

# Sulphur in Liquid Fuels

## 2007

November 2009



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## **Acknowledgements**

**Prepared By:**                      **Raseeka Rahumathulla**  
   **Oil, Gas and Alternative Energy Division**  
   **Energy and Transportation Directorate**  
   **Environment Canada**

**In collaboration with:**        **Jeffrey Guthrie**  
   **Environment Canada**

**and**                                      **Shivam Shah**  
   **Co-op Student – University of Waterloo**

**and**                                      **Sneha Mathrani**  
   **Co-op Student – University of Waterloo**

## **Notice**

The information contained in this report is compiled from data submitted, as of July 2009, 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 plausibility but are subject to potential errors made at the source.

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

**Fuels Section**  
Oil, Gas, and Alternative Energy Division  
Environment Canada  
Place Vincent Massey, 9th Floor  
Gatineau, Quebec  
K1A 0H3  
Fax: 819-953-8903  
Email: [ogaed@ec.gc.ca](mailto:ogaed@ec.gc.ca).

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## 1.0 Executive Summary

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This report summarizes the 2007 data on the sulphur content in liquid fuels originating from crude oils, coal or bituminous sand. The information 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 2007, there were various developments with respect to federal regulations on sulphur in liquid fuels and other non-regulatory issues:

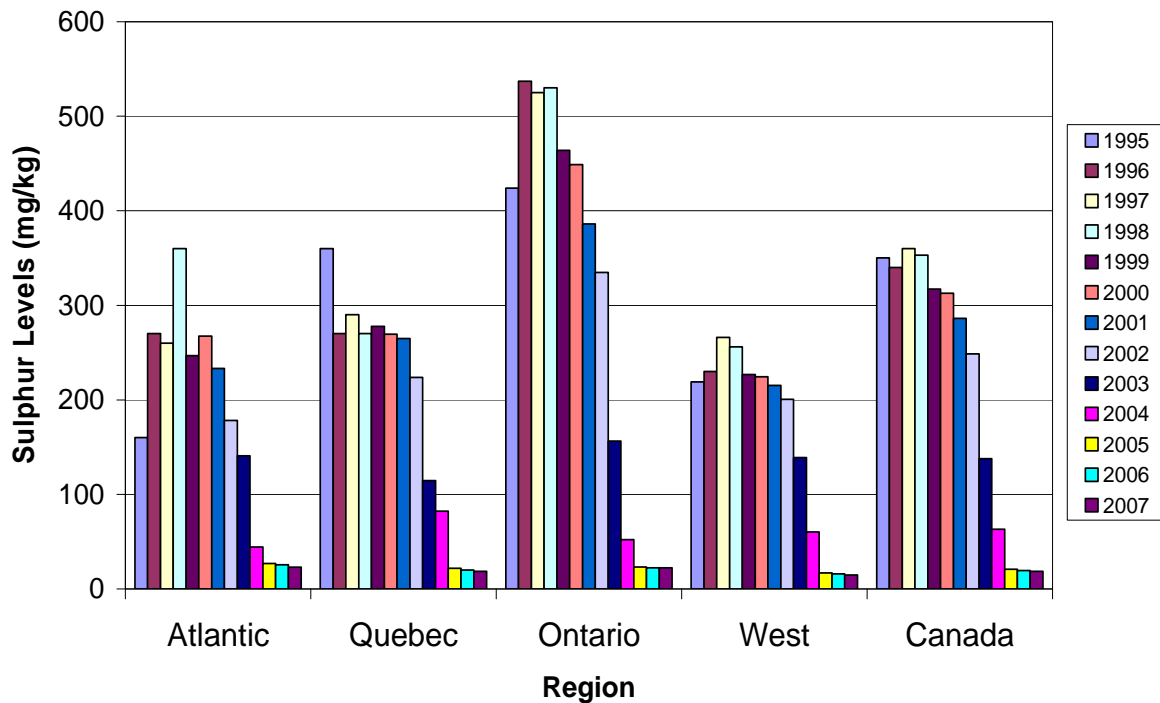
- The new 500 mg/kg limit for off-road diesel fuel and rail and marine diesel fuel came into effect under the ***Sulphur in Diesel Fuel Regulations***. The limits and timing were:
  - 500 mg/kg for production or imports as of June 1, 2007; and
  - 500 mg/kg for sales as of October 1, 2007.

In late 2006, the new 15 mg/kg limit for on-road diesel fuel was implemented, the effect of which is seen in the 2007 sulphur levels.

- The limits and timing of the various developments with respect to the ***Sulphur in Diesel Fuel Regulations***, in 2006, were:
  - 15 mg/kg for production and import as of June 1, 2006;
  - 22 mg/kg for sales as of September 1, 2006; and
  - 15 mg/kg for sales as of October 15, 2006.

In 2007, the national average sulphur content in gasoline was determined to be **18 mg/kg**, slightly less than 2006 levels (20 mg/kg). Graph 1.1 shows the trend for sulphur content in gasoline nationally and by region for the period 1995 to 2007. Note that the term “West Region” used throughout this report is an unofficial designation for Manitoba, Saskatchewan, Alberta, British Columbia, Yukon, Northwest Territories and Nunavut.

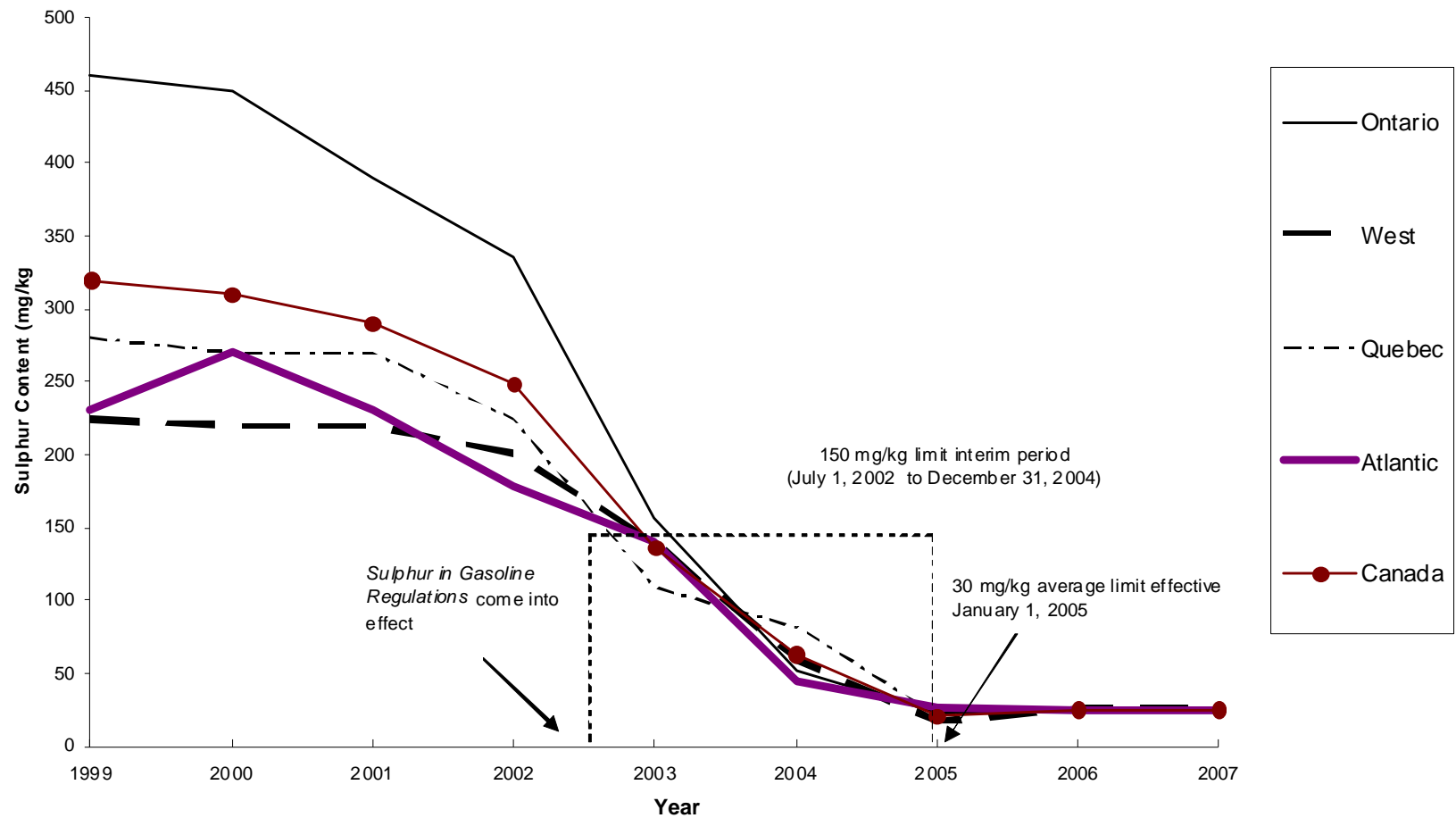
**Graph 1.1: Sulphur Levels in Gasoline by Region and Nationally, 1995-2007**



The lower sulphur levels beginning in 2005 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 trends in the levels of sulphur in gasoline from 1999 to 2007.



**Graph 1.2: National and Regional Trends of Sulphur Content in Gasoline  
1999–2006**



The reported mass of sulphur content in all liquid fuels nationally decreased by 4% in 2007 from 2006 values, as shown in Graph 1.3. In the West Region, the reported mass of sulphur in all liquid fuels increased by 3% for 2007, mainly due to an increase in the production and importation of Aviation Turbo Fuel and Heavy Fuel Oil in that region. In the Atlantic, Ontario, and Quebec Region, the decreases were 10%, 1% and 1% respectively.

**Graph 1.3: Sulphur Mass in Liquid Fuels by Region and Nationally, 1996-2007**

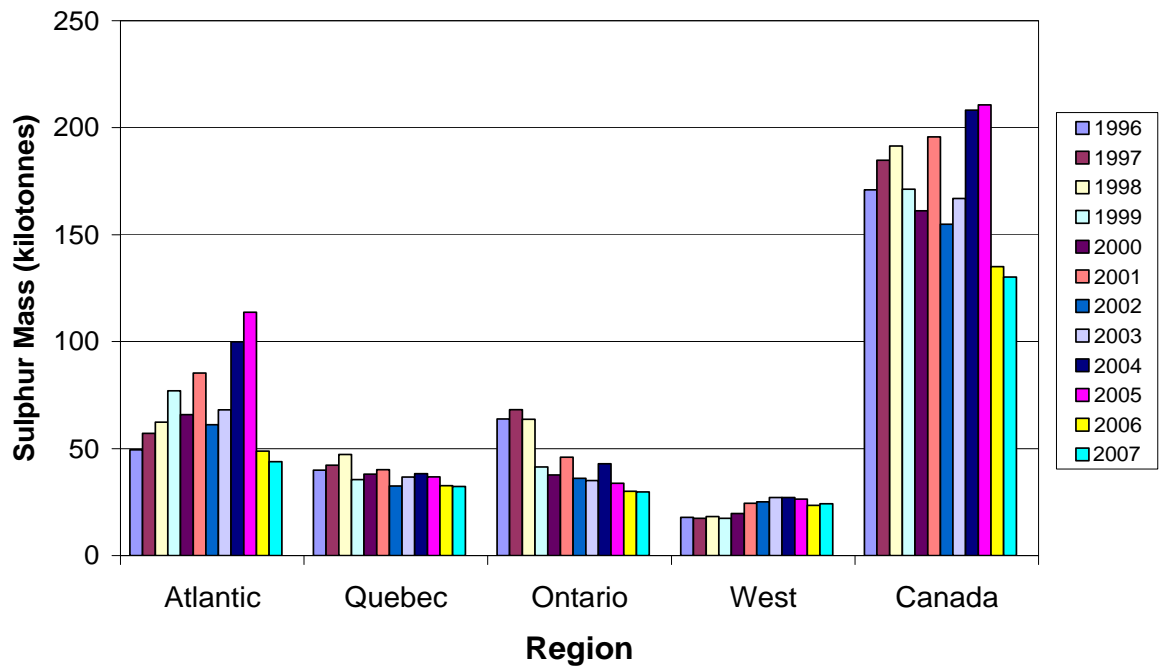


Table 1.1 shows the national summary of data compiled from Form 1, “Report on Sulphur Content,” which petroleum refineries and importing companies are required to submit to Environment Canada under the *Fuels Information Regulations, No. 1*.

The largest reported volume of liquid fuel produced in or imported into Canada was gasoline, which constituted about 45% of all products, and accounted for about 0.4% of the sulphur mass in liquid fuels. Heavy fuel oil constituted about 8% by volume of the total liquid fuels and contained about 86% of the total sulphur mass in Canada.

**Table 1.1:  
Fuel Production/Imports and Sulphur Content**

<b>National Summary for 2007</b>					
<b>Type of Fuel</b>	<b>Fuel Production/Imports</b>		<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (mg/kg)</b>	<b>Distribution of Sulphur in Products (%)</b>
	<b>(m³)</b>	<b>(% of total)</b>			
Aviation Turbo Fuel	6 695 902	7.20	3 148	581	2.42
Motor Gasoline	41 452 001	44.55	528	18	0.41
Aviation Gasoline	98 055	0.11	2	27	0.00
Kerosene/Stove oil	958 259	1.03	53	67	0.04
Ultra-Low Sulphur Diesel	29 049 870	31.22	102	4	0.08
Low-Sulphur Diesel Fuel	2 760 413	2.97	532	226	0.41
High-Sulphur Diesel	891 910	0.96	1 253	1 631	0.96
Light Fuel Oil	2 521 716	2.71	2 998	1 393	2.30
Heavy Fuel Oil	7 566 589	8.13	111 808	14 831	85.91
Plant Consumption/Other	1 042 582	1.12	9 716	9 237	7.47
<b>TOTAL</b>	<b>93,037,297</b>	<b>100.00</b>	<b>130,140</b>	<b>1,422</b>	<b>100.00</b>

- In the Type of Fuel category, “Plant Consumption” and “Other” were combined for 2007. Fuels reported under these categories included pitch, gasoline-like blendstock, light fuel oil, heavy fuel oil, Orimulsion, intermediate fuel oils (IFO 420, IFO 30-460), diesel and bunker.
- Totals may not add up due to rounding.

## 2.0 Introduction

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### ***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 on liquid fuel composition, particularly regarding sulphur dioxide (SO<sub>2</sub>) emissions from combustion. The 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 metres (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 types of liquid fuel that are to be reported are shown 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 the fuels.

The full text of the *Fuels Information Regulations, No. 1* and reporting forms are available at:

[http://www.ec.gc.ca/cleanair-airpur/Fuel\\_Information\\_Regulations,\\_No.\\_1-WS0FDA3887-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Fuel_Information_Regulations,_No._1-WS0FDA3887-1_En.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* set maximum limits for sulphur in on-road, off-road, rail (locomotive) and marine (vessel) diesel fuels. The production, import and sales limits and effective dates of the regulations are summarized in Table 2.1. The timing and limits are aligned with those of the 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.

**Table 2.1**  
**Limits on Sulphur in Diesel Fuel and Effective Dates**

<b>Sulphur Limit (mg/kg)</b>		<b>On-Road Diesel Fuel</b>	<b>Off-Road Diesel Fuel</b>	<b>Rail and Marine Diesel Fuel</b>
500	Production or Import	Since 1998	June 1, 2006	June 1, 2006
	Sales	Since 1998	October 1, 2007 <sup>2</sup>	October 1, 2007 <sup>2</sup>
22	Sales	September 1, 2006	N/A	N/A
15	Production or Import	June 1, 2006	June 1, 2010	June 1, 2012
	Sales	October 15, 2006 <sup>1</sup>	October 1, 2010 <sup>3</sup>	N/A

<sup>1</sup> September 1, 2007, in the Northern Supply Area, which is defined as the area corresponding to the following geographical areas: a) that part of the Yukon that is north of latitude 67° N; b) the Northwest Territories, except those areas within 1 km of the centre line of highways 2 to 7, and that portion of Hwy 1 south of Fort Simpson, and those areas within the municipalities of Yellowknife, Detah, Hay River, NWT, Fort Simpson, Rae, Edzo, Enterprise, Fort Resolution, Fort Smith and Fort Liard; c) Nunavut; d) those parts of Manitoba, Ontario and Quebec within 50 km from the coast of Hudson Bay or James Bay; e) that part of Quebec north of latitude 51° N if west of longitude 63.5° W, and north of latitude 50° N if east of longitude 63.5° W; and f) Newfoundland and Labrador, except the island of Newfoundland.

<sup>2</sup> December 1, 2008, in the Northern Supply Area.

<sup>3</sup> December 1, 2011, in the Northern Supply Area.

Note that there is no volume threshold for reporting under the *Sulphur in Diesel Fuel Regulations*. The full text of the *Sulphur in Diesel Fuel Regulations* including amendments, along with the associated regulatory impact analysis statement and reporting forms, are available through Environment Canada's Diesel Fuel Web site:

[http://www.ec.gc.ca/cleanair-airpur/Diesel-WS94F5583C-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Diesel-WS94F5583C-1_En.htm).

### **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, limited the average sulphur content of gasoline to 150 mg/kg over a two-and-a-half year period.

The full text of the *Sulphur in Gasoline Regulations* along with the associated regulatory impact analysis statements and reporting forms are available through Environment Canada's Gasoline Web site:

[http://www.ec.gc.ca/cleanair-airpur/Gasoline-WSBD413FE9-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Gasoline-WSBD413FE9-1_En.htm)

### **Canadian General Standards Board**

The Canadian General Standards Board (CGSB) sets commercial standards for fuels, including some that have been adopted by provincial regulations. The standards for sulphur in fuels vary considerably among 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* in 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 a view to matching the requirements set by the European Union (i.e. 1% by weight for heavy fuel oil and 0.1% by weight 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 multi-stakeholder workshop in May 2003. Complementary measures such as economic instruments have also been examined. Work undertaken by the National Round Table on the Economy and the Environment (NRTEE) in 2003 involved studying the environmental and economic implications of using fiscal instruments to reduce sulphur levels in light and heavy fuel oil.

[http://www.nrtee-trnee.ca/eng/programs/Past-Programs/efr-energy/Case\\_Studies/HFO-Executive-Summary-E.pdf](http://www.nrtee-trnee.ca/eng/programs/Past-Programs/efr-energy/Case_Studies/HFO-Executive-Summary-E.pdf)

More information is available at:

[http://www.ec.gc.ca/cleanair-airpur/Fuel\\_Oils-WSDC997DB6-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Fuel_Oils-WSDC997DB6-1_En.htm)

### **Low Sulphur Procurement Guide**

In June 2003, Environment Canada and Friends of the Earth jointly produced a *Low Sulphur Fuels Procurement Guide* aimed at encouraging governments and other organizations to take a leadership role in procuring low sulphur fuels, where possible. It provides a checklist of suggested low sulphur fuel procurement practices, contracting recommendations, suggestions for estimating emissions reductions, case studies, and links to key sources of information.

The Guide is available at:

[http://www.ec.gc.ca/cleanair-airpur/caol/OGEB/library\\_e.htm](http://www.ec.gc.ca/cleanair-airpur/caol/OGEB/library_e.htm)

## ***2.3 Period Covered***

This report covers the period from January 1 to December 31, 2007. 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. The *Sulphur in Diesel Fuel Regulations* also require quarterly reports on the level of sulphur in diesel fuel with sulphur concentrations exceeding 500 mg/kg, between 500 mg/kg and 15 mg/kg and equal or less than 15 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 2.2 lists the petroleum refineries, blenders, and upgrading plants that reported, under the three regulations, information pertaining to *production* volume and fuel sulphur content for 2007.

**Table 2.2**  
**Refineries, Blenders and Importers reporting under the respective Regulations**

Company	Location	Prov.	FIR <sup>1</sup>	Gasoline <sup>2</sup>	Diesel <sup>3</sup>
Biox Canada	Hamilton	ON			X
Chevron Canada Limited	Burnaby	BC	X	X	X
Consumers' Co-operative Refineries Limited	Regina	SK	X	X	X
Husky Oil Operations Ltd.	Prince George	BC	X	X	X
Imperial Oil	Dartmouth	NS	X	X	X
Imperial Oil	Edmonton	AB	X	X	X
Imperial Oil	Nanticoke	ON	X	X	X
Imperial Oil	Sarnia	ON	X	X	X
Irving Oil Limited	Saint John	NB	X	X	X
Milligan Biotech	Foam Lake	SK			X
Newalta	Vancouver	BC	X		X
North Atlantic Refining Limited	Come-by-Chance, NL	NS	X	X	X
NOVA Chemicals Canada Limited	Corunna	ON	X		X
Ocean Nutrition	Mulgrave	NS			X
Petro-Canada	Edmonton	AB	X	X	X
Petro-Canada	Montréal	QC	X	X	X
Petro-Canada	Oakville	ON	NP		NP
Petro-Canada	Ottawa	ON			NP
Petro-Canada	Thunder Bay	ON			NP
Petro-Canada	Port Moody	BC	X		X
Petro-Canada Lubricants	Mississauga	ON	X	NP	X
Rothsay	Sainte-Catherine	QC			X
Shell Canada Products	Edmonton	AB		NP	
Shell Canada Products	Corunna,	ON	X	X	X
Shell Canada Products	Fort Saskatchewan	AB	X	X	X
Shell Canada Products	Montréal	QC	X	X	X
Suncor Energy Products Incorporated	Fort McMurray	AB	X		X
Suncor Energy Products Incorporated	Sarnia	ON	X	X	X
Syncrude Canada Ltd.	Fort McMurray	AB	X		X
Ultramar Limitée	Lévis/Saint- Romuald	QC	X	X	X
Ultramar Limitée	Montréal	QC	X	X	

X = Report received; NP = Reported No Production.

<sup>1</sup> *Fuels Information Regulations, No. 1.*

<sup>2</sup> *Sulphur in Gasoline Regulations.*

<sup>3</sup> *Sulphur in Diesel Fuel Regulations.*

The following petroleum importers reported, under the three regulations, information pertaining to *import* volume and fuel sulphur content for 2007.

**Table 2.3**  
**Importers Reporting under the Respective Regulations**

<b>Company</b>	<b>Location</b>	<b>Province</b>	<b>FIR<sup>1</sup></b>	<b>Gasoline<sup>2</sup></b>	<b>Diesel<sup>3</sup></b>
Air Canada	Westridge	BC	X		
Air Canada	Beauport	QC	X		
Air Canada (Vopak)	Hamilton	ON	X		
BP Cherry Point	Vancouver	BC	X		
Canada Clean Fuels	Toronto	ON			X
Canadian National Railway	Surrey	BC			X
Canadian Pacific Railway	Calgary	AB	NI		
Catalyst Paper Corporation (Norske Canada)	Campbell River	BC	X		
Catalyst Paper Corporation (Norske Canada)	Crofton	BC	X		
Cervini Farms	Leamington	ON	X		
Chevron Canada Limited	Burnaby	BC	X	X	X
Compagnie Minière Québec Cartier	Port Cartier	QC	X		
Consumers' Co-operative Refineries Limited	Regina	SK			X
Daigle Oil	Edmundston	NB	X		
Ford Motor Company of Canada	Windsor	ON			X
General Motors Canada	Ontario	ON		X	X
Great Lakes Greenhouses Inc	Leamington	ON	X		
Honda of Canada Mfg.	Queenston	ON		X	
Imperial Oil	B.C. Imports	BC			X
Imperial Oil	Burnaby	BC	X	X	
Imperial Oil	Calgary,	BC			X
Imperial Oil	Dartmouth	NS	X		
Imperial Oil	Halifax	NS	X		
Imperial Oil	Nanticoke	ON		X	
Imperial Oil	N.S. Imports	NS			X
Imperial Oil	Point Tupper	NS	X	X	
Imperial Oil	Québec	QC	X		X
Imperial Oil	Sarnia	ON		X	
Imperial Oil	Sept Isles	QC	X		
Irving Oil Limited	Saint John	NB	X	X	
Kildair Services Ltée	Tracy	QC	X		
Mackenzie Petroleum Limited	Dawson City	YT	X		X
Marine Petrobulk Limited	Vancouver	BC	X		X
New Brunswick Power Corporation	Fredericton	NB	X		
Newfoundland & Labrador Hydro	St. John's	NFL	X		
Nexfor Fraser Papers Incorporated	Edmundston	NB	X		
North Atlantic Refining Limited	Come-by-Chance	NS	X		
Northern Transportation Company Limited	Hay River	NWT	X		X
Northland Biodiesel Marketing Inc.	Thunder Bay	ON			X
Nova Scotia Power	Halifax	NS	X		
Olco Petroleum Group	Beauport	QC	X	X	
Ontario Limited	Leamington	ON	X		
Parkland Refineries Limited	Y.T. Imports	YT	X		X
Petro-Canada	Montréal	QC	X	X	



<b>Company</b>	<b>Location</b>	<b>Province</b>	<b>FIR<sup>1</sup></b>	<b>Gasoline<sup>2</sup></b>	<b>Diesel<sup>3</sup></b>
Petro-Canada	Port Moody	BC	X	X	X
Pétroles Norcan	Montréal	QC	X	X	X
Pope and Talbot Limited	Nanaimo	BC	X		
Port Colborne Quarries Limited	Port Colborne	ON	X		
Shell Canada Products	Montréal	QC	X	X	
Shell Canada Products	Burnaby	BC	X		X
Suncor Energy Products Incorporated	Sarnia	ON	X	X	X
Sylvite Sales Inc.	Burlington	ON			X
Ultramar Limitée	Halifax	NS			NI
Ultramar Limitée	Holyrood	NL		NI	NI
Ultramar Limitée	Lévis/Saint-Romuald	QC	X	X	X
Ultramar Limitée	Montréal	QC	X	X	X
Western Gas and Liquids Company	Ontario Imports	ON			X

X = Report received; NI = Reported No Imports.

<sup>1</sup> *Fuels Information Regulations, No. 1.*

<sup>2</sup> *Sulphur in Gasoline Regulations.*

<sup>3</sup> *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 1995 to 2007 for each Canadian refinery and importer.

### 3.0 Volumes of Liquid Fuels Produced/Imported

In order to verify their accuracy, the reported volumes of produced fuels were compared to Statistics Canada figures for 2007 (see Table 3.1).

With the exception of “Kerosene/Stove Oil,” and “Plant Consumption/Other,” there appears to be reasonable agreement between the two sets of data. This may result from the different approaches used, as noted below.

**Table 3.1**  
**Volumes of Liquid Fuels Produced / Imported for Sale in Canada**

<b>Reported to Statistics Canada<sup>(1)</sup> and Environment Canada for 2007</b>		
<b>Type of Fuel</b>	<b>Statistics Canada</b>	<b>Environment Canada</b>
	<b>(m<sup>3</sup>)</b>	<b>(m<sup>3</sup>)</b>
Aviation Turbo Fuel	6,862,800	6,695,902
Motor/Aviation Gasoline	42,538,600	41,550,056
Kerosene/Stove oil	289,400	958,259
Ultra-Low Sulphur Diesel Fuel	N/A <sup>2</sup>	29,049,870
Low Sulphur Diesel Fuel	N/A <sup>2</sup>	2,760,413
Diesel Fuel	27,669,100	891,910
Light Fuel Oil	4,355,300	2,521,716
Heavy Fuel Oil	6,003,000	7,566,589
Plant Consumption/Other	5,675,393	1,042,582
<b>TOTAL</b>	<b>93,393,593</b>	<b>93,037,297</b>

Source: Statistics Canada, Catalogue No. 45-004-XIE monthly, January 2008.

<sup>1</sup> Statistics Canada data were compiled for the year 2007.

<sup>2</sup> Statistics Canada does not differentiate between the sulphur level of diesel fuel, that is, ultra-low-sulphur, low-sulphur and regular sulphur diesel grades in regards to production. All diesel fuel produced or imported in Canada is under the “Diesel Fuel” category.

**Notes:**

1. According to Statistics Canada, approximately 75–80% of refinery-produced kerosene and stove oil are later transferred to diesel and light fuel oils.
2. Statistics Canada does not distinguish between ultra-low-sulphur, low-sulphur and regular sulphur diesel grades in regards to production.
3. 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. Plant consumption is listed as “Own Consumption” in the Statistics Canada report. This covers the whole range of petroleum products listed in the Statistics Canada publication. Statistics Canada defined “Own Consumption” as the amount of petroleum product produced or purchased and used in refinery operations. Environment Canada volumes reported under “Plant Consumption” included pitch, gasoline-like blendstock, light fuel oil, heavy fuel oil, Orimulsion, intermediate fuel oils (IFO 420, IFO 30-460), and diesel. The Environment Canada quarterly report Form 1 does not list “Plant Consumption” as a liquid fuel to report, although it has been historically reported by some companies.
5. Statistics Canada’s “Other Petroleum Products” is defined as all other petroleum products such as wax and candles, unfinished products, etc. The “Other” category under the *Fuels Information Regulations, No. 1* includes bunker.
6. Totals may not add up due to rounding and volumes not included.

## 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 2007:

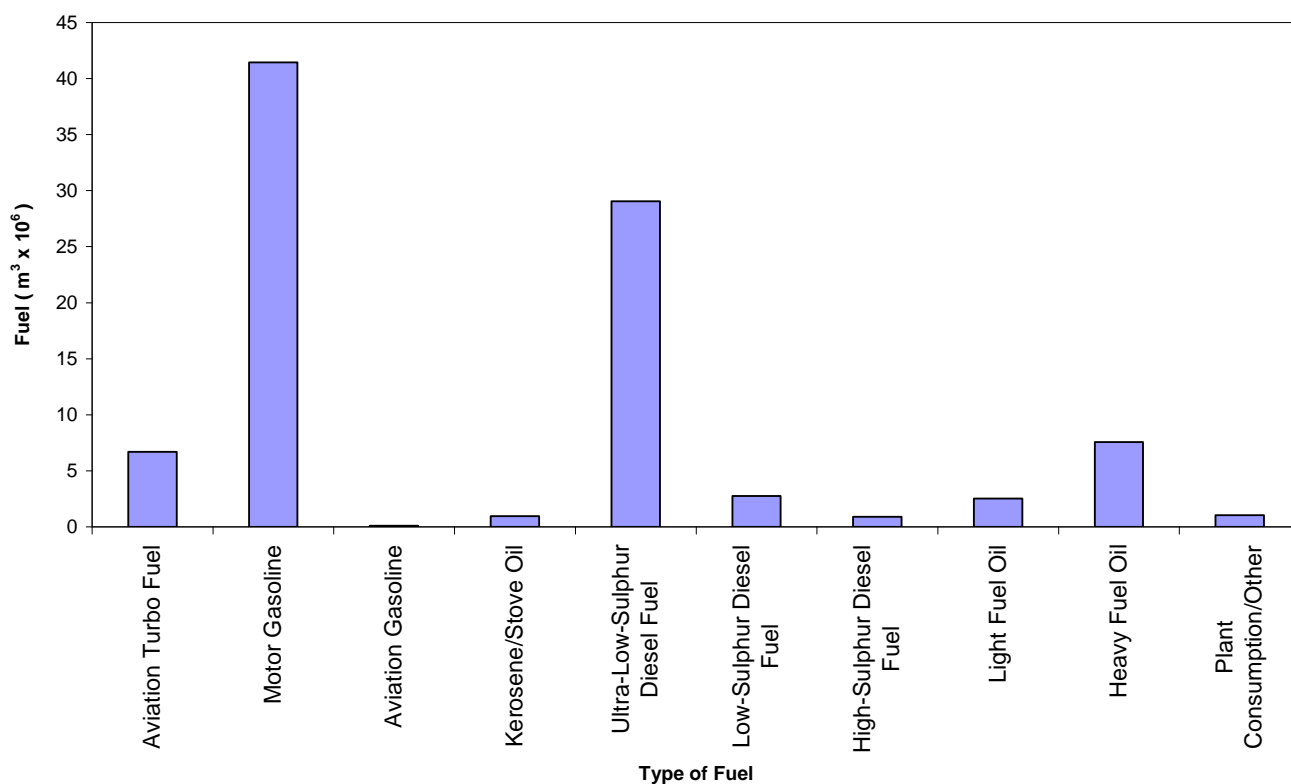
- National Data for Liquid Fuels: Table 4.1, Graphs 4.1 and 4.2
- Regional Data for Liquid Fuels: Tables 4.2A to E, Graphs 4.3 and 4.4
- Regional Data for Motor/Aviation Gasoline: Graph 4.5
- Refinery Data for Motor Gasoline: Graph 4.6
- Refinery Data for Diesel Fuel: Graphs 4.7 and 4.9
- Historical Trends (National): Graphs 4.10 to 4.15

**Table 4.1**  
**Fuel Production / Imports and Sulphur Content**

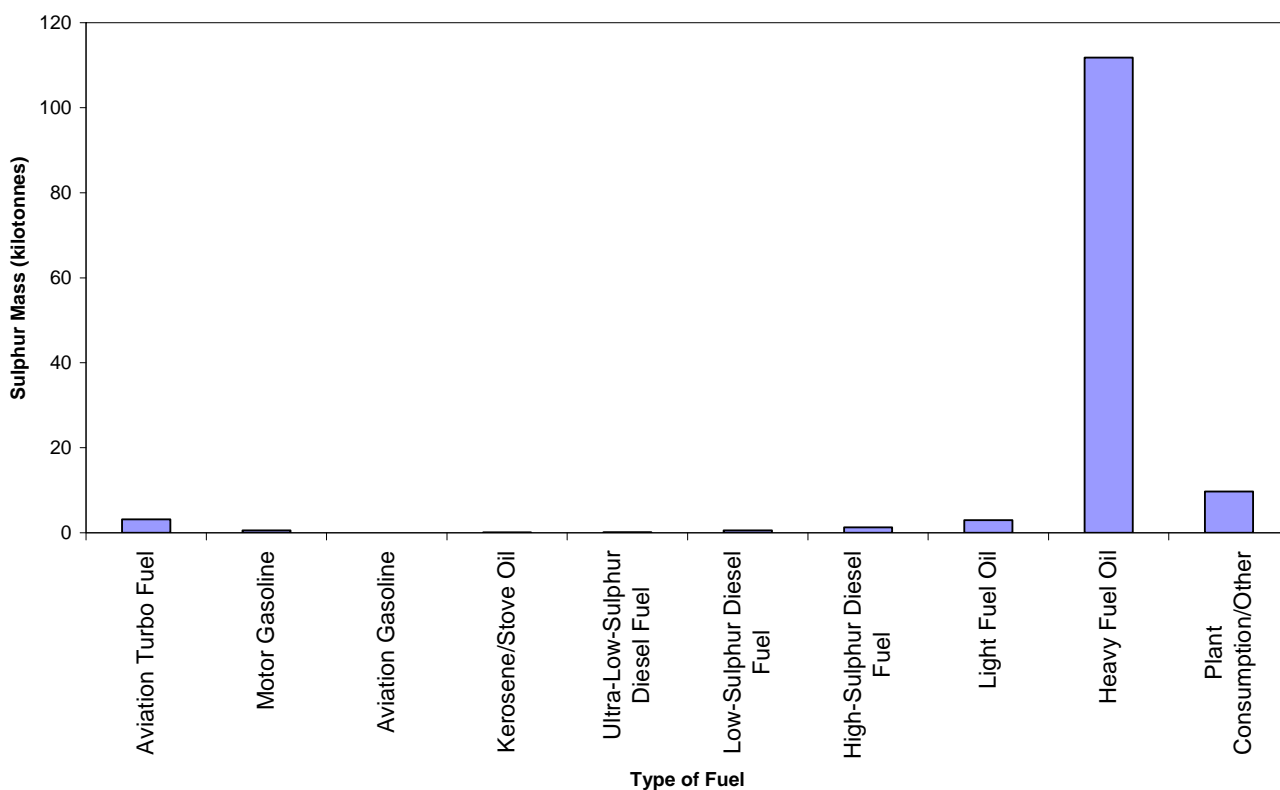
<b>National Summary for 2007</b>					
<b>Type of Fuel</b>	<b>Fuel Production / Imports</b>		<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (mg/kg)</b>	<b>Distribution of Sulphur in Products (%)</b>
	<b>(m³)</b>	<b>(% of total)</b>			
Aviation Turbo Fuel	6,695,902	7.20	3,148	581	2.42
Motor Gasoline	41,452,001	44.55	528	18	0.41
Aviation Gasoline	98,055	0.11	2	27	0.00
Kerosene/Stove oil	958,259	1.03	53	67	0.04
Ultra Low-Sulphur Diesel	29,049,870	31.22	102	4	0.08
Low-Sulphur Diesel Fuel	2,760,413	2.97	532	226	0.41
High-Sulphur Diesel Fuel	891,910	0.96	1,253	1,631	0.96
Light Fuel Oil	2,521,716	2.71	2,998	1,393	2.30
Heavy Fuel Oil	7,566,589	8.13	111,808	14,831	85.91
Plant Consumption/Other	1,042,582	1.12	9,716	9,237	7.47
<b>TOTAL</b>	<b>93,037,297</b>	<b>100.00</b>	<b>130,140</b>	<b>1,422</b>	<b>100.00</b>

- Totals may not add up due to rounding.

**Graph 4.1: National Liquid Fuel Production/Imports in 2007**



**Graph 4.2: Tonnage of Sulphur in Liquid Fuels in 2007**



**Table 4.2A**  
**Fuel Production/Imports and Sulphur Content, Atlantic Region Summary for 2007**

<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 (mg/kg)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	515,257	625	1,511	1.42
Motor Gasoline	NA <sup>1</sup>	49	23	0.11
Aviation Gasoline	0	0	0	0.00
Kerosene/Stove oil	47,559	29	746	0.07
Ultra Low-Sulphur Diesel Fuel	1,861,823	8	5	0.02
Low-Sulphur Diesel Fuel	186,612	51	321	0.12
Diesel Fuel	NA <sup>1</sup>	190	1,517	0.43
Light Fuel Oil	1,268,304	1,724	1,583	3.92
Heavy Fuel Oil	2,261,345	36,652	16,224	83.46
Plant Consumption/Other <sup>3</sup>	352,856	4,596	13,247	10.47
<b>TOTAL</b>	<b>6,493,755<sup>2</sup></b>	<b>43,923</b>	<b>35,177</b>	<b>100</b>

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per 1.
3. "Plant Consumption" in the Atlantic Region consists mostly of pitch, gasoline-like blendstock, intermediate fuel oil, and light/heavy fuel oil. "Other" consists of bunker and bituminous emulsion product (i.e. Orimulsion).

**Table 4.2B**  
**Fuel Production/Imports and Sulphur Content, Québec Region Summary for 2007**

<b>Québec 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 (mg/kg)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	1,825,182	954	646	2.95
Motor Gasoline	14,641,069	200	19	0.62
Aviation Gasoline	NA <sup>1</sup>	0	3	0.00
Kerosene/Stove oil	792,613	3	4	0.01
Ultra Low-Sulphur Diesel Fuel	7,624,819	22	4	0.07
Low-Sulphur Diesel Fuel	21,120	1	60	0.00
Diesel Fuel	NA <sup>1</sup>	0	0	0.00
Light Fuel Oil	979,907	1,104	1,331	3.42
Heavy Fuel Oil	2,802,246	30,030	10,867	93.00
Plant Consumption/Other <sup>3</sup>	NA <sup>1</sup>	0	0	0.00
<b>TOTAL</b>	<b>28,686,757<sup>2</sup></b>	<b>32,314</b>	<b>12,933</b>	<b>100</b>

1. Volume not included to protect confidential data
2. Total volume excludes the volume not included, as per 1.
3. "Plant Consumption" in Quebec consists mostly of heavy fuel oil and unspecified fuel.

**Table 4.2C**  
**Fuel Production/Imports and Sulphur Content, Ontario Region Summary for 2007**

<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 (mg/kg)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	1,230,097	526	527	1.77
Motor Gasoline	10,339,693	136	22	0.46
Aviation Gasoline	0	0	0	0.00
Kerosene/Stove oil	54,270	21	458	0.07
Ultra Low-Sulphur Diesel Fuel	5,569,382	22	5	0.07
Low-Sulphur Diesel Fuel	355,708	102	334	0.34
Diesel Fuel	217,171	369	1,938	1.24
Light Fuel Oil	259,763	135	624	0.46
Heavy Fuel Oil	1,228,198	23,394	19,063	78.72
Plant Consumption/Other <sup>1</sup>	266,307	5,034	18,222	16.94
<b>TOTAL</b>	<b>19,520,589</b>	<b>29,739</b>	<b>41,193</b>	<b>100</b>

1. Plant consumption in Ontario consists mostly of liquefied refinery fuel (LRF) and heavy fuel oil and unspecified fuels.

**Table 4.2D**  
**Fuel Production/Imports and Sulphur Content, West Region Summary for 2007**

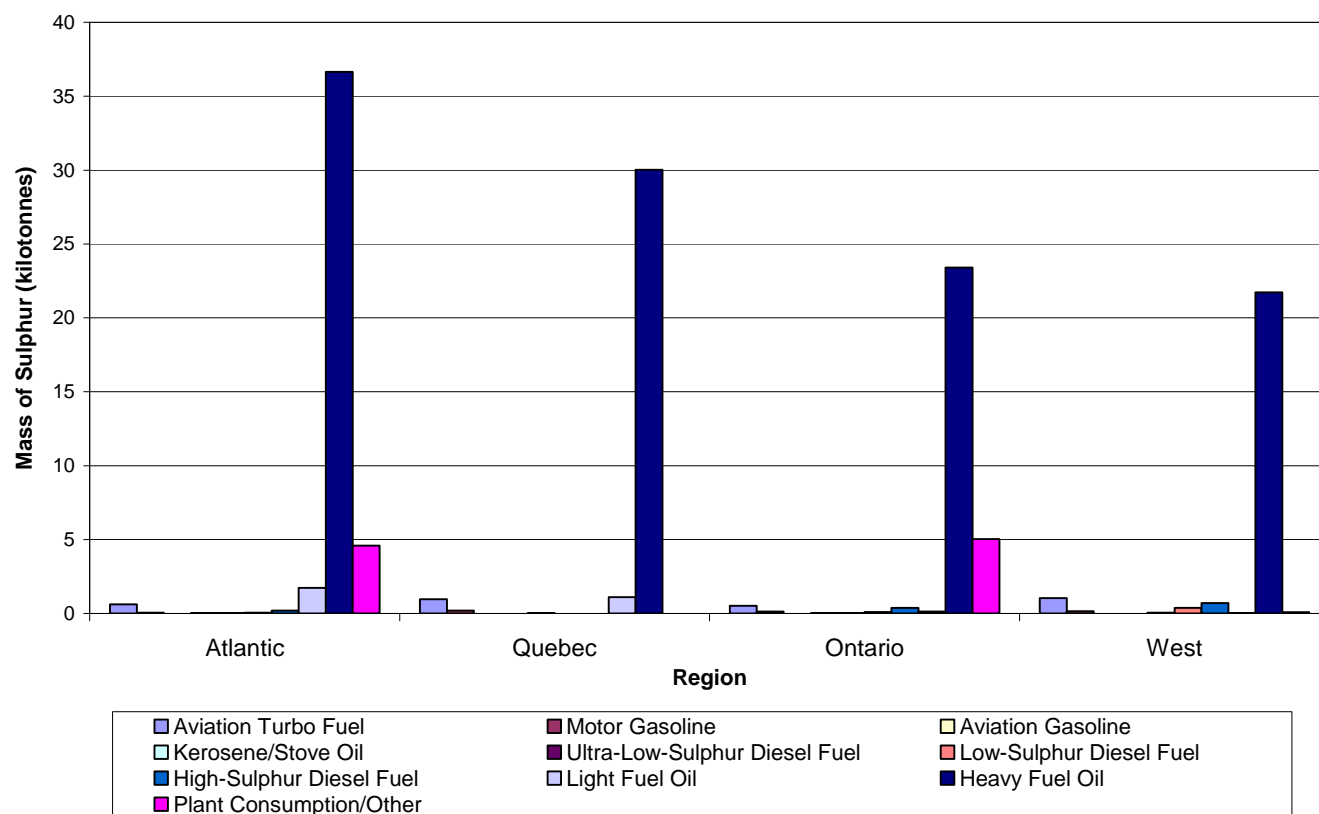
<b>West Region</b>				
<b>Type of Fuel</b>	<b>Fuel Production / Imports (m<sup>3</sup>)</b>	<b>Sulphur Mass (tonnes)</b>	<b>Average Sulphur Content (mg/kg)</b>	<b>Distribution of Sulphur in Products (%)</b>
Aviation Turbo Fuel	3,125,366	1,044	412	4.33
Motor Gasoline	13,542,599	142	14	0.59
Aviation Gasoline	NA <sup>1</sup>	2	47	0.01
Kerosene/Stove oil	NA <sup>1</sup>	0	3	0.00
Ultra Low-Sulphur Diesel Fuel	13,993,846	50	4	0.21
Low-Sulphur Diesel Fuel	2,196,974	378	203	1.57
Diesel Fuel	528,104	695	1,537	2.87
Light Fuel Oil	NA <sup>1</sup>	36	2,839	0.15
Heavy Fuel Oil	1,274,799	21,732	16,996	90.12
Plant Consumption/Other <sup>3</sup>	392,984	86	263	0.36
<b>TOTAL</b>	<b>35,054,672<sup>2</sup></b>	<b>24,164</b>	<b>22,318</b>	<b>100</b>

1. Volume not included to protect confidential data  
2. Total volume excludes the volume not included, as per 1.  
3. Plant consumption in the West Region—i.e. MB, SK, AB, BC, YT, NWT, and NU—consists mostly of diesel fuels and unspecified fuels.

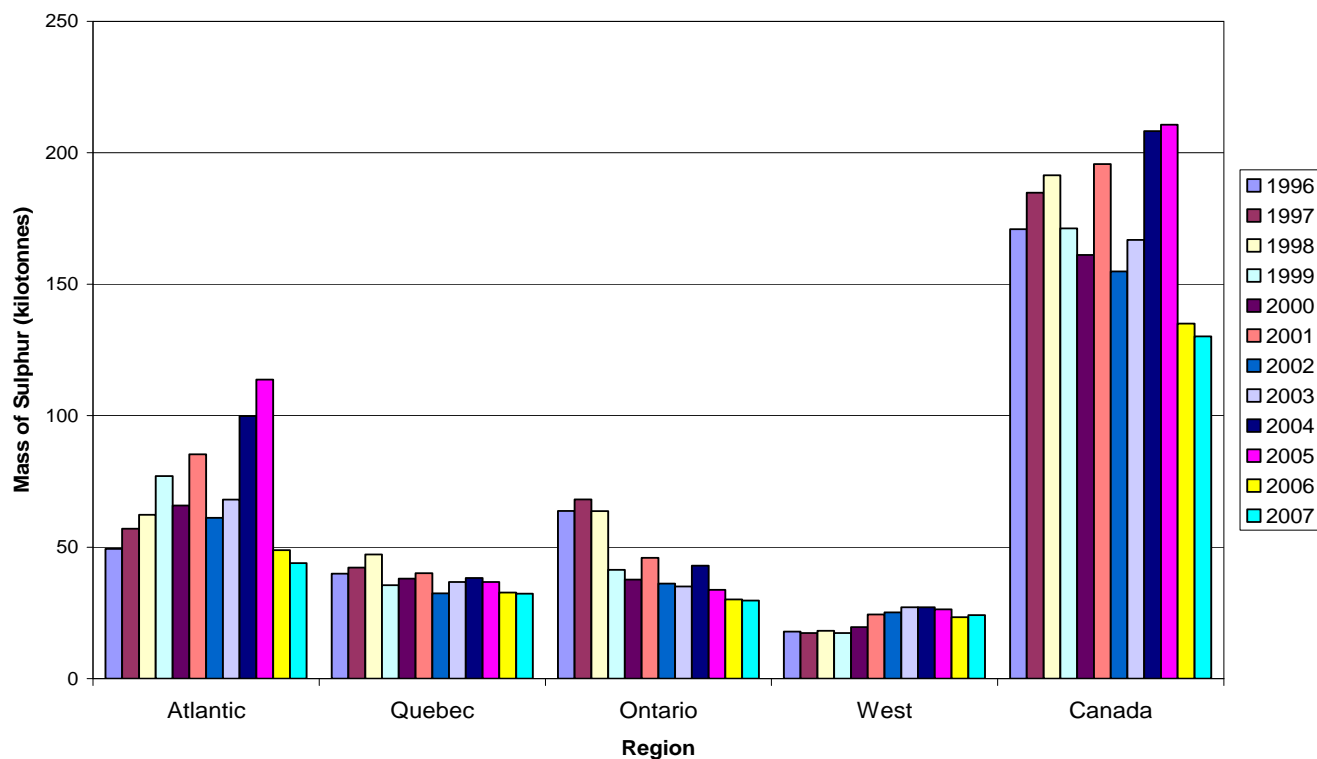
**Table 4.2E**  
**National Volume Weighted Averages of the Density of Fuels**  
**Produced And Imported in 2007 (kg/m<sup>3</sup>)**

Type of Fuel	National Volume Weighted Average Density (kg/m <sup>3</sup> )
Aviation Turbo Fuel	810.5
Motor Gasoline	733.1
Aviation Gasoline	703.5
Kerosene/Stove oil	818.2
Ultra Low-Sulphur Diesel Fuel	837.4
Low-Sulphur Diesel Fuel	846.4
Diesel Fuel	858.1
Light Fuel Oil	847.6
Heavy Fuel Oil	993.8
Plant Consumption/Other	899.3

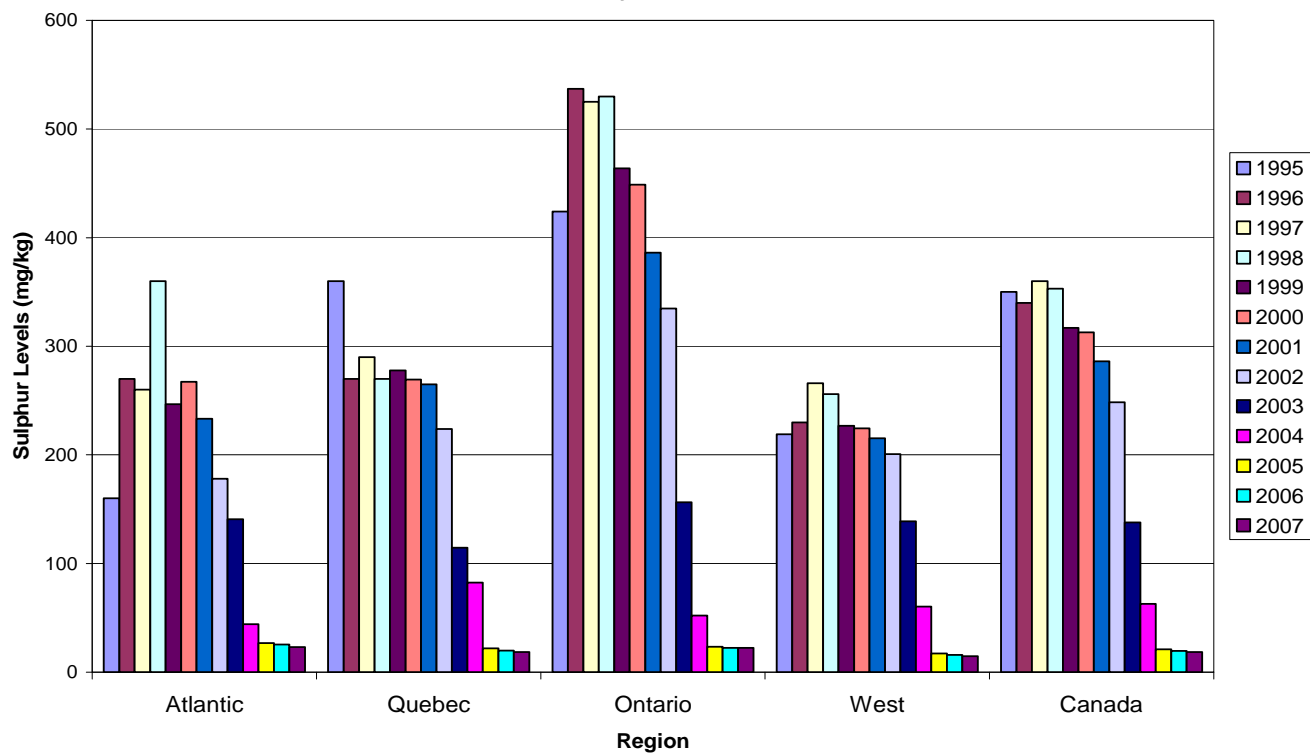
**Graph 4.3: Mass of Sulphur in Liquid Fuels Produced/Imported in 2007**



**Graph 4.4: Sulphur Mass in Liquid Fuels by Region and Nationally, 1996–2007**

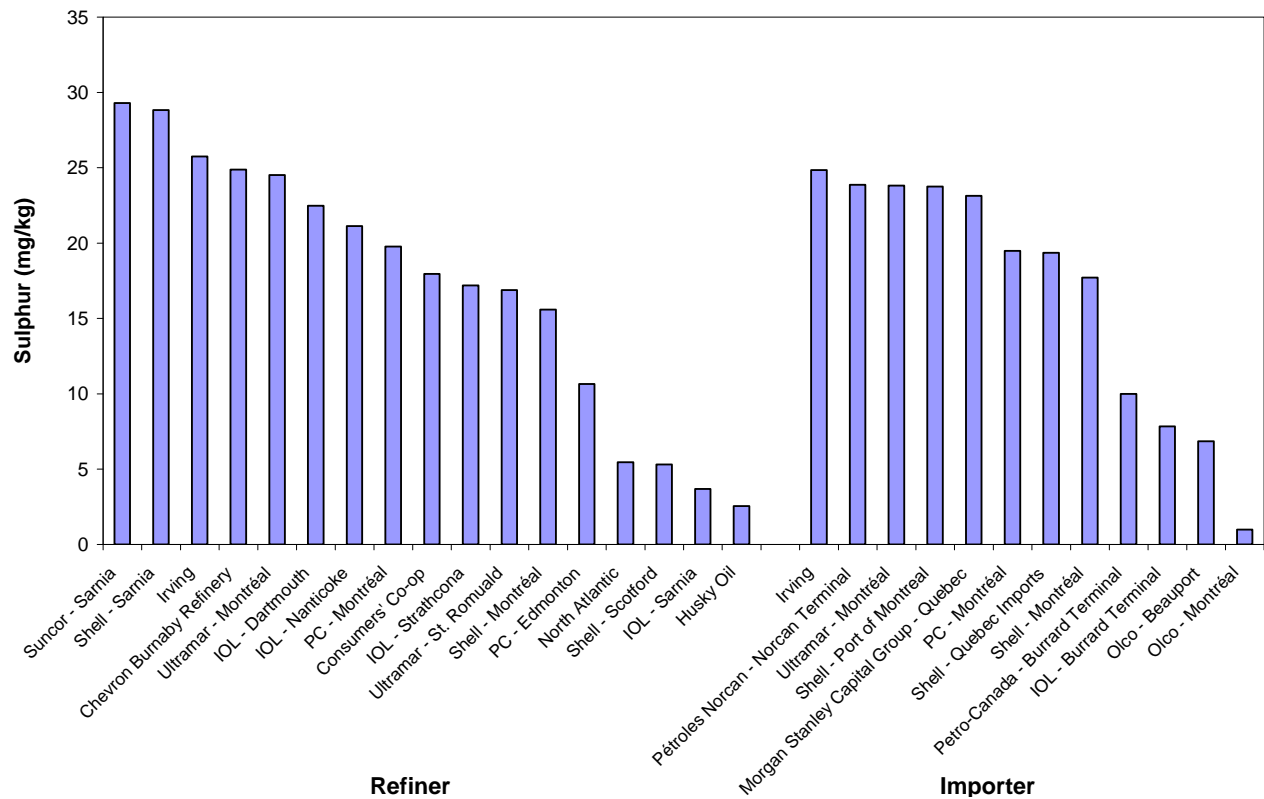


**Graph 4.5: Average Sulphur Levels in Motor/Aviation Gasoline by Region and Nationally, 1995–2007**

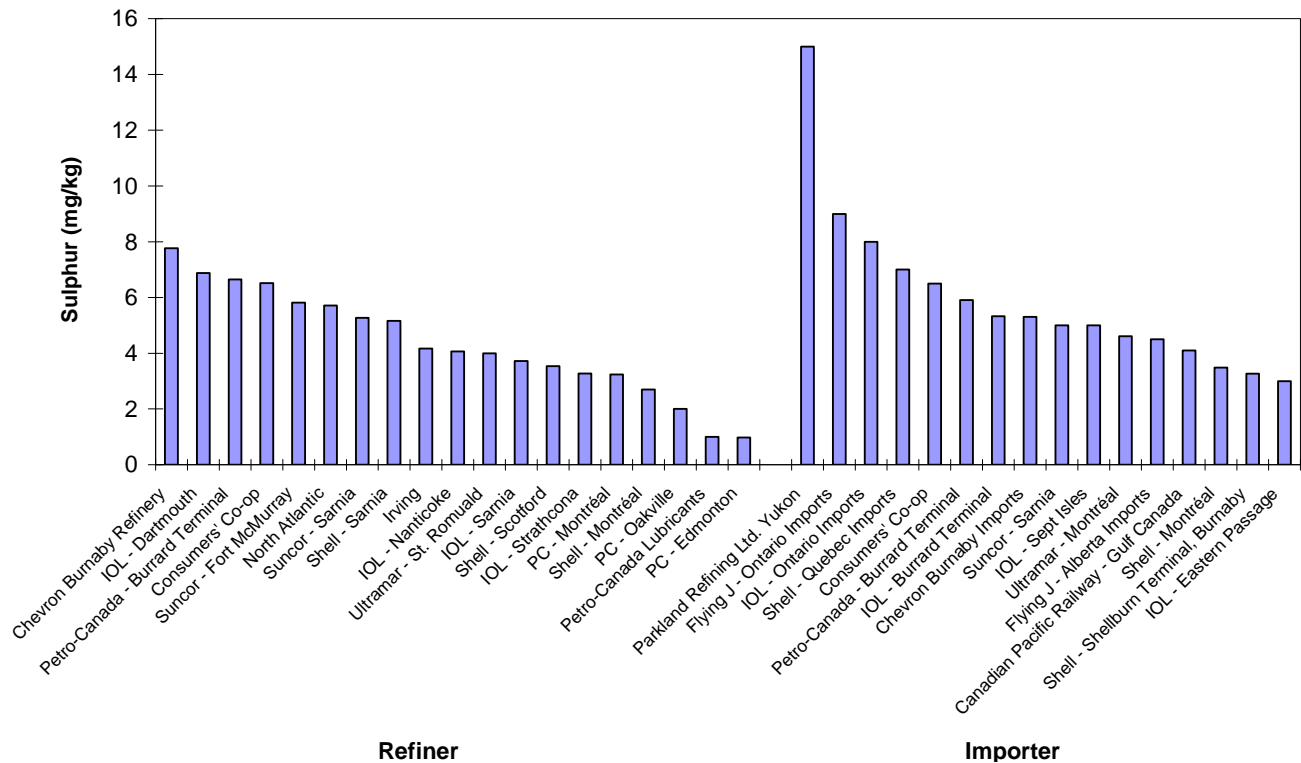




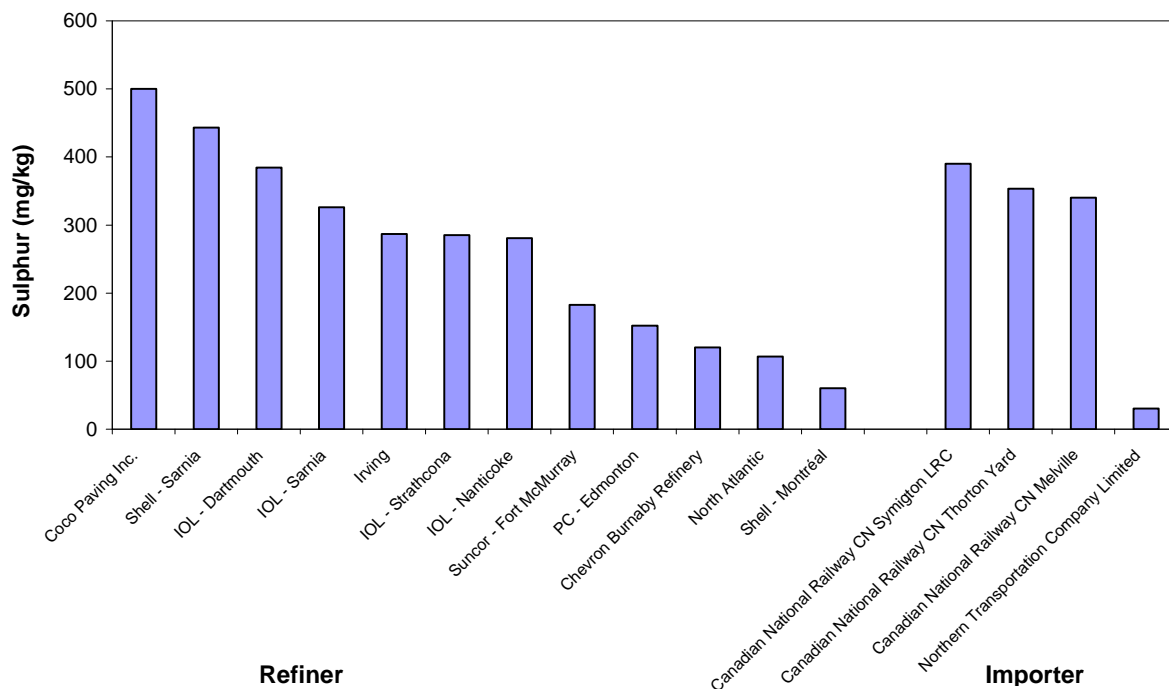
**Graph 4.6: Average Sulphur Levels in Motor Gasoline by Refinery/Importer in 2007**



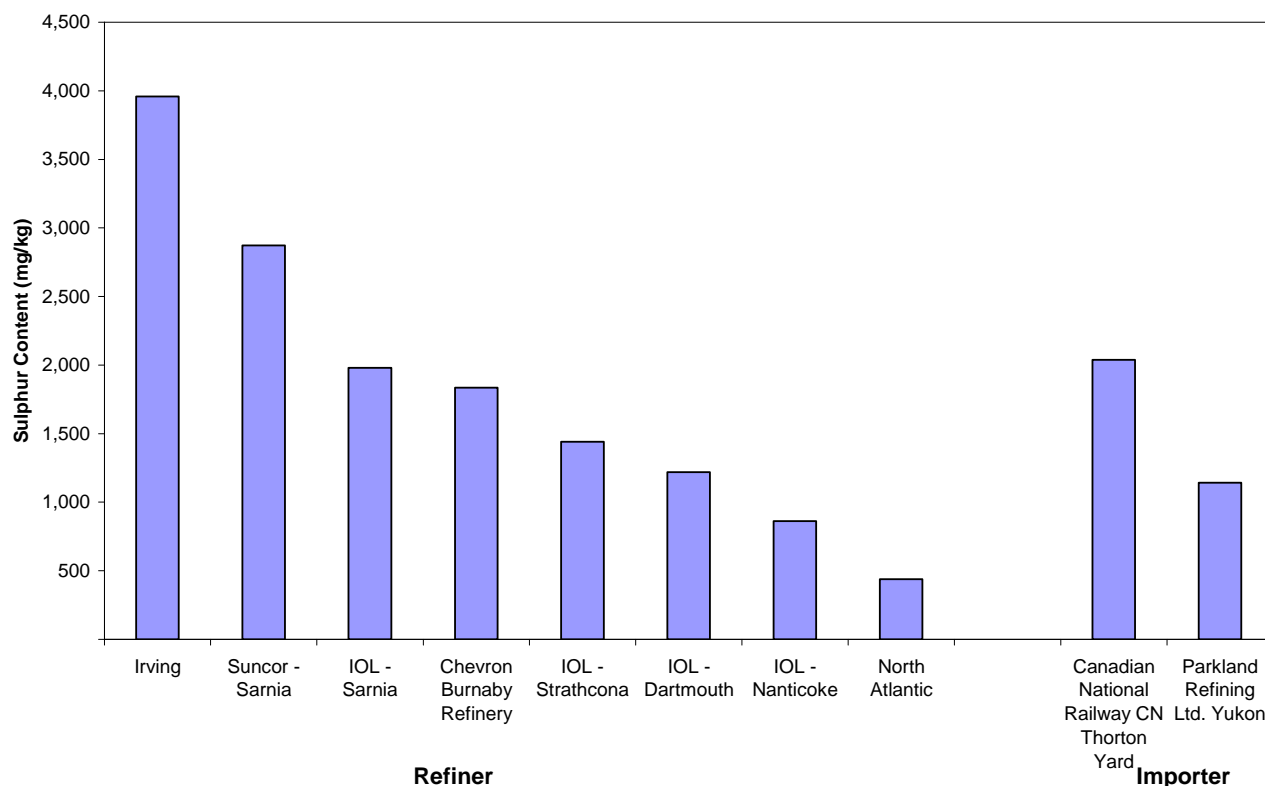
**Graph 4.7: Average Sulphur Levels in Ultra-Low-Sulphur Diesel Fuel by Refinery/Importer in 2007**



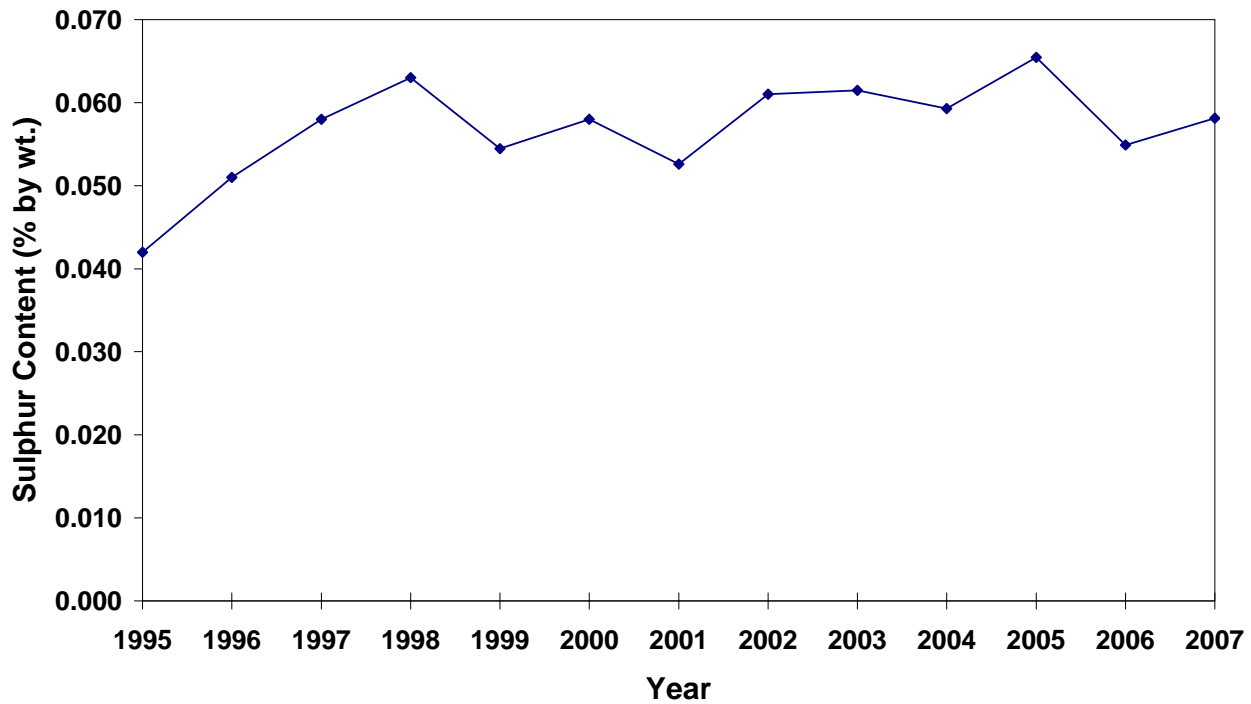
**Graph 4.8: Average Sulphur Levels in Low-Sulphur Diesel Fuel by Refinery/Importer in 2007**



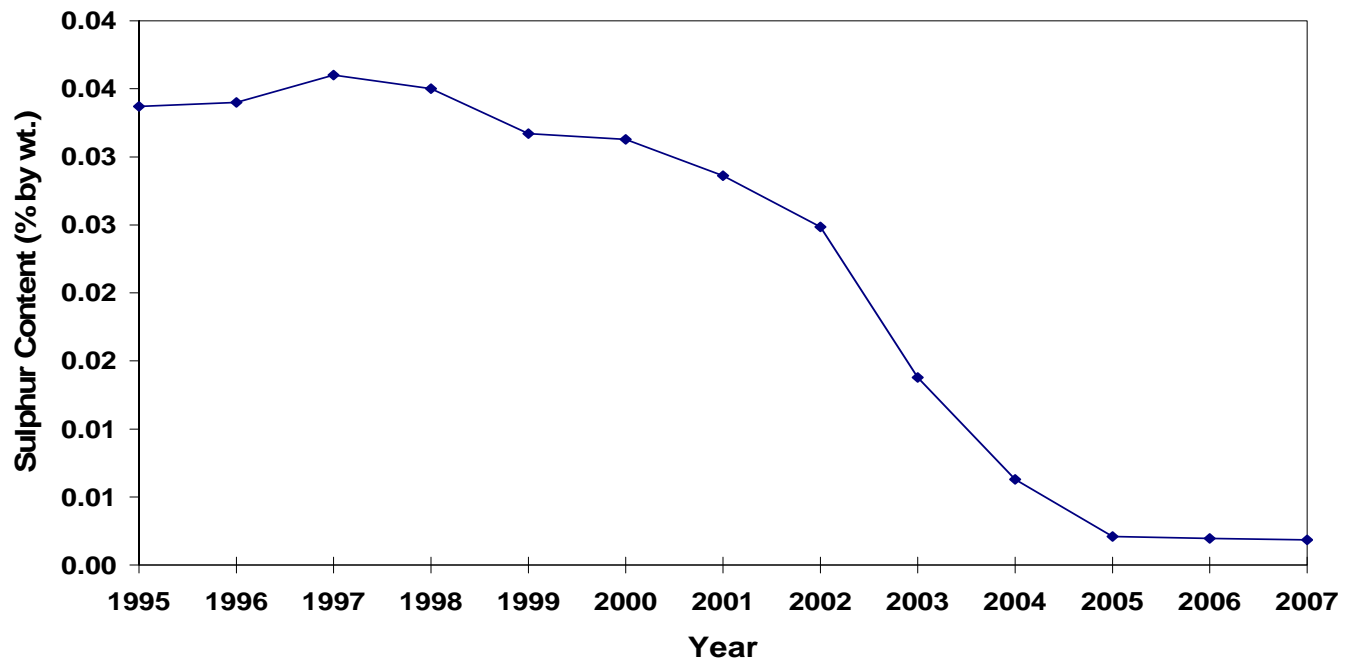
**Graph 4.9: Average Sulphur in High-Sulphur Diesel Fuel by Refinery/Importer in 2007**



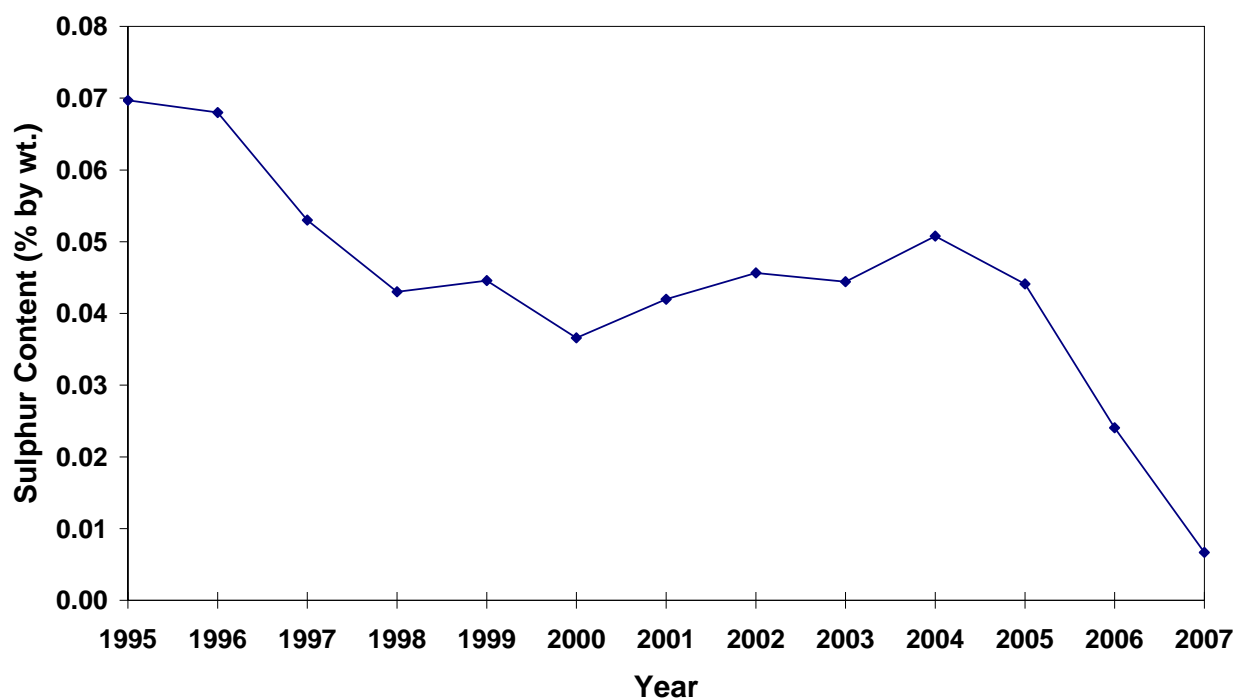
**Graph 4.10: National Trend of Sulphur Content in Aviation Turbo Fuel, 1995-2007**



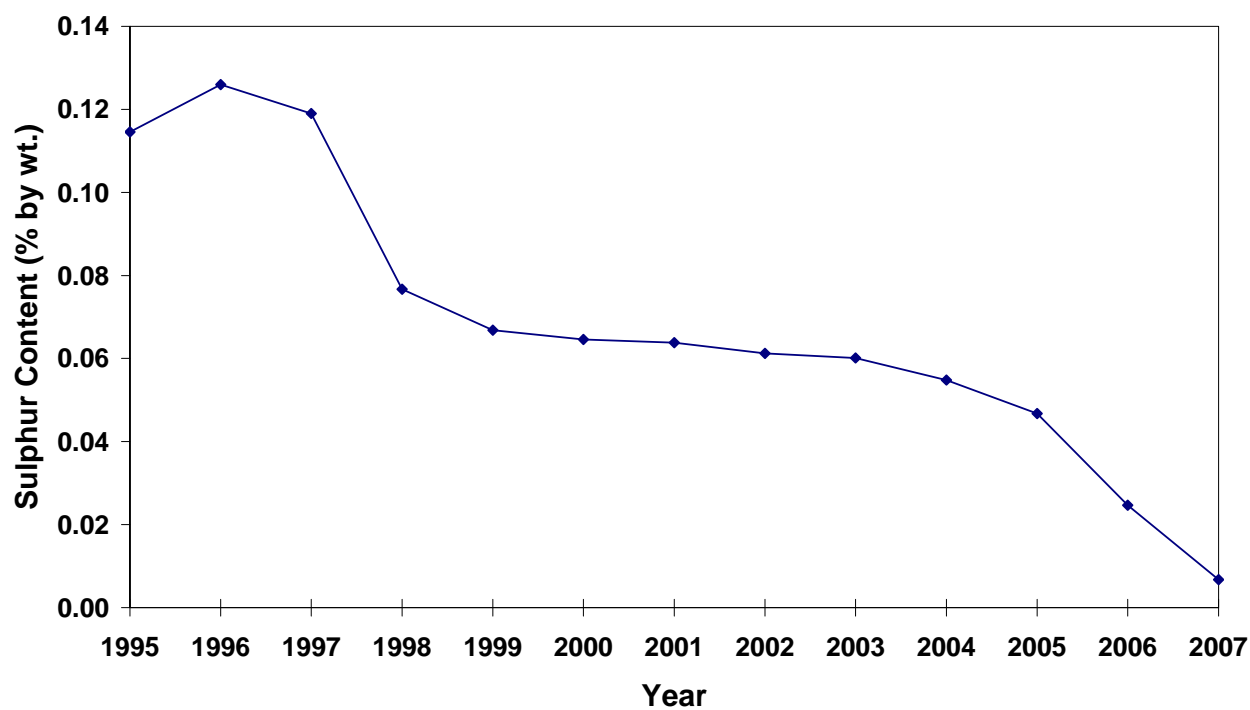
**Graph 4.11: National Trend of Sulphur Content in Motor/Aviation Gasoline, 1995-2007**



**Graph 4.12: National Trend of Sulphur Content in Kerosene/Stove Oil, 1995-2007**

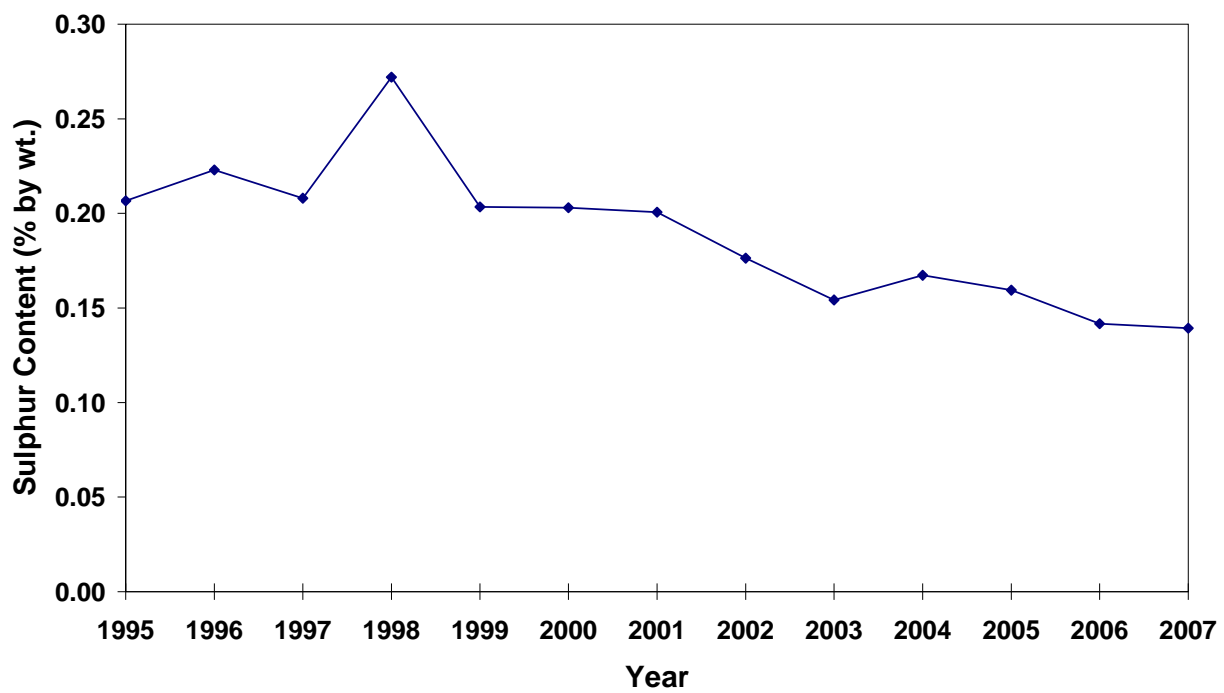


**Graph 4.13: National Trend of Sulphur Content in Diesel Fuel (Total Pool), 1995-2007**

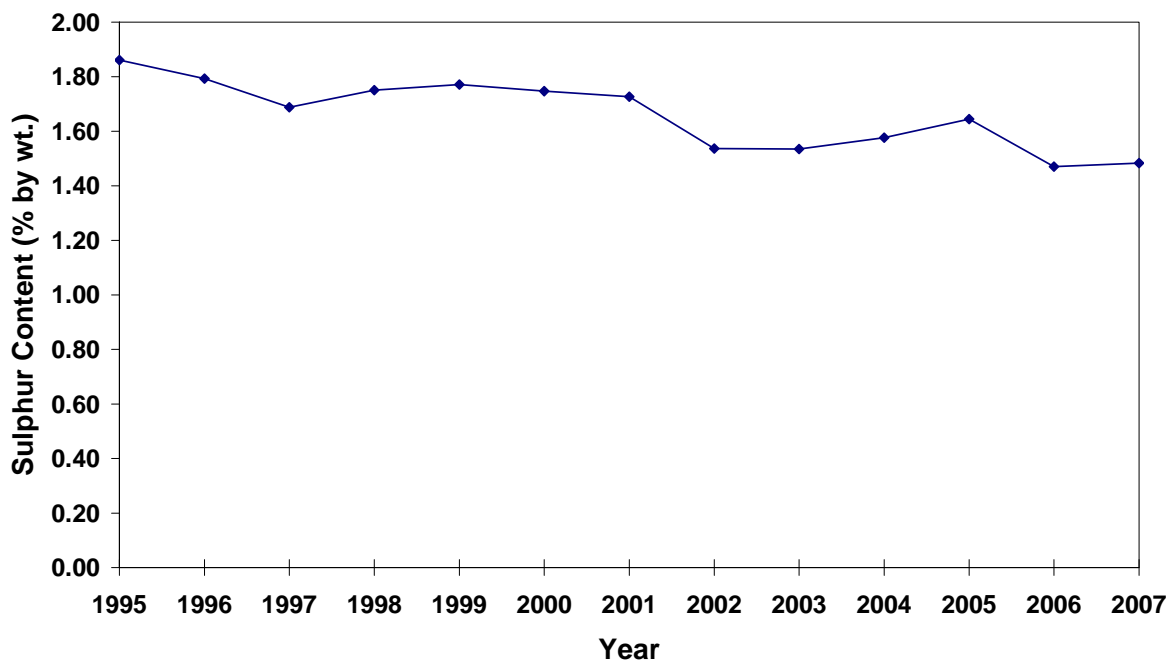


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**Graph 4.14: National Trend of Sulphur Content in Light Fuel Oil,  
1995-2007**



**Graph 4.15: National Trend of Sulphur Content in Heavy Fuel Oil,  
1995-2007**



## **Appendix 1**

### **Web Site References for *Fuels Information Regulations, No. 1* and Other Fuels Regulations**

***Environment Canada's Fossil Fuels – Home Page***

[http://www.ec.gc.ca/cleanair-airpur/Fuels-WS0E66B313-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Fuels-WS0E66B313-1_En.htm)

***Fuels Information Regulations, No. 1***

[http://www.ec.gc.ca/cleanair-airpur/Fuel\\_Information\\_Regulations,\\_No.\\_1-WS0FDA3887-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Fuel_Information_Regulations,_No._1-WS0FDA3887-1_En.htm)

***Sulphur in Gasoline Regulations***

[http://www.ec.gc.ca/cleanair-airpur/Sulphur\\_in\\_Gasoline\\_Regulations-WSD7F604F8-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Sulphur_in_Gasoline_Regulations-WSD7F604F8-1_En.htm)

***Benzene in Gasoline Regulations***

[http://www.ec.gc.ca/cleanair-airpur/Benzene\\_in\\_Gasoline\\_Regulations-WS4664F2AB-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Benzene_in_Gasoline_Regulations-WS4664F2AB-1_En.htm)

***Contaminated Fuels Regulations***

[http://www.ec.gc.ca/cleanair-airpur/Contaminated\\_Fuels\\_Regulations-WS70BC5C6B-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Contaminated_Fuels_Regulations-WS70BC5C6B-1_En.htm)

***Gasoline Regulations***

[http://www.ec.gc.ca/cleanair-airpur/Gasoline\\_Regulations-WS55EC66D9-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Gasoline_Regulations-WS55EC66D9-1_En.htm)

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***Gasoline and Gasoline Blend Dispensing Flow Rate Regulations***

[http://www.ec.gc.ca/cleanair-airpur/Gasoline\\_and\\_Gasoline\\_Blend\\_Dispening\\_Flow\\_Rate\\_Regulations-WS6DCE43CD-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Gasoline_and_Gasoline_Blend_Dispening_Flow_Rate_Regulations-WS6DCE43CD-1_En.htm)

***Sulphur in Diesel Fuel Regulations***

[http://www.ec.gc.ca/cleanair-airpur/Sulphur\\_in\\_Diesel\\_Fuel\\_Regulations-WS5B4D506F-1\\_En.htm](http://www.ec.gc.ca/cleanair-airpur/Sulphur_in_Diesel_Fuel_Regulations-WS5B4D506F-1_En.htm)

## **Appendix 2**

**Sample Forms for Reporting Sulphur Content under the  
*Fuels Information Regulations, No. 1,  
Sulphur in Gasoline Regulations, and  
Sulphur in Diesel Fuel Regulations*  
(2007 Compliance Promotion Package)**



## **FUELS INFORMATION REGULATIONS NO. 1**

### **REPORT ON SULPHUR CONTENT OF LIQUID FUELS (Form 1) FUELS INFORMATION REGULATION No1 (s.4)**

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

This report should be:

- a) submitted for each quarter of the calendar year on or before January 31<sup>st</sup> of each year following the end of the calendar year during which the fuel was produced or imported;
- b) submitted by every person who during the calendar year has produced or imported over 400 cubic meters of liquid fuels for use in Canada;
- c) for the purpose of informing the Minister of Environment;
- d) mailed to the appropriate regional office (please refer to the "Headquarter & Regional Offices" list at section "Contacts List" of the CD for the appropriate address).

**This form is provided for your convenience. Please refer to the *Fuels Information Regulations, No.1* for information on requirements.**

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

COMPANY							
FACILITY NAME:							
FACILITY ADDRESS:							
	NAME OF LIQUID FUEL	VOLUME (m <sup>3</sup> )		DENSITY (kg/m <sup>3</sup> ) or API	SULPHUR CONTENT (WEIGHT %)		
		PRODUCED	IMPORTED		Highest	Lowest	Weighted Average
1.	AVIATION TURBO FUEL    1.1 Jet A 1.2 Jet B						
2.	GASOLINE                      2.1 Lead Free 2.2 Regular 2.3 Premium						
3.	KEROSENE AND STOVE OIL						
4.	DIESEL OIL (by type)						
5.	NUMBER 2 - LIGHT FUEL OIL						
6.	HEAVY FUEL OIL            6.1 NUMBER 4 6.2 NUMBER 5 6.3 NUMBER 6						
7.	Synthetic Crude (sold as fuel)						
8.	A Fuel other than the fuels named in items 1 to 5						
AUTHORIZED COMPANY OFFICIAL: (PLEASE PRINT)		TITLE:		SIGNATURE			
TELEPHONE NUMBER:		FAX NUMBER:		DATE:			

# ***SULPHUR IN DIESEL FUEL REGULATIONS***

## **SCHEDULE 1**

**(Subsection 5(1))**

### **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 m<sup>3</sup>, and sulphur concentration, in mg/kg

	Diesel Fuel Excluding Biodiesel Fuel and Blends of Biodiesel Fuel and Diesel Fuel	Biodiesel Fuel	Blends of Biodiesel Fuel and Diesel Fuel

(a) Diesel fuel with a concentration of sulphur that was less than or equal to 15mg/kg

(i) Volume of diesel fuel			
(ii) Highest sulphur concentration			
(iii) Lowest sulphur concentration			
(iv) Volume-weighted average sulphur concentration			
(v) Method used (for reporting purposes) to measure sulphur concentration			

(b) Diesel fuel with a concentration of sulphur that exceeded 15mg/kg and was less than or equal to 500 mg/kg

(i) Volume of diesel fuel			
(ii) Highest sulphur concentration			
(iii) Lowest sulphur concentration			
(iv) Volume-weighted average sulphur concentration			

	Diesel Fuel Excluding Biodiesel Fuel and Blends of Biodiesel Fuel and Diesel Fuel	Biodiesel Fuel	Blends of Biodiesel Fuel and Diesel Fuel
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(v) Method used (for reporting purposes) to measure sulphur concentration			
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(c) Diesel fuel with a concentration of sulphur exceeding 500 mg/kg

(i) Volume of diesel fuel			
(ii) Highest sulphur concentration			
(iii) Lowest sulphur concentration			
(iv) Volume-weighted average sulphur concentration			
(v) Method used (for reporting purposes) to measure sulphur concentration			

**7. Authorized official**

Name \_\_\_\_\_

Title \_\_\_\_\_

Signature and date \_\_\_\_\_

Telephone number: (\_\_\_\_) \_\_\_\_\_

Fax number: (\_\_\_\_) \_\_\_\_\_

## SULPHUR IN GASOLINE REGULATIONS (SOR/99-236)

### ANNUAL REPORT ON VOLUMES AND SULPHUR LEVEL SULPHUR IN GASOLINE REGULATIONS (s.4 & 6(2))

This report should be:

- a) submitted by each primary supplier that produces or imports gasoline identified as low-sulphur gasoline, California gasoline or gasoline-like blendstock 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 selected 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.
- d) mailed to the appropriate regional office (please refer to the "Headquarter & Regional Offices" list at section "Contacts List" of the CD for the appropriate address).

**This form is provided for your convenience. Please refer to the *Sulphur in Gasoline Regulations* for information on compliance with the requirements for reporting on the sulphur content of liquid fuels.**

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

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

Method selected to meet the sulphur limit: ☐ Pool average ☐ Flat

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

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Type of Gasoline	Annual Volume		Flat Limit	Pool Average	
	PRODUCED(m <sup>3</sup> )	IMPORTED(m <sup>3</sup> )	Maximum Sulphur Concentration in Gasoline (mg/kg)	Maximum Sulphur Concentration in Gasoline (mg/kg)	Volume-Weighted Average (mg/kg)
1. Low Sulphur Gasoline					
2. California Gasoline				NOT REQUIRED	NOT REQUIRED
3. Gasoline-like Blendstock			NOT REQUIRED	NOT REQUIRED	NOT REQUIRED

<b>Authorized Official</b>	<b>Telephone No.</b> (     )     -
<b>Title</b>	<b>Fax No.</b> (     )     -
<b>Signature</b>	<b>Date</b>
<b>Contact Name</b>	<b>Contact Telephone No.</b> (     )     -

## ADDRESSES OF ENVIRONMENT CANADA'S REGIONAL OFFICES

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### **Newfoundland and Labrador, Nova Scotia, New Brunswick and Prince Edward Island**

Director  
Environmental Protection – Atlantic Region  
Environment Canada  
45 Alderney Drive  
16th floor, Queens Square  
Dartmouth, NS, Nova Scotia B2Y 2N6  
**Fax: (902) 426-4352**

### **Quebec**

Director  
Environmental Enforcement Division  
Enforcement Branch  
105, McGill Street 7rd Floor  
Montréal, QC, Québec H2Y 2E7  
**Fax : (514) 496-2087**

### **Ontario**

Director, Environmental Enforcement-Ontario Region  
Environment Canada  
4905 Dufferin Street, Second floor  
Toronto, Ontario, M3H 5T4  
**Fax: (416) 739-4251**

### **Manitoba, Saskatchewan, Alberta, NWT and Nunavut**

Regional Director  
Environmental Enforcement Division  
Enforcement Branch – Prairie & Northern Region  
Environment Canada  
Room 200  
4999 - 98th Avenue NW  
Edmonton, AB, Alberta T6B 2X3  
**Fax : (780) 495-2451**

### **British Columbia and Yukon**

Regional Manager  
Environmental Enforcement Division  
Enforcement Branch-Pacific & Yukon Region  
Environment Canada  
401 Burrard Street – suite 201  
Vancouver, British Columbia V6C 3S5  
**Fax : (604) 666-9059**

## ADDRESS FOR ENVIRONMENT CANADA HEADQUARTERS

### **Fuels Section**

Oil, Gas and Alternative Energy Division  
Environment Canada  
351 St. Joseph Blvd  
Gatineau, QC, K1A 0H3  
**Fax : (819) 953-8903**

## **Appendix 3**

### **Volume-Weighted Annual Sulphur Levels by Refiner/Importer, 1995–2007**

**Appendix 3.1a: Volume Weighted Annual Sulphur Levels in Motor Gasoline 1995 – 2007**

	Facility Name	Location	Sulphur Levels (mg/kg)												
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	215	273	294	246	199	174	171	213	118	132	18	24	25
	Consumers' Co-operative Refineries Limited	Regina, SK	97	179	103	148	187	242	197	178	163	68	20	18	18
	Husky Oil Operations Ltd.	Prince George, BC	183	261	225	282	170	248	239	242	143	108	33	8	3
	Imperial Oil	Dartmouth, NS	365	419	374	491	329	382	356	265	188	28	25	26	22
	Imperial Oil	Edmonton, AB	239	243	346	297	272	252	302	268	165	30	22	19	17
	Imperial Oil	Nanticoke, ON	340	506	530	529	450	456	376	366	208	21	29	25	21
	Imperial Oil	Sarnia, ON	728	787	712	792	694	693	596	432	191	15	4	5	4
	Irving Oil Limited	Saint-John, NB	71	35	43	129	96	85	48	50	66	65	29	24	26
	North Atlantic Refining Limited	Come-by-Chance, NL	38	75	118	76	55	47	49	58	29	25	30	9	5
	Parkland Refining Limited	Bowden, AB	-	1	1	4	4	8	4	-	-	-	-	-	-
	Petro-Canada	Edmonton, AB	360	380	394	377	311	311	250	202	168	81	11	13	11
	Petro-Canada	Montréal, QC	472	356	387	316	367	292	320	275	218	25	21	20	20
	Petro-Canada	Oakville, ON	528	489	519	514	523	479	396	305	133	138	24	-	-
	Shell Canada Products	Corