	270	230	290
2002	335	201	224	178	249
2003	156	139	109	140	136
2004	52	60	82	44	63
2005	25	25	25	25	25

Notes

1. Companies either provided an average value for gasoline produced in each of the years 2002, 2003, and 2004 OR provided a running average for 2002, 2002-2003, and 2002-2004. The numbers in italics were computed by Environment Canada based on the assumption of annual volumes remaining constant between 2002-2004.

2. Sulphur levels for Irving and North Atlantic are based on 2001 levels.

3. The regulatees stated that while on a 30 month volume-weighted election has been made, it is their intention to combine all import batches with their refinery, in that province of import. Therefore unless their location of import changes, there will be no reported imports in those provinces. If such a change occurs the estimated number for the period in question is 0.0150 wt%.

4. Historical 1999-2004 data is from the Sulphur in Liquid Fuels reports. Regional volume-weighted averages for 2002-2004 assume 2001 refinery volumes remain constant.

