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# Sulphur in Liquid Fuels

## 2001

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July 2002



# **Environment Canada**

## **Sulphur in Liquid Fuels**

**2001**

### **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.

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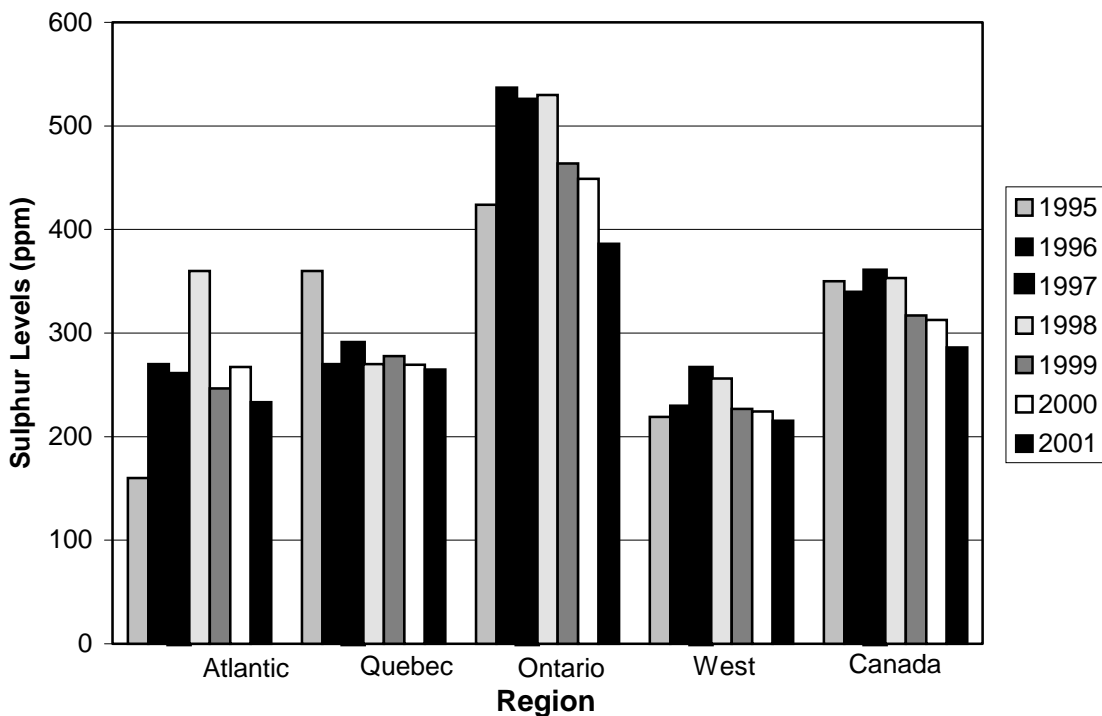
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## 1.0 Summary

This report summarizes data concerning the sulphur content in liquid fuels for the year 2001, provided to Environment Canada pursuant to the *Fuels Information Regulations, No.1* of the *Canadian Environmental Protection Act*.

Analysis of the data submitted by producers and importers of liquid fuels shows wide variation in the sulphur content between the different types of liquid fuels as well as between the regions. The average sulphur content in gasoline nationally was determined to be 287 ppm (0.029% wt). Graph 1.1 shows the reported levels of sulphur in gasoline by region for the years 1995-2001. The level of sulphur in gasoline has shown a decline in 2001 from previous years.

**Graph 1.1 : Sulphur Levels in Motor/Aviation Gasoline by Region, 1995-2001**



In contrast to the decline in the level of sulphur in gasoline seen for 2001, the reported mass of sulphur in all liquid fuels has increased by 15% from 2000 values, as shown in Graph 1.2. This increase is mainly due to a 74% increase in the volume of heavy fuel oil imported into Canada. The volumes of heavy fuel oil imported have increased by 59% in the Atlantic provinces, 16% in Quebec, and 25% in the Western provinces.

**Graph 1.2 : Sulphur Mass in Liquid Fuels by Region, 1995-2001**

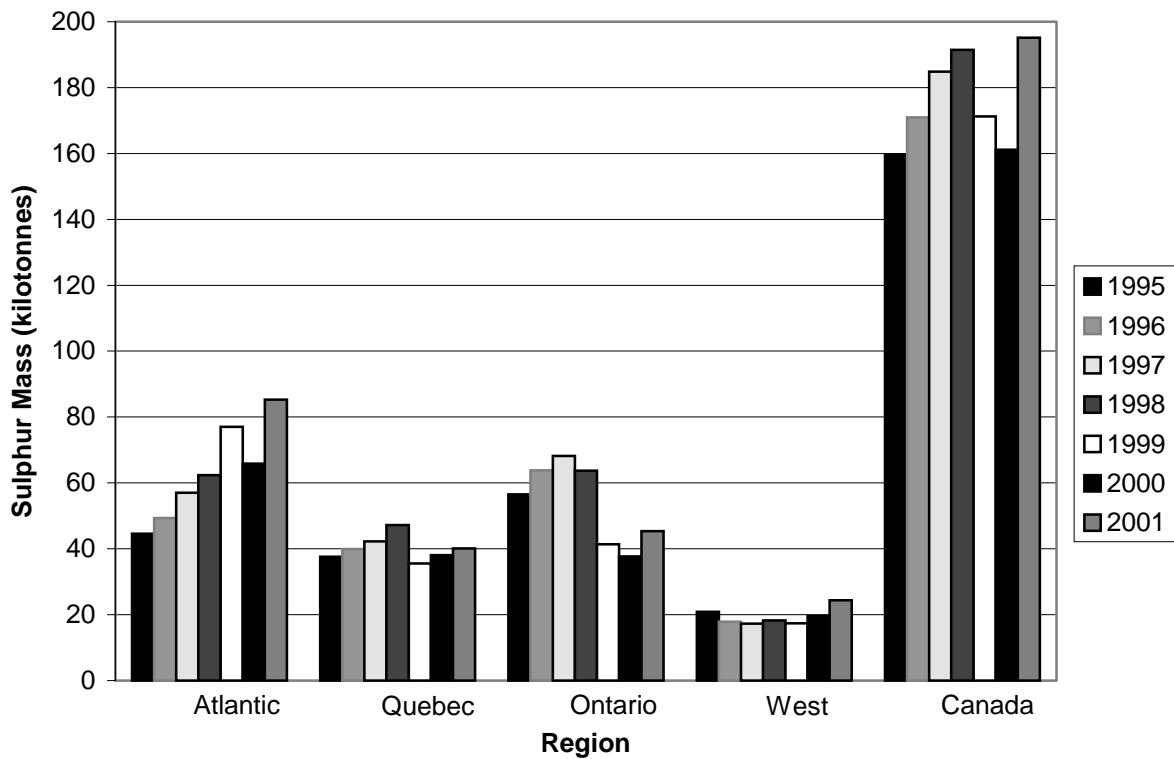




Table 1.1 is a national summary of data compiled from Form 1, "Report on Sulphur Content", of the Fuels Information Regulations, No. 1, which petroleum refineries and importing companies are required to submit to Environment Canada.

The largest reported volume of liquid fuel produced in, or imported into Canada was gasoline which constituted 46.1 % of all products, and accounted for 4.4 % of the sulphur mass in liquid fuels. Heavy fuel oil constituted only 9.9 % by volume of the total liquid fuels, but contained 71.9% of the total sulphur mass in Canada. The Atlantic provinces, Quebec and Ontario accounted for 86.8% of the total mass of sulphur present in fuels. Almost half of the total sulphur mass (40.5 %) was attributed to the Atlantic provinces.

Type of Fuel	Fuel Production / Imports		Sulphur Mass (tonnes)	Average Sulphur Content (%wt.)	Distribution of Sulphur in Products (%)
	(m <sup>3</sup> )	(% of total)			
<b>Aviation Turbo Fuel</b>	6,071,733	7.2	2,580	0.053	1.4
<b>Motor Gasoline</b>	38,911,587	46.1	8,168	0.029	4.4
<b>Aviation Gasoline</b>	125,198	0.1	5	0.005	0.0
<b>Kerosene/Stove Oil</b>	1,320,978	1.6	458	0.042	0.2
<b>Low-Sulphur Diesel Fuel</b>	20,625,948	24.4	5,890	0.034	3.2
<b>Diesel Fuel</b>	3,500,151	4.1	7,412	0.249	4.0
<b>Light Fuel Oil</b>	4,306,518	5.1	7,435	0.201	4.0
<b>Heavy Fuel Oil</b>	8,376,166	9.9	132,785	1.728	71.9
<b>Plant Consumption</b>	1,237,273	1.5	19,918	1.608	10.8
<b>TOTAL</b>	84,475,551	100.0	184,651	0.241	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 1) were adopted in 1977 to provide Environment Canada with information regarding liquid fuel composition, particularly concerning sulphur dioxide (SO<sub>2</sub>) 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 fuels<sup>1</sup> 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 (m<sup>3</sup>) 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 definition of each type 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 m<sup>3</sup> of a fuel to report all the additives other than lead or lead compounds in fuels.

A new category was added to the reporting form in 1995 to account for the production of low sulphur diesel fuel. This addition was a follow-up to the non-regulatory program agreed upon by the petroleum marketing industry 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. This program commenced on October 1, 1994. Information on low sulphur diesel is included in this report. Effective January 1, 1998, low sulphur diesel has been mandated for on-road vehicles by the federal Diesel Fuel Regulations (see section 2.2).

### ***2.2 Regulations Controlling Sulphur Levels in Fuels***

The current Canadian federal Diesel Fuel Regulations which came into effect January 1, 1998 require all on-road diesel fuel to have a sulphur level not exceeding 0.05% (500 ppm) by weight. In the Notice of Intent on Cleaner Vehicles, Engines and Fuels, published in the Canada Gazette in February 2001, the Government of Canada committed to align Canadian requirements for sulphur content in on-road diesel fuel with those in the United States' Final Rule on Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, published January 18, 2001. The U.S. requirements are a sulphur limit of 15 ppm starting mid-2006. On December 22, 2001, Environment Canada published proposed Sulphur in Diesel Fuel Regulations in Part I of the Canada Gazette. The regulations propose to limit the sulphur concentration in on-road vehicles to 15 mg/kg (15 ppm) beginning June 1, 2006, in alignment with U.S.

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<sup>1</sup> Throughout this document, the word "fuel(s)" applies only to those fuels which are in liquid form and petroleum-based.

standards. The final regulation is expected to be published in Part II of the Canada Gazette in the summer of 2002.

On June 23, 1999, the Sulphur in Gasoline Regulations were passed. These regulations limit the sulphur content in gasoline to an average of 30 ppm with a maximum of 80 ppm starting January 1, 2005. An interim period beginning July 1, 2002, limits the average sulphur content of gasoline to 150 ppm over a 2½ year period. The first administrative requirements consisting of election notices to meet pool averages and the submission of compliance plan information demonstrating how companies will comply with the regulations were due May 2, 2002.

The Notice of Intent on Cleaner Vehicles, Engines and Fuels also proposes the development of measures to reduce the level of sulphur in both light and heavy fuel oils, with the view to matching the requirements set by the European Union. The European Union requirements are 1% wt. for heavy fuel oil and 0.1% wt. for light fuel oil, and will be fully implemented by 2008. Current work with the National Round Table on the Economy and the Environment (NRTEE) involves studying the environmental and economic implications of using fiscal instruments to reduce sulphur levels in light and heavy fuel oil. Environment Canada also plans to release a discussion paper in 2002 regarding the options for new Canadian fuel oils requirements.

The Canadian General Standards Board (CGSB) has commercial standards for fuels, some of which have been adopted by provinces in regulations. Depending on the type of fuel, these standards establish a range of 0.04 % to 1.00% (400 ppm to 1 000 ppm) of sulphur by weight (see Appendix 4). CGSB standards are revised periodically to reflect developments in product, usage and manufacturing technology.

### ***2.3 Period Covered***

This report covers the period from January 1 to December 31, 2001. Petroleum refineries and importing companies are required to submit information for each calendar quarter to the regional office of Environment Canada before January 31 of the following year. Failure to submit the data on time, incomplete data or unsigned forms are offenses under the Canadian Environmental Protection Act and may be punishable by fines and imprisonment.

### ***2.4 Company Specific Sulphur Levels***

Appendix 3 presents data on the annual volume-weighted sulphur content (in parts per million by weight) for gasoline, diesel and fuel oil during the period of 1995 to 2001 for each Canadian refinery and importer. This information was released to the public through a number of requests under the Access to Information (ATI) Act that took place during 1997 to 2001. Data for importers and blenders prior to 1998 were not part of the ATI requests.

## ***2.5 Reporting Petroleum Refineries and Importing Companies***

The following petroleum refineries, blenders, and upgrading plants reported, under the Regulations, information pertaining to production volume and fuel sulphur content for 2001:

Chevron Canada Limited (Burnaby Refinery, Burnaby, BC)  
Consumers' Co-operative Refineries Limited (Regina, SK)  
Husky Oil Operations Limited (Prince George Refinery, Prince George, BC)  
Imperial Oil Limited (Dartmouth Refinery, Dartmouth, NS)  
Imperial Oil Limited (Sarnia Refinery, Sarnia, ON)  
Imperial Oil Limited (Nanticoke Refinery, Nanticoke, ON)  
Imperial Oil Limited (Strathcona Refinery, Edmonton, AB)  
Irving Oil Limited (Irving Oil Refinery, Saint John, NB)  
North Atlantic Refining Limited (North Atlantic Refinery, Come-By-Chance, NF)  
NOVA Chemicals Canada Limited (Corunna Plant, Sarnia, ON)  
Parkland Refining Limited (Bowden Refinery, Bowden, AB)  
Petro-Canada Lubricants (Lubricants Centre, Mississauga, ON)  
Petro-Canada Products Limited (Montréal Refinery, Montréal, QC)  
Petro-Canada Products Limited (Edmonton Refinery, Edmonton, AB)  
Petro-Canada Products Limited (Lake Ontario Refinery, Oakville, ON)  
Robbins Feed and Fuel Limited (Thorold, ON) (Blender)  
Shell Canada Limited (Montréal-East Refinery, Montréal-Est, QC)  
Shell Canada Products Limited (Sarnia Manufacturing Centre, Corunna, ON)  
Shell Canada Products Limited (Scotford Refinery, Fort Saskatchewan, AB)  
Suncor Energy Inc. (Oil Sands, Fort McMurray, AB)  
Sunoco Inc. (Sarnia Refinery, Sarnia, ON)  
Syncrude Canada Inc. (Mildred Lake Facility, Fort McMurray, AB)  
Ultramar Canada Inc. (St-Romuald Refinery, St-Romuald, QC)

The following petroleum importers reported, under the Regulations, information pertaining to import volume and fuel sulphur content for 2001:

BP Cherry Point (Blaine, Washington, USA)  
Canadian Pacific Railway (Calgary, AB)  
Daigle Oil Limited (Edmundston, NB)  
Ford Motor Company of Canada (Essex, St. Thomas & Windsor, ON)  
Imperial Oil Limited (Burrard Terminal, Burnaby, BC)  
Fraser Papers Inc. (Edmundston, NB)  
Kildair Services Limited (Tracy, QC)  
Mackenzie Petroleum Limited (Dawson City, YT)  
Marine Petrobulk Limited (North Vancouver, BC)  
Neste Petroleum (Terminal Canterm Montréal, Montréal-Est, QC)  
Neste Petroleum (Terminal Canterm Québec, Beauport, QC)  
New Brunswick Power Corporation (Fredericton, NB)  
Newfoundland and Labrador Hydro (St. John's, NF)  
Noco Energy Canada (Nobleton, ON)  
Norske Canada (Crofton Division, Crofton, BC)  
Norske Canada (Elf Falls Division, Campbell River, BC)

Northern Transportation Company Limited (Iqaluit, NU)  
North 60 Petro Limited (Whitehorse, YT)  
Nova Scotia Power Inc. (Halifax, NS)  
Olco Petroleum Group Inc. (Hamilton, ON)  
PaceSetter Enterprises (Whitehorse, YT)  
Parkland Refining Limited (Bowden Refinery, Bowden, AB)  
Petro-Canada Products (Burrard Products Terminal, Port Moody, BC)  
Petro-Canada Products Limited (Montréal Refinery, Montréal, QC)  
Petro-Canada Products Limited (Lake Ontario Refinery, Oakville, ON)  
Pétroles Norcan Inc. (Montréal, QC)  
Pope and Talbot Limited (Harmac Pulp Operations, Nanaimo, BC)  
Robbins Feed and Fuel Limited (Thorold, ON) (Blender)  
Statia Terminals Canada (Point Tupper, NS)  
Sunoco Inc. (Sarnia Refinery, Sarnia, ON)  
Ultramar Canada Inc. (St-Romuald Refinery, St-Romuald, QC)  
United Refining Company (Warren, Pennsylvania, USA)  
Vancouver General Hospital (North Vancouver, BC)  
Western Pulp Inc. (Port Alice, BC)  
Western Pulp Inc. (Squamish, BC)

### **3.0 Volumes of Liquid Fuels Produced / Imported**

In order to verify the accuracy of the sulphur content in the fuel reports submitted to Environment Canada, the reported volumes of produced fuels were compared to Statistics Canada figures for 2001 (see Table 3.1). The “plant consumption” volumes of oil sand processing plants are included in the Environment Canada numbers but are not included in the Statistics Canada numbers. There appears to be reasonable agreement between the two sets of data, given the differences in approaches noted below.

Type of Fuel	Statistics Canada (m <sup>3</sup> )	Environment Canada (m <sup>3</sup> )
Aviation Turbo Fuel	5,850,683	6,071,733
Motor Gasoline	38,840,282	38,911,587
Aviation Gasoline	104,765	125,198
Kerosene/Stove oil	392,960	1,320,978
Low-Sulphur Diesel Fuel	-	20,625,948
Diesel Fuel	22,780,304	3,500,151
Light Fuel Oil	5,159,918	4,306,518
Heavy Fuel Oil	8,626,420	8,376,166
Plant Consumption	761,679	1,237,273
<b>TOTAL</b>	<b>82,517,011</b>	<b>84,475,551</b>

Notes:

**1** Statistics Canada data were compiled for the period December 2000 - November 2001, Source: Statistics Canada, Catalogue 45-004 Monthly, November 2001.

**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** Plant consumption fuel is almost all heavy fuel oil, but in some instances may consist of light fuel oil and diesel.

**5** Volumes reported to Environment Canada mostly reflect production at the various refineries while Statistics Canada considers opening and closing inventories and inter-product transfers.

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

### ***4.1 National and Regional Summaries***

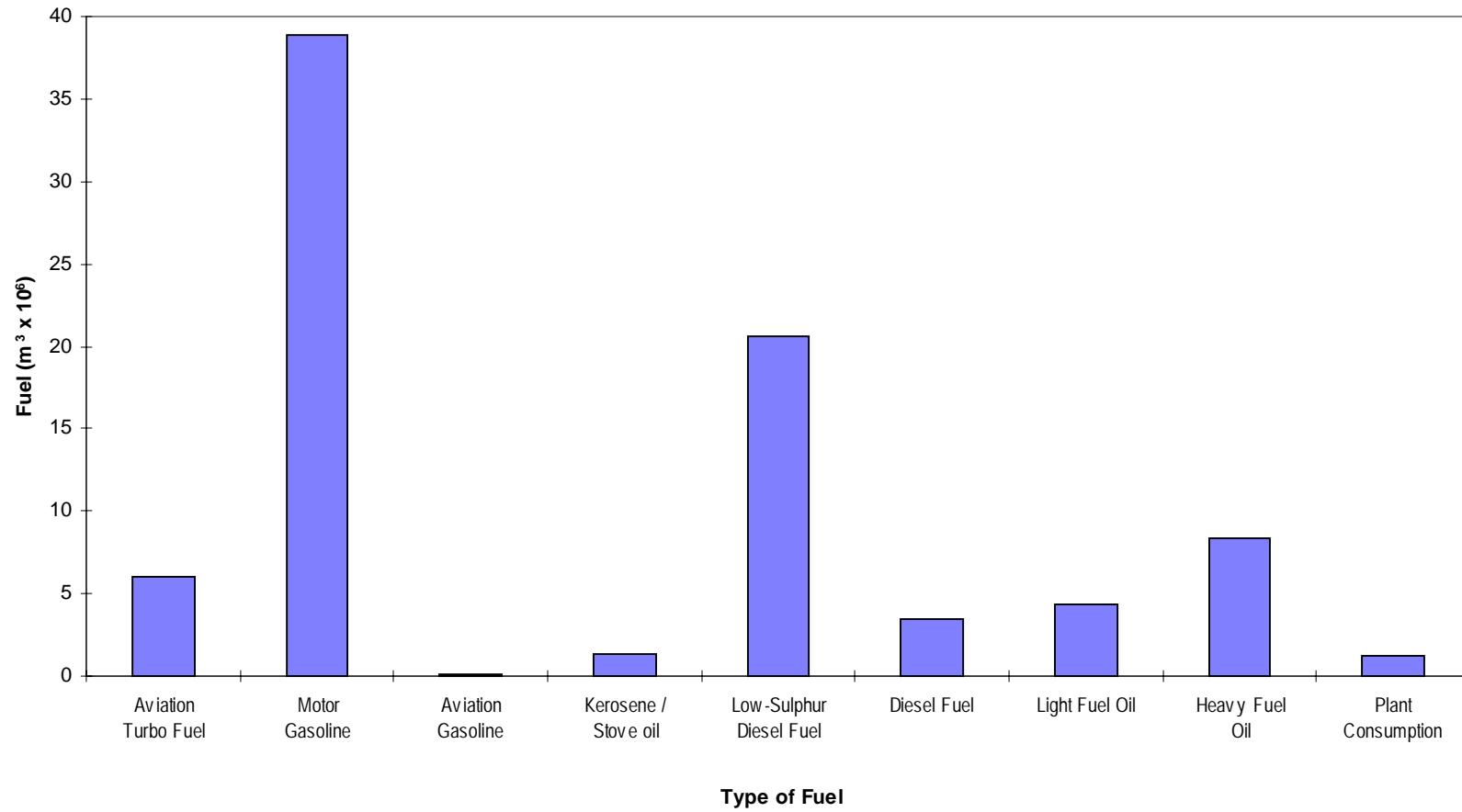
The following graphs and tables summarize the data compiled from reports submitted pursuant to the regulations for 2001:

- 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: Graph 4.7
- Historical Trends (National): Graphs 4.8 to 4.13

<b>TABLE 4.1 :</b>					
<b>Fuel Production / Imports and Sulphur Content</b>					
<b>National Summary for 2001</b>					
<b>Type of Fuel</b>	<b>Fuel Production / Imports</b>		<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (%wt.)</b>	<b>Distribution of Sulphur in Products (%)</b>
	<b>(m<sup>3</sup>)</b>	<b>(% of total)</b>			
<b>Aviation Turbo Fuel</b>	6,071,733	7.2	2,580	0.053	1.4
<b>Motor Gasoline</b>	38,911,587	46.1	8,168	0.029	4.4
<b>Aviation Gasoline</b>	125,198	0.1	5	0.005	0.0
<b>Kerosene/Stove Oil</b>	1,320,978	1.6	458	0.042	0.2
<b>Low-Sulphur Diesel Fuel</b>	20,625,948	24.4	5,890	0.034	3.2
<b>Diesel Fuel</b>	3,500,151	4.1	7,412	0.249	4.0
<b>Light Fuel Oil</b>	4,306,518	5.1	7,435	0.201	4.0
<b>Heavy Fuel Oil</b>	8,376,166	9.9	132,785	1.728	71.9
<b>Plant Consumption</b>	1,237,273	1.5	19,918	1.608	10.8
<b>TOTAL</b>	84,475,551	100.0	184,651	0.241	100.0

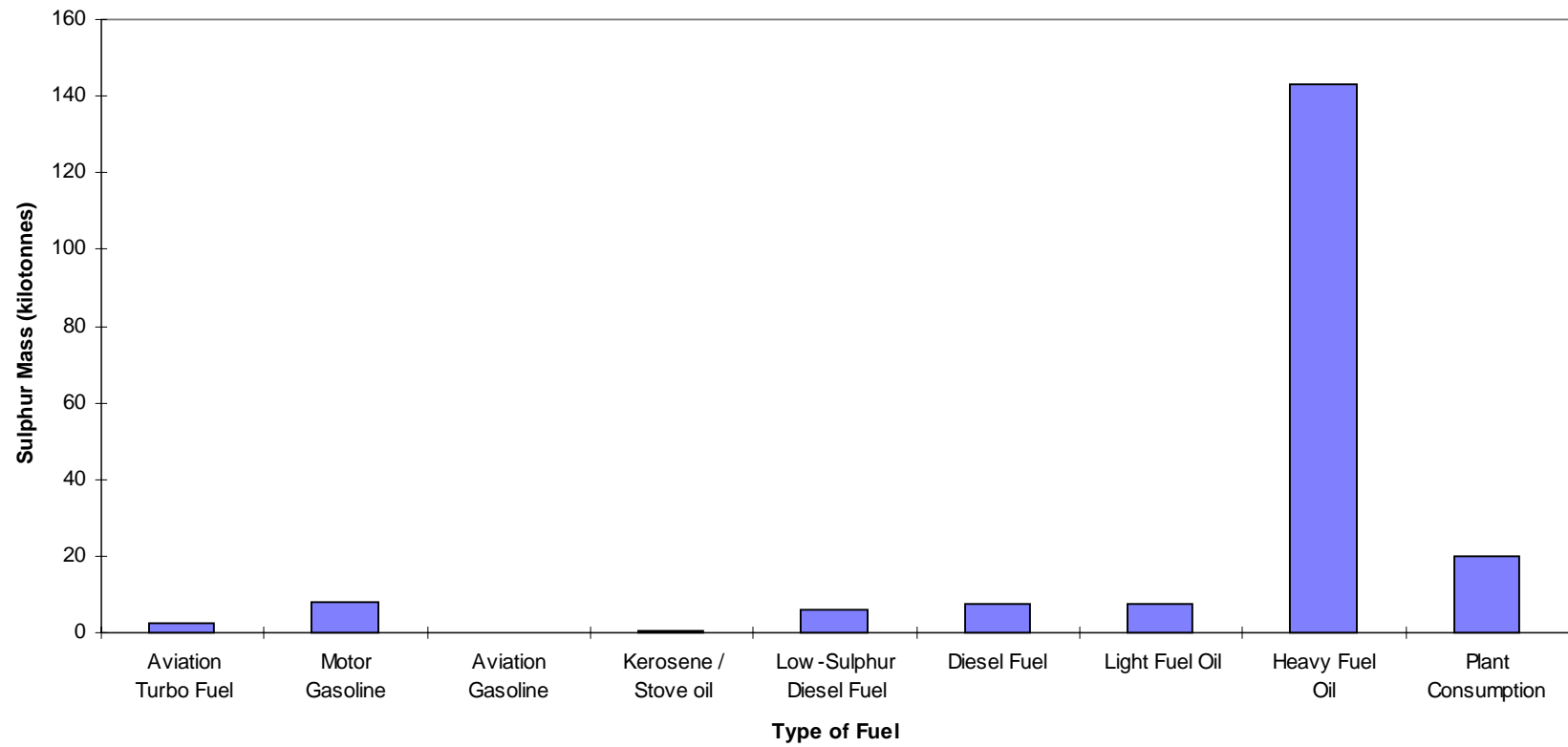
Note: Totals may not add up to due to rounding.

**Graph 4.1 National Liquid Fuel Production / Imports in 2001**





**Graph 4.2 : Tonnage of Sulphur in Liquid Fuels in 2001**



**TABLE 4.2A : Fuel Production/Imports and Sulphur Content for 2001**

<b>Atlantic Region</b>				
<b>Type of Fuel</b>	<b>Fuel Production/Imports (m<sup>3</sup>)</b>	<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (%wt.)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	544,573	669	0.155	0.9
Motor Gasoline	2,835,477	485	0.023	0.6
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	117,572	32	0.033	0.0
Low-Sulphur Diesel Fuel	1,859,831	658	0.042	0.9
Diesel Fuel	N/A <sup>1</sup>	269	0.076	0.4
Light Fuel Oil	1,352,747	1,612	0.139	2.2
Heavy Fuel Oil	3,299,149	61,792	2.222	82.6
Plant Consumption	479,615	9,316	1.986	12.4
<b>TOTAL</b>	<b>10,488,965<sup>2</sup></b>	<b>74,833</b>	<b>0.801</b>	<b>100.0</b>

Notes:

1. Volume not included to protect confidential data.
2. Total volume excludes the volume not included, as per note 1.

**TABLE 4.2B : Fuel Production/Imports and Sulphur Content for 2001**

<b>Quebec Region</b>				
<b>Type of Fuel</b>	<b>Fuel Production/Imports (m<sup>3</sup>)</b>	<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (%wt.)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	1,017,390	320	0.039	0.8
Motor Gasoline	10,175,678	1,984	0.027	4.9
Aviation Gasoline	N/A <sup>1</sup>	0	0.001	0.0
Kerosene/Stove oil	1,118,126	402	0.043	1.0
Low-Sulphur Diesel Fuel	4,679,186	1,652	0.042	4.1
Diesel Fuel	N/A <sup>1</sup>	580	0.262	1.4
Light Fuel Oil	1,736,639	3,555	0.240	8.9
Heavy Fuel Oil	2,384,404	28,505	1.203	71.1
Plant Consumption	178,599	3,094	1.704	7.7
<b>TOTAL</b>	<b>21,593,789<sup>2</sup></b>	<b>40,092</b>	<b>0.195</b>	<b>100.0</b>

Notes:

1. Volumes not included to protect confidential data.
2. Total volume includes the volumes not included, as per note 1.

**TABLE 4.2C : Fuel Production/Imports and Sulphur Content for 2001**

<b>Ontario Region</b>				
<b>Type of Fuel</b>	<b>Fuel Production/Imports (m<sup>3</sup>)</b>	<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (%wt.)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	1,836,846	734	0.049	1.6
Motor Gasoline	12,937,962	3,661	0.039	8.1
Aviation Gasoline	0	0	0.000	0.0
Kerosene/Stove oil	N/A <sup>1</sup>	17	0.033	0.0
Low-Sulphur Diesel Fuel	4,341,922	1,305	0.036	2.9
Diesel Fuel	1,120,558	2,729	0.289	6.0
Light Fuel Oil	1,205,719	2,262	0.217	5.0
Heavy Fuel Oil	1,674,069	27,177	1.645	59.9
Plant Consumption	311,277	7,461	2.338	16.5
<b>TOTAL</b>	<b>23,428,353 <sup>2</sup></b>	<b>45,348</b>	<b>0.205</b>	<b>100.0</b>

Notes:

1. Volume not included to protect confidential data.
2. Total volume excludes the volume not included, as per note 1.

**TABLE 4.2D : Fuel Production/Imports and Sulphur Content for 2001**

<b>West Region</b>				
<b>Type of Fuel</b>	<b>Fuel Production/Imports (m<sup>3</sup>)</b>	<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (%wt.)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	2,672,924	858	0.039	3.5
Motor Gasoline	12,962,471	2,038	0.022	8.4
Aviation Gasoline	N/A <sup>1</sup>	4	0.007	0.0
Kerosene/Stove oil	21,614	6	0.037	0.0
Low-Sulphur Diesel Fuel	9,745,009	2,275	0.027	9.3
Diesel Fuel	1,698,187	3,834	0.262	15.7
Light Fuel Oil	N/A <sup>1</sup>	7	0.067	0.0
Heavy Fuel Oil	1,018,543	15,310	1.490	62.8
Plant Consumption <sup>3</sup>	267,782	47	0.020 <sup>1</sup>	0.2
<b>TOTAL</b>	<b>28,480,984 <sup>2</sup></b>	<b>24,379</b>	<b>0.092</b>	<b>100.0</b>

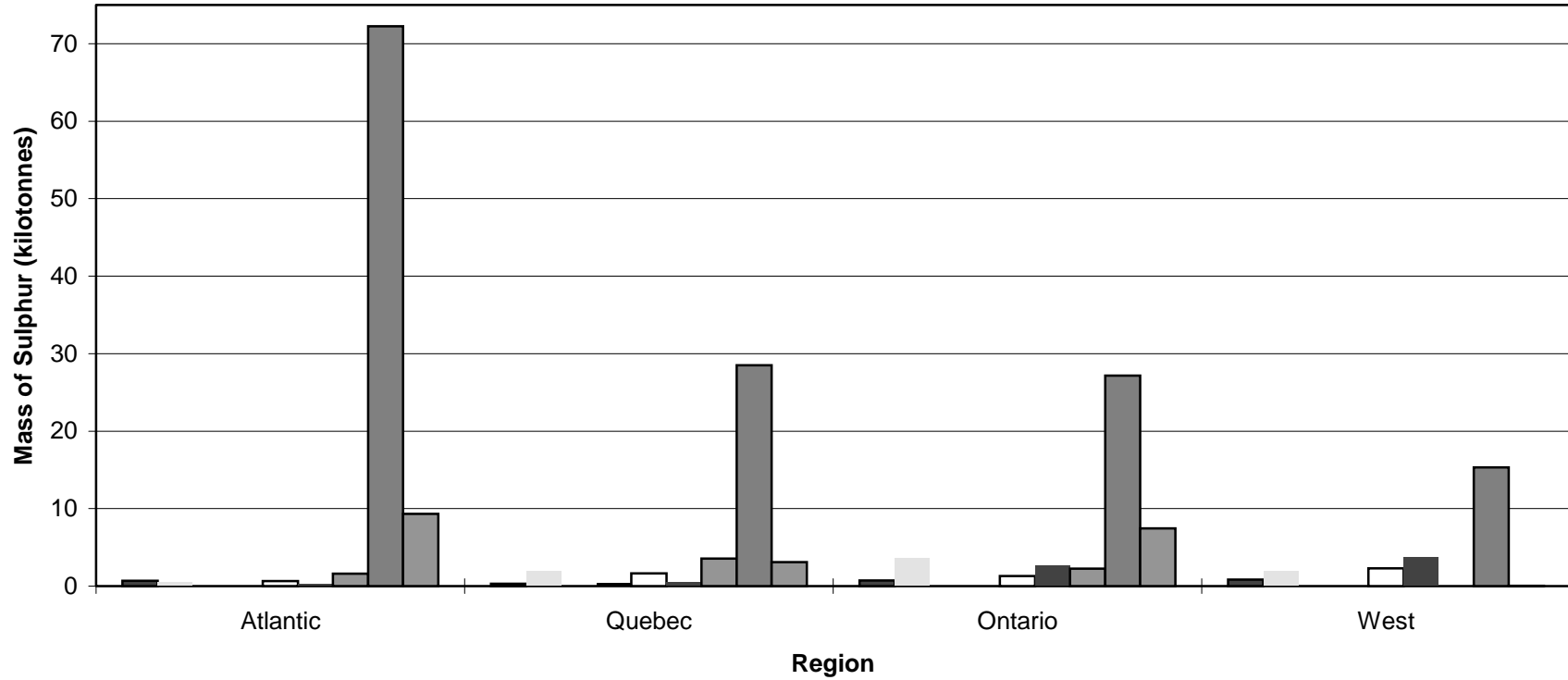
Notes:

1. Volumes not included to protect confidential data.
2. Total volume includes the volumes not included, as per note 1.
3. Plant consumption in the West consists mostly of diesel and light fuel oil.

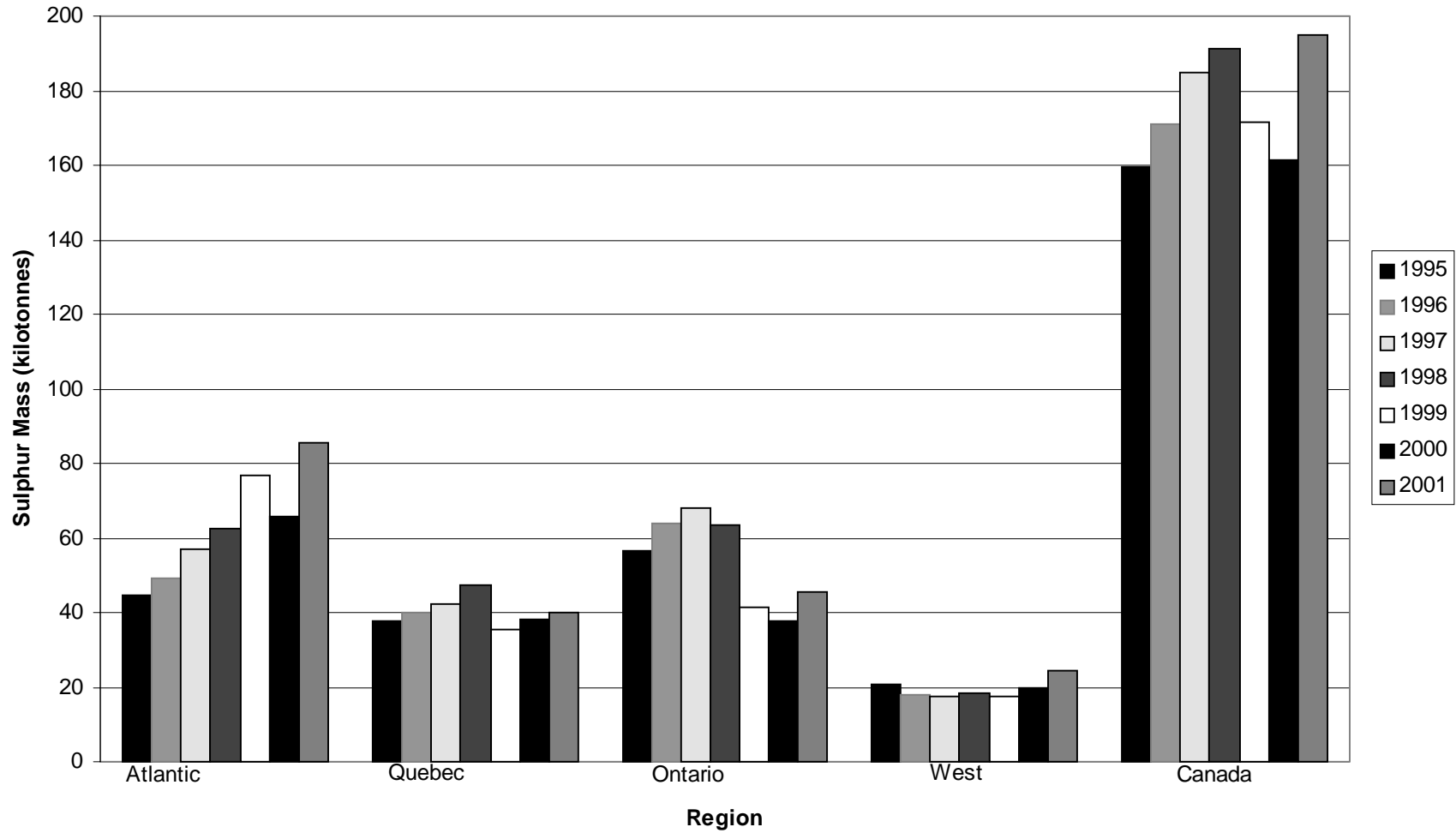
**TABLE 4.2E : Regional and National Volume Weighted Averages of the Density of Fuels Produced/Imported in 2001 (in kg/m<sup>3</sup>)**

	<b>Atlantic</b>	<b>Quebec</b>	<b>Ontario</b>	<b>West</b>	<b>Canada</b>
<b>Aviation Turbo Fuel</b>	794.5	810.6	812.8	812.0	810.4
<b>Motor Gasoline</b>	735.3	732.4	734.4	725.8	731.1
<b>Aviation Gasoline</b>	-	706.7	-	811.0	775.9
<b>Kerosene/Stove Oil</b>	825.5	827.5	823.7	814.8	826.9
<b>Low-Sulphur Diesel Fuel</b>	841.4	838.5	847.2	849.8	845.9
<b>Diesel Fuel</b>	840.9	845.6	841.3	859.2	850.2
<b>Light Fuel Oil</b>	854.6	856.6	861.9	854.8	857.4
<b>Heavy Fuel Oil</b>	985.3	989.7	984.9	1011.5	989.7
<b>Plant Consumption</b>	977.2	1015.5	1015.1	837.7	962.1

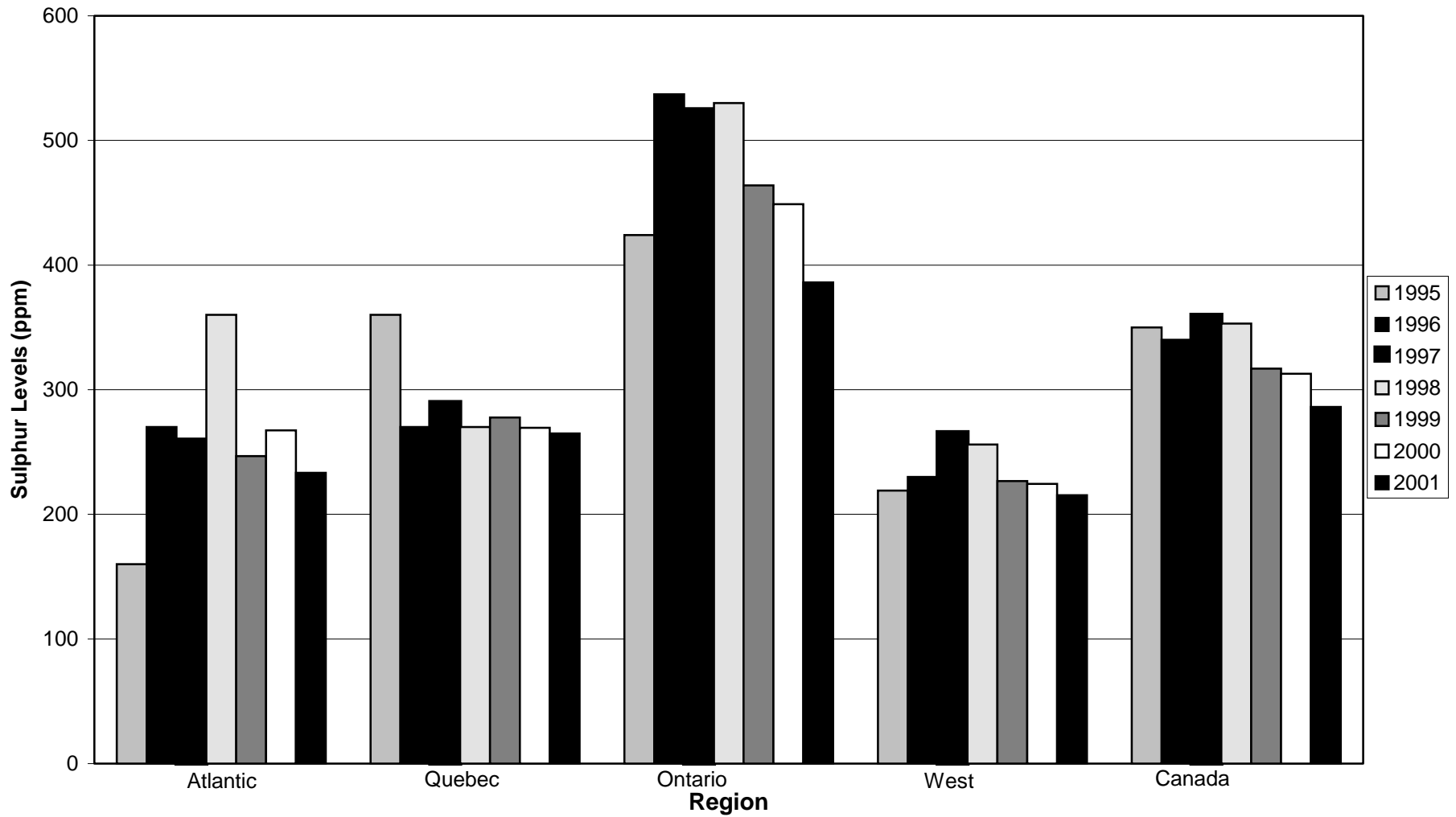
**Graph 4.3 : Mass of Sulphur in Liquid Fuels Produced or Imported in 2001**



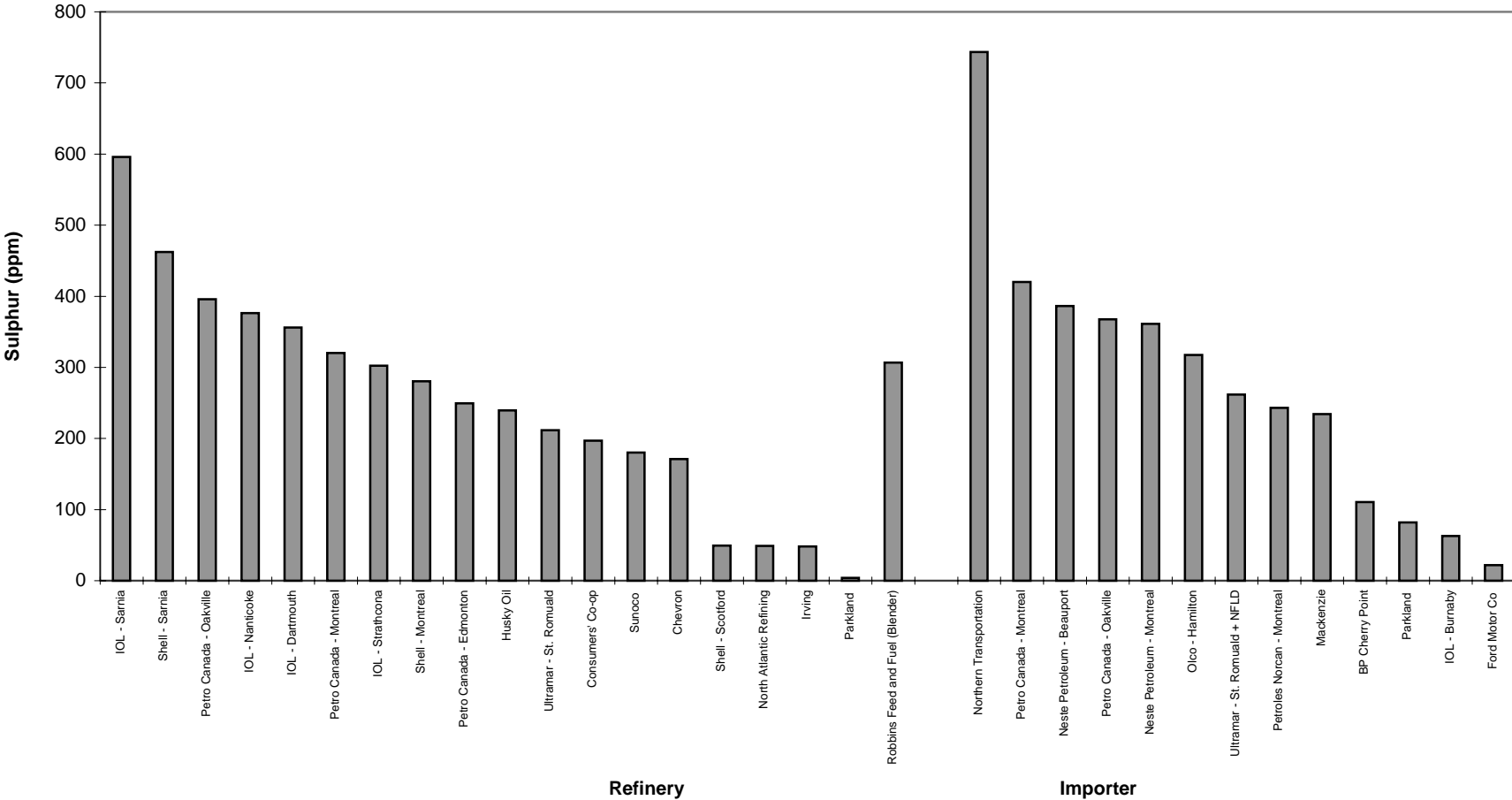
**Graph 4.4 : Sulphur Mass in Liquid Fuels by Region, 1995-2001**



**Graph 4.5 : Sulphur Levels in Motor/Aviation Gasoline by Region, 1995-2001**

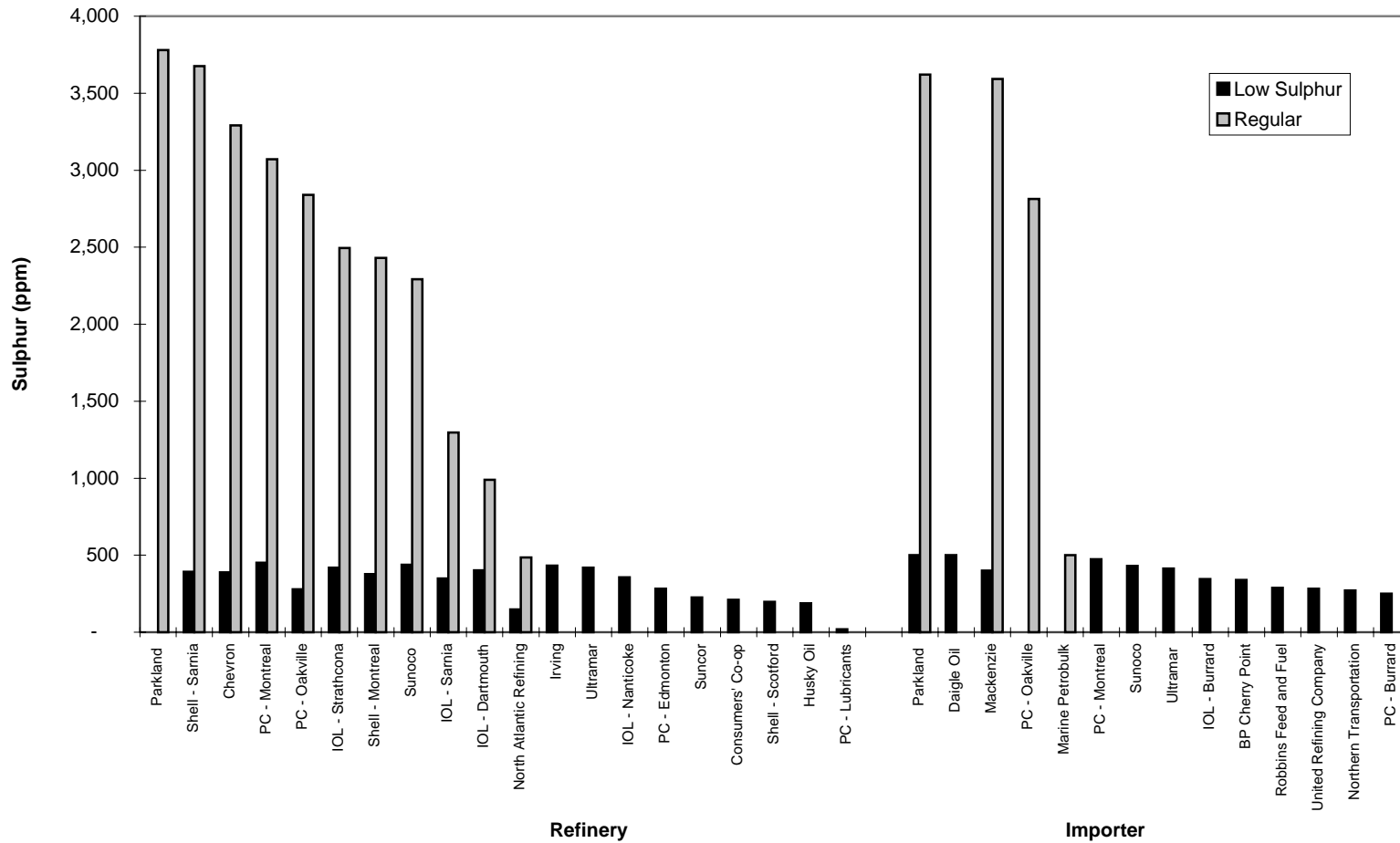


Graph 4.6: Sulphur Levels in Motor Gasoline by Refinery / Importer in 2001

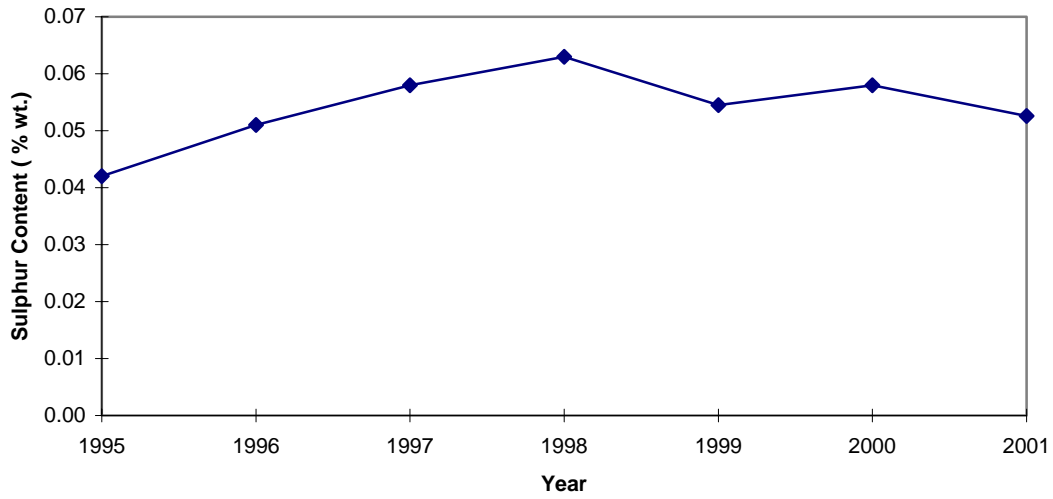




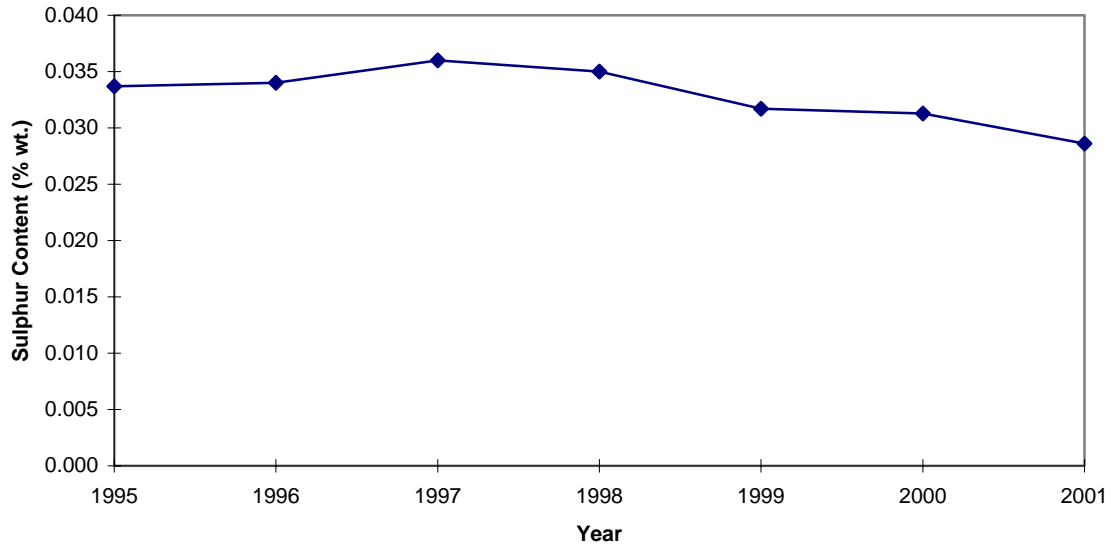
Graph 4.7: Sulphur Levels in Diesel Fuel by Refinery / Importer in 2001



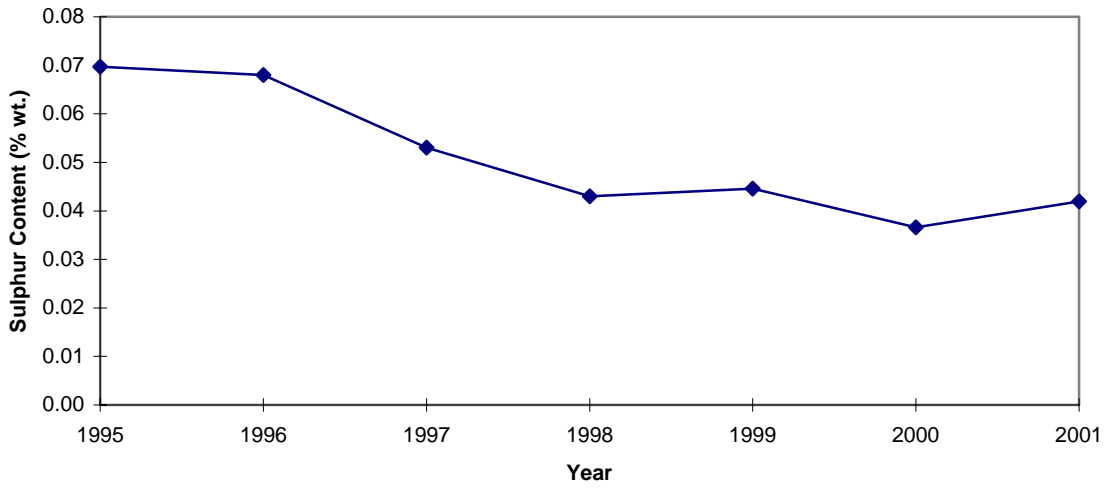
**Graph 4.8 : 2001 National Trend of Sulphur Content in Aviation Turbo Fuel**



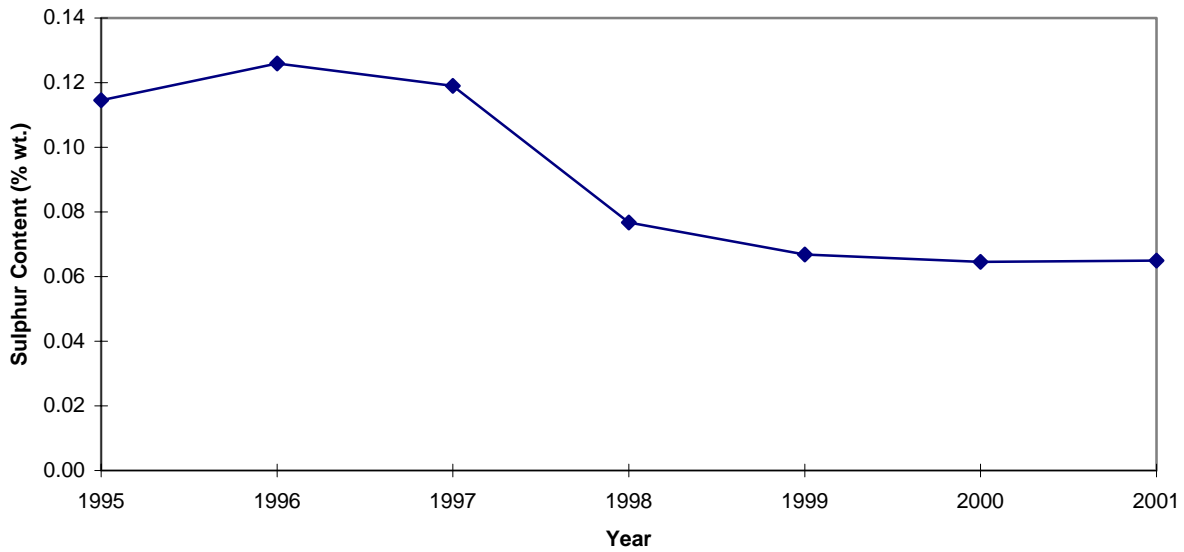
**Graph 4.9: 2001 National Trend of Sulphur Content in Motor/Aviation Gasoline**



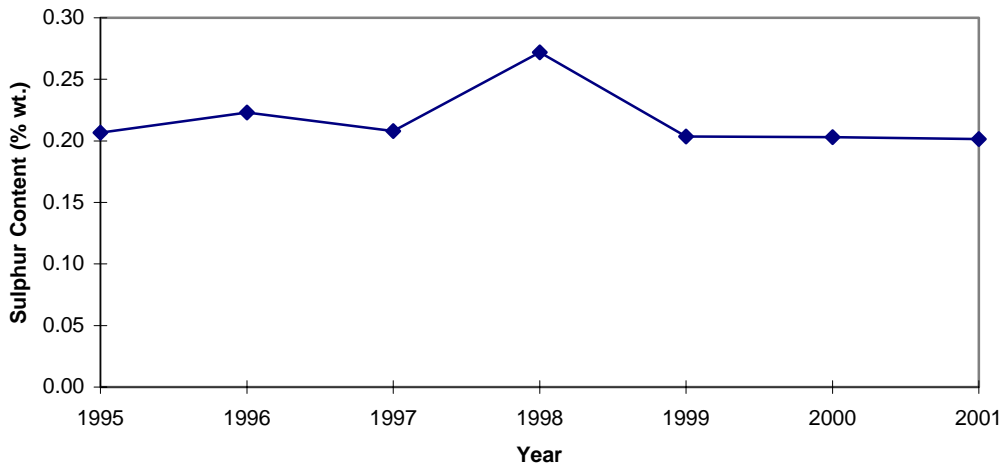
**Graph 4.10 : 2001 National Trend of Sulphur Content in Kerosene/Stove Oil**



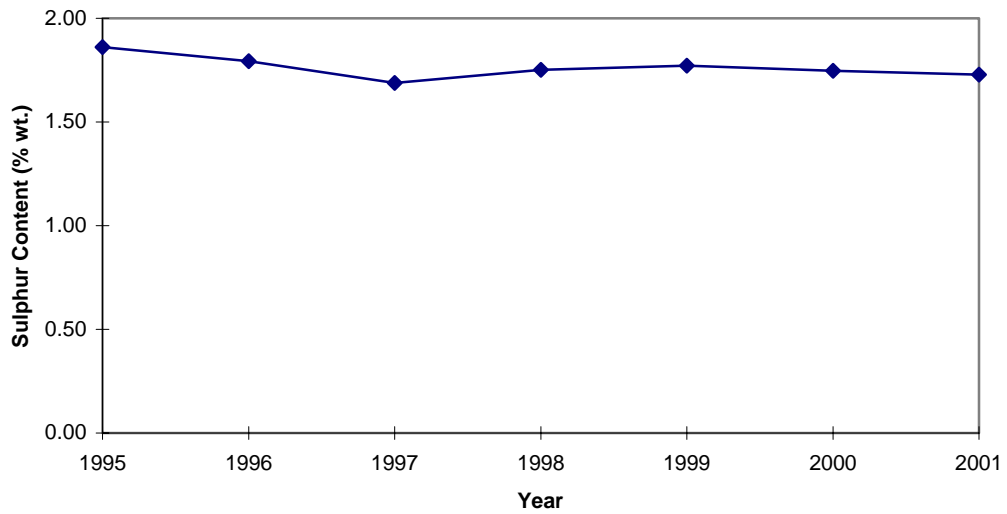
**Graph 4.11 : 2001 National Trend of Sulphur Content in Diesel Fuel (Total Pool)**



**Graph 4.12 : 2001 National Trend of Sulphur Content in Light Fuel Oil**



**Graph 4.13 : 2001 National Trend of Sulphur Content in Heavy Fuel Oil**



## **Appendix 1**

### ***Fuels Information Regulation, No. 1***



**Fuels Information Regulations, No. 1**

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1. **Short Title.** These Regulations may be cited as the *Fuels Information Regulations, No. 1*.
2. **Interpretation.** In these Regulations, “**Minister**” means the Minister of the Environment.
3. **Application.** These Regulations apply to fuels in liquid form that originate from crude oils, coal or bituminous sands.

**Information.** (1) Every person who produces in Canada or imports into Canada more than 400 cubic meters of a fuel named in an item of Form 1 of the schedule shall submit to the Minister, for each quarter of the calendar year during which the fuel was produced or imported, the information required by that Form.

(2) Information submitted pursuant to subsection (1) shall be submitted on or before January 31 following the end of the calendar year during which the fuel was produced or imported.

5. (1) Every person who produces in Canada or imports into Canada a fuel that contains any additive other than lead or lead compounds shall submit to the Minister, in respect of each additive not previously reported to the Minister under these Regulations, the information required by Form 2 of the schedule within sixty days of selling a cumulative total of 400 cubic meters of the fuel containing that additive within a calendar year.

(2) Where any change occurs in the information submitted by a person required by section 1, 2 or 4 of Form 2 of the schedule, that person shall, within sixty days of the change, report the change to the Minister.

**SCHEDULE**

**Form 1 - Report on Sulphur Content**

Reporting Period \_\_\_\_\_  
Company Name \_\_\_\_\_  
Facility Name \_\_\_\_\_ Telephone \_\_\_\_\_  
Facility Address \_\_\_\_\_

**Fuels Produced or Imported for use or Sale in Canada**

Name of Fuel	Quantity Refined, Produced or Imported (cubic meters)	API Gravity	Sulphur Content (Weight %)		
			Highest	Lowest	Weighted Average
1. Aviation Turbo Fuel					
2. Motor Gasoline					
a) lead free					
b) regular					
c) premium					
3. Kerosene and Stove Oil					
4. Diesel Oil (by type)					
5. No. 2 Light Fuel Oil					
6. Heavy Fuel Oil					
a) No. 4					
b) No. 5					
c) No. 6					
7. Synthetic Crude (sold as fuel)					
8. A fuel other than the fuels named in items 1 to 5					

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (Date signed)

(Signature of Authorized Company Official)

(Title)

(Date signed)

**Form 2 - Liquid Fuel Additive Report**

(To be submitted once for each fuel additive)

Fuel Manufacturer/Importer \_\_\_\_\_  
Telephone \_\_\_\_\_  
Address \_\_\_\_\_  
Additive Manufacturer \_\_\_\_\_  
Telephone \_\_\_\_\_  
Address \_\_\_\_\_



1. Type of Fuel \_\_\_\_\_  
Brand Name of Additive \_\_\_\_\_  
Purpose of Additive \_\_\_\_\_  
Quantity Used Annually \_\_\_\_\_

2. Fuel Additive Concentration (mg/L)

Highest	Lowest	Weighted Average
_____	_____	_____

3. Composition of Fuel Additive

Complete either paragraph (a) or (b) or attach a copy of a letter from the fuel additive manufacturer attesting to the fact that the information required by paragraph (a) or (b) has been forwarded to Environment Canada.

(a) Chemical name of each \_\_\_\_\_ Approx. % by weight Constituent

(b) Element \_\_\_\_\_ Approx. % by weight

Carbon

Hydrogen

Oxygen

(list other elements that individually account for more than 0.1% of the additive weight)



## **Appendix 2**

### **Sample of Form 1, “Report on Sulphur Content in Liquid Fuels”**





### REPORT ON SULPHUR CONTENT OF LIQUID FUELS

QUARTER: \_\_\_\_\_ YEAR: \_\_\_\_\_

This report should be submitted:

- a) by January 31<sup>st</sup> for each quarter separately of the preceding calendar year, **unless** per notice below.
- b) by every person who during the calendar year has produced or imported over 400 cubic meters of petroleum fuels for use in Canada. (No minimum for diesel fuel)
- c) for the purpose of informing the Minister of Environment Canada.
- d) to:

**Notice:** 30 days after the last day of each quarter if this form includes information scheduled under section 4(1) of the Diesel Fuel Regulations.

**This form is provided for your convenience. Please refer to the Canadian Environmental Protection Act, Fuels Information Regulation No.1, Diesel Fuel Regulations for information on compliance with the requirements for reporting on sulphur content of liquid fuels.**

#### FUELS PRODUCED OR IMPORTED FOR USE OR SALE IN CANADA

Company								
Facility Name:								
Facility Address:								
Type of Liquid Fuel	Volume (m³)				Density (Kg/m³) or API Gravity		Sulphur Content (weight %)	
	Produced	Imported			Min.	Max.	Volume Weighted Avg.	
1 Aviation Turbo Fuel	1.1 Jet A							
	1.2 Jet B							
2 Gasoline	2.1 Regular							
	2.2 Mid-Grade							
	2.3 Premium							
	2.4 Aviation							
3 Kerosene and Stove Oil								
4 Diesel Fuel		Produced	Sold	Imported	Sold			
	4.1 S < 0.05 wt%							
	4.2 S > 0.05 wt%							
5 Light Fuel Oil								
6 Heavy Fuel Oil	6.1 Number 4							
	6.2 Number 5							
	6.3 Number 6							
7 Other: specify (including Plant Consumption and Synthetic Crude used as a fuel)								
Authorized Company Official: (Please Print)	Title:			Signature:				
Telephone Number:	Fax Number:			Date:				

Revised : March 2000

#### REPORT ON SULPHUR CONTENT OF LIQUID FUELS

#### INSTRUCTIONS

1. Please use this form only and do not create or substitute another. If additional space is required for fuel information, make extra copies of the form.

2. For the column headings: “Volume (m<sup>3</sup>) - Produced, Imported”, enter the number for the gross production of the liquid fuel. Do not include inter-product transfers of the liquid fuel.

### LIQUID FUEL DEFINITIONS

#### Aviation Turbo Fuel

All kerosene-type (Jet A) and naphtha/wide-cut type (Jet B) fuels for turbo-jet or straight-jet type aircraft engines.

#### Gasoline

All gasoline-type fuels for internal combustion engines including aviation gasoline.

#### Kerosene and Stove Oil

Kerosene, mineral lamp oil, stove oil, type 1 fuel oil including all fuels intended for atomizing burners.

#### Diesel Fuel

All grades of distillate fuel suitable for diesel engines.

#### No. 2 Light Fuel Oil

Distillate fuel intended for use in most atomizing-type burner applications.

#### Heavy Fuel Oil

Fuel oils are heating fuel oil - type 4,5,and 6 containing residual components and include bunker C.

#### Other:

-plant consumption: liquid fuels used onsite or in company operations and not accounted for in items 1 to 6. Data should be provided for each fuel type using the definitions listed above.

-synthetic crude used as a fuel

-does not include gases

## **Appendix 3**

### **Volume Weighted Annual Sulphur Levels by Refiner for 1995 to 2001**





**Table A3.1: Volume-Weighted Annual Sulphur Level in Motor Gasoline**

	Name	City	Sulphur Levels (parts per million by weight)						
			1995	1996	1997	1998	1999	2000	2001
Refiners	Chevron	Burnaby	215	273	294	246	199	174	171
	Consumer's Co-op	Regina	97	179	103	148	187	242	197
	Husky Oil	Prince George	183	261	225	282	170	248	239
	Imperial Oil	Dartmouth	365	419	374	491	329	382	356
	Imperial Oil	Sarnia	728	787	712	792	694	693	596
	Imperial Oil	Nanticoke	340	506	530	529	450	456	376
	Imperial Oil	Strathcona	239	243	346	297	272	252	302
	Irving Oil Limited	Saint-John	71	35	43	129	96	85	48
	North Atlantic Refining Ltd.	Come-by-Chance	38	75	118	76	55	47	49
	Parkland	Bowden	0	1	1	4	4	8	4
	Petro-Canada	Montreal	472	356	387	316	367	292	320
	Petro-Canada	Oakville	528	489	519	514	523	479	396
	Petro-Canada	Edmonton	360	380	394	377	311	311	250
	Shell	Montreal	392	319	333	312	269	318	280
	Shell	Sarnia	553	579	582	567	453	466	462
	Shell	Scotford	50	50	50	50	50	50	49
	Sunoco	Sarnia	368	276	298	301	209	192	180
Ultramar	St-Romuald	219	174	186	171	173	218	212	
Robbins Feed & Fuel (Blender)	Thorold	#	#	#	137	271	239	307	
Importers	BP Cherry Point	Blaine	#	#	#	70	103	105	110
	Delta Western Fuel (Totem Oil)	Whitehorse	#	#	#	610	73	236	-
	Ford Motor Company	Ontario	#	#	#	-	-	28	22
	Husky Oil	Prince George	#	#	#	80	-	-	-
	Imperial Oil	Burnaby	#	#	#	210	-	-	63
	Imperial Oil	Montreal	#	#	#	-	340	-	-
	Mackenzie Petroleum	Dawson City	#	#	#	170	301	280	234
	Murphy Oil USA	Superior	#	#	#	540	430	-	-
	Neste Petroleum	Beauport							386
	Neste Petroleum	Montreal							361
	Northern Transportation	Iqaluit	#	#	#	100	310	107	743
	Olco Petroleum Group	Quebec	#	#	#	457	511	299	-
	Olco Petroleum Group	Hamilton	#	#	#	410	540	394	317
	PaceSetter Enterprises	Whitehorse	#	#	#	-	246	220	-
	Parkland	Bowden	#	#	#	110	18	18	82
	Petro-Canada	Montreal	#	#	#	340	360	-	420
	Petro-Canada	Oakville	#	#	#	610	520	490	368
	Petro-Canada	Port Moody	#	#	#	210	321	-	-
	Petroles Norcan	Montreal	#	#	#	470	560	273	243
	Robbins Feed & Fuel	Thorold	#	#	#	140	270	-	-
TransCanada Energy	Calgary	#	#	#	100	500	-	-	
Ultramar	St-Romuald	#	#	#	120	300	270	262	
	National Average		345	340	360	350	320	310	290

# Sulphur level has not been requested or released under the *Access to Information Act*.

Note: For the years 1995 to 2000, sulphur levels for motor gasoline were averaged with levels for aviation gasoline. For 2001, the values are for sulphur in motor gasoline only.

**Table A3.2: Volume-Weighted Annual Sulphur Level in Low-Sulphur Diesel**

	Name	City	Sulphur Levels (parts per million by weight)						
			1995	1996	1997	1998	1999	2000	2001
Refiners	Chevron	Burnaby	350	390	380	400	400	400	389
	Consumer's Co-op	Regina	200	270	250	230	220	190	211
	Husky Oil	Prince George	140	200	200	210	190	190	188
	Imperial Oil	Dartmouth	340	360	390	400	330	370	402
	Imperial Oil	Sarnia	-	-	420	290	410	350	349
	Imperial Oil	Nanticoke	-	-	160	290	280	310	356
	Imperial Oil	Strathcona	290	400	410	380	430	400	420
	Irving Oil Limited	Saint-John	400	400	440	450	440	430	433
	North Atlantic Refining Ltd.	Come-by-Chance	-	-	490	130	330	260	148
	Petro-Canada	Montreal	340	420	330	400	400	430	451
	Petro-Canada	Oakville	-	-	170	320	300	300	278
	Petro-Canada	Edmonton	190	220	210	230	240	280	283
	Petro-Canada Lubricants	Mississauga	10	20	20	20	20	20	20
	Shell	Montreal	390	370	210	280	360	350	378
	Shell	Sarnia	330	340	360	360	370	390	392
	Shell	Scotford	50	80	100	210	140	150	196
	Suncor	Fort McMurray	70	90	140	160	200	250	225
	Sunoco	Sarnia	340	300	370	460	450	440	437
	Ultramar	St-Romuald	450	380	400	410	430	420	420
	Robbins Feed & Fuel (Blender)	Thorold	#	#	#	-	-	410	-
Importers	BP Cherry Point	Blaine	#	#	#	380	380	360	339
	Daigle Oil	Edmundston	#	#	#	-	-	500	500
	Delta Western Fuel (Totem Oil)	Whitehorse	#	#	#	160	400	430	-
	Husky Oil	Prince George	#	#	#	380	-	-	-
	Imperial Oil	Burnaby	#	#	#	230	-	360	345
	Mackenzie Petroleum	Dawson City	#	#	#	300	400	450	400
	Murphy Oil USA	Superior	#	#	#	270	270	-	-
	Northern Transportation	Iqaluit	#	#	#	20	210	270	271
	Olco Petroleum Group	Beauport	#	#	#	400	310	-	-
	Olco Petroleum Group	Montreal	#	#	#	-	310	-	-
	Parkland	Bowden	#	#	#	400	500	480	500
	Petro-Canada	Montreal	#	#	#	390	400	400	473
	Petro-Canada	Oakville	#	#	#	310	-	-	-
	Petro-Canada	Port Moody	#	#	#	-	-	360	251
	Petroles Norcan	Montreal	#	#	#	450	450	-	-
	Robbins Feed & Fuel	Thorold	-	-	-	-	-	-	289
	Sunoco	Sarnia	-	-	-	-	-	-	430
	Ultramar	St-Romuald	#	#	#	410	430	410	412
	United Refining Company	Warren	-	-	-	-	-	-	282
	National Average			210	260	270	310	320	330

# Sulphur level has not been requested or released under the *Access to Information Act*.

**Table A3.3: Volume-Weighted Annual Sulphur Level in Regular Diesel**

	Name	City	Sulphur Levels (parts per million by weight)						
			1995	1996	1997	1998	1999	2000	2001
Refiners	Chevron	Burnaby	1,680	2,670	4,140	3,750	4,050	3,110	3,290
	Husky Oil	Prince George	570	580	-	-	-	-	-
	Imperial Oil	Dartmouth	2,010	1,460	1,840	890	510	740	989
	Imperial Oil	Sarnia	660	690	-	-	-	1,430	1,297
	Imperial Oil	Nanticoke	3,480	3,880	4,300	-	-	-	-
	Imperial Oil	Strathcona	1,820	2,100	1,980	2,100	2,140	2,170	2,495
	Irving Oil Limited	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
	Parkland	Bowden	5,650	5,680	4,620	4,730	3,880	4,820	3,781
	Petro-Canada	Montreal	2,910	3,720	3,540	2,430	5,330	3,510	3,071
	Petro-Canada	Oakville	3,570	3,500	3,810	3,720	3,160	2,990	2,839
	Shell	Montreal	2,060	2,230	1,900	3,020	2,470	2,110	2,431
	Shell	Sarnia	4,050	4,040	4,200	4,090	3,720	3,780	3,676
	Shell	Scotford	-	-	270	-	480	470	-
Sunoco	Sarnia	1,290	1,620	2,370	2,650	2,010	2,300	2,291	
Ultramar	St-Romuald	800	760	860	-	-	-	-	
Importers	Daigle Oil	Edmundston	#	#	#	-	-	1,750	-
	Mackenzie Petroleum	Dawson City	#	#	#	4,730	3,730	4,130	3,592
	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
	Petro-Canada	Oakville	#	#	#	3,700	2,510	3,030	2,812
	Petro-Canada	Port Moody	#	#	#	-	490	-	-
National Average			2,150	2,360	2,580	2,990	2,300	2,170	2,480

# Sulphur level has not been requested or released under the *Access to Information Act*.

**Table A3.4: Volume-Weighted Annual Sulphur Level in Light Fuel Oil**

	Name	City	Sulphur Levels (parts per million by weight)						
			1995	1996	1997	1998	1999	2000	2001
Refiners	Husky Oil	Prince George	-	-	514	599	590	600	599
	Imperial Oil	Dartmouth	2,125	2,004	1,928	1,360	940	1,230	1,168
	Imperial Oil	Sarnia	1,668	1,803	1,417	2,260	1,830	1,690	2,277
	Imperial Oil	Nanticoke	2,950	3,189	3,327	1,791	2,000	1,950	1,269
	Irving Oil Limited	Saint-John	-	-	1,731	2,080	1,770	1,660	1,630
	Nova	Sarnia	1,520	1,450	1,550	1,850	1,770	1,450	1,449
	Petro-Canada	Montreal	2,577	3,591	2,753	3,336	3,360	3,470	3,129
	Petro-Canada	Oakville	3,642	4,069	3,663	4,253	4,120	3,650	3,368
	Shell	Montreal	2,357	2,256	2,784	2,837	2,720	2,770	2,895
	Shell	Sarnia	3,000	-	-	-	-	-	-
	Sunoco	Sarnia	1,591	1,758	2,144	2,578	2,190	2,960	1,810
Ultramar	St-Romuald	1,120	1,281	1,355	2,231	1,810	1,630	1,539	
Importers	Daigle Oil	Edmundston	#	#	#	-	-	3,000	3,000
	North 60 Petro	Whitehorse	#	#	#	1,000	1,000	1,000	2,700
	Olco Petroleum Group	Montreal	#	#	#	-	2,300	-	-
	Olco Petroleum Group	Beauport	#	#	#	-	2,300	-	-
	Petro-Canada	Oakville	#	#	#	3,880	3,880	-	3,440
	Statia Terminals Canada	Point Tupper	-	-	-	-	-	-	1,020
	Ultramar	St. Romuald	-	-	-	-	-	-	1,643
National Average			1,980	2,150	2,000	2,270	2,030	2,030	1,890

# Sulphur level has not been requested or released under the *Access to Information Act*.

**Table A3.5: Volume-Weighted Annual Sulphur Level in Heavy Fuel Oil**

	Name	City	Sulphur Levels (parts per million by weight)						
			1995	1996	1997	1998	1999	2000	2001
Refiners	Chevron	Burnaby	14,663	17,832	15,153	15,107	17,880	-	-
	Consumer's Co-op	Regina	8,313	12,315	11,207	8,986	8,870	10,640	7,032
	Husky Oil	Prince George	26,300	16,636	13,800	19,549	20,340	17,200	14,818
	Imperial Oil	Dartmouth	14,698	13,590	12,664	15,820	13,540	14,130	14,959
	Imperial Oil	Sarnia	21,970	20,153	21,840	22,530	19,900	17,980	19,465
	Imperial Oil	Nanticoke	23,022	23,325	25,815	27,319	22,780	17,030	14,610
	Imperial Oil	Strathcona	15,302	15,080	15,493	13,697	12,660	12,930	13,864
	Irving Oil Limited	Saint-John	20,850	18,612	18,396	18,409	17,800	16,270	17,454
	North Atlantic Refining Ltd.	Come-by-Chance	17,876	22,302	28,323	26,460	28,070	28,410	26,267
	Nova	Sarnia	11,840	11,990	13,520	14,690	13,870	11,750	11,751
	Petro-Canada	Montreal	20,644	22,130	21,072	19,730	15,450	18,810	17,034
	Petro-Canada	Oakville	14,702	15,029	15,848	16,099	14,270	14,240	13,425
	Petro-Canada	Edmonton	23,009	26,568	25,890	23,736	22,160	24,500	22,128
	Shell	Montreal	17,723	19,447	18,230	17,679	15,960	14,210	15,828
	Shell	Sarnia	25,835	27,398	28,326	26,485	25,130	25,540	25,736
	Sunoco	Sarnia	17,317	18,351	20,169	20,539	17,220	20,240	18,239
Ultramar	St-Romuald	8,324	10,070	11,361	11,440	11,100	10,990	10,165	
Importers	Fraser Papers	Edmundston	#	#	#	-	4,280	3,980	4,214
	Kildair Services	Tracy	#	#	#	4,150	8,290	18,080	8,006
	Marine Petrobulk	North Vancouver	#	#	#	-	-	17,920	24,000
	Murphy Oil USA	Superior	#	#	#	45,710	18,230	-	-
	New Brunswick Power	Fredericton	#	#	#	27,360	27,820	27,800	27,269
	Newfoundland & Labrador Hydro	St. John's	#	#	#	19,960	19,940	20,970	20,600
	Norske Canada	Campbell River	-	-	-	-	-	-	10,237
	Norske Canada	Crofton	-	-	-	-	-	-	9,871
	North 60 Petro	Whitehorse	#	#	#	6,530	3,440	2,430	4,313
	Nova Scotia Power	Halifax	#	#	#	27,030	25,990	26,810	28,102
	Pope and Talbot	Nanaimo	#	#	#	-	-	10,600	10,216
	Statia Terminals Canada	Point Tupper	-	-	-	-	-	-	8,268
	Vancouver General Hospital	North Vancouver	#	#	#	-	-	10,600	10,600
	Western Pulp	Port Alice	#	#	#	-	-	14,510	14,840
	Western Pulp	Squamish	-	-	-	-	-	-	11,000
		National Average		16,761	17,300	17,250	17,220	17,710	17,400

# Sulphur level has not been requested or released under the *Access to Information Act*.

**Table A3.6: Volume-Weighted Annual Sulphur Level in Aviation Gasoline**

	Name	City	Sulphur Levels (parts per million by weight)						
			1995	1996	1997	1998	1999	2000	2001
Refiners	Shell	Montreal	-	-	-	-	-	-	14
	Petro-Canada	Edmonton	-	-	-	-	-	-	352
Importers	Imperial Oil	Burnaby	-	-	-	-	-	-	30
	Imperial Oil	Strathcona	-	-	-	-	-	-	10
	National Average		-	-	-	-	-	-	51

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



## **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 (% mass)</u>
CAN/CGSB-3.5-99 CAN/CGSB-3.25-94	<b>Gasoline</b> Unleaded, Automotive Aviation	0.10 0.05
CAN/CGSB-3.23-97 CAN/CGSB-3.22-97	<b>Aviation Turbo Fuel</b> Kerosene Type (Jet A, A-1, F-34) Wide Cut Type (Jet b, F-40)	0.30 0.40
CAN/CGSB-3.3-99	<b>Kerosene</b> Type No. 1-K Type No. 2-K	0.04 0.30
CAN/CGSB 3.6-2000 CAN/CGSB-3.517-2000	<b>Diesel Fuel</b> Regular Sulphur - Type A Regular Sulphur - Type B Automotive Low Sulphur	0.30 0.50 0.05
CAN/CGSB-3.16-99	<b>Mining Diesel Fuel</b> Special Special - Low Sulphur	0.25 0.05
CAN/CGSB-3.2-99	<b>Fuel Oil, Heating Type</b> 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-11c (1996)	<b>Fuel, Naval Distillate</b> Type 11 Type 15	1.00 1.00
CAN/CGSB-3.27-M89	<b>Naphtha Fuel</b> Type 1 Type 2	5 mg/kg 500 mg/kg
3-GP-24c (1994)	<b>Aviation Fuel</b> High Flash Type	0.40
CAN/CGSB-3.18-2000	<b>Diesel Fuel for Locomotive Type</b> Medium Speed Diesel Engines	0.50



## **Appendix 5**

### **Maximum Sulphur Content in Fuel Oils Provincial Regulations and By-Laws**



**Appendix 5: Maximum Sulphur Content in Fuel Oils  
Provincial Regulations and By-Laws**

<b>Province</b>	<b>Regulation/By-Law</b>	<b>Regulation Adoption</b>	<b>Maximum Sulphur Content (% mass)</b>
Canada	<i>Canadian Environmental Protection Act 1999,</i> Diesel Fuel Regulations Sulphur in Gasoline Regulation	1998, amended 2000 1999	0.05 0.015 avg/0.03cap(2002-04) <sup>1</sup> 0.003 avg/0.008cap(2005) <sup>1</sup>
New Brunswick	<i>Clean Air Act,</i> Air Quality Regulation	1983, amended 1990 & 1998	#1 - 0.5 #2 - 0.5 #4 - 1.5 #5 - 2.0 #6b - 3.0 #6c - 3.0
Quebec	<i>Petroleum Products and Equipment Act,</i> Petroleum Products Regulation	1991 amended 1996, 1998 & 1999	Gasoline: Grades 1,2,3,4 - 0.15 Diesel: Type AA - 0.2 Types A,B,C,D,E - 0.5 Heating Oil: Type 00 - 0.2 Types 0,1,2 - 0.5
	By-Law 90, Montreal Urban Community	1987	1.0-1.5
Ontario	<i>Environmental Protection Act,</i> Regulation 361, Sulphur Content of Fuels	1970 amended 1980, 1990 & 1999 (effective in Metro Toronto only)	#1 - 0.5 #2 - 0.5 #4 - 1.5 #5 - 1.5 #6b - 1.5 #6c - 1.5
	<i>Environmental Protection Act,</i> Boilers Regulation	1986 amended 1999	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.	0.015 <sup>2</sup> 0.020 <sup>2</sup>

<sup>1</sup> Has various options - see regulation for details.

<sup>2</sup> Annual limit, also can use the U.S. Complex Model to provide equivalent emission levels.



## **Appendix 6**

### **Comparison of Average Sulphur Content from the 2001 Liquid Fuels Report with the Limits Set Forth by the Canadian General Standards Board and the Provincial Regulations**





**Appendix 6: Comparison of 2001 Reported Liquid Fuel Average Sulphur Levels and Standards Set Forth by the Canadian General Standards Board 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 (%)
	Low Value	National Average	High Value	
Aviation Turbo Fuel	0.001	0.005	0.226	0.3 - Jet A 0.4 - Jet B
Motor Gasoline	0.001	0.029	0.074	0.10 - Leaded/Unleaded
Aviation Fuel	0.001	0.01	0.035	0.05
Kerosene/Stove Oil	0.001	0.042	0.3	0.04 - Type No. 1-K 0.3 - Type No. 2-K
Low Sulphur Diesel Fuel	0.002	0.034	0.05	0.05
Diesel Fuel	0.05	0.249	0.368	0.30 - Type A 0.50 - Type B
Light Fuel Oil	0.06	0.201	0.337	0.50
Heavy Fuel Oil	1.175	1.728	2.574	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 (2001)	Provincial Regulations	
		Province	Sulphur Content Limit (%)
Atlantic	2.222	New Brunswick	1.5 - Type 4 2.0 - Type 5 3.0 - Type 6
Quebec	1.203	Quebec	2.0 1.0/1.5 - Montreal
Ontario	1.645	Ontario	1.0 - Boilers 1.5 - All Types - Toronto
West	1.490	B.C.	1.1 - All Types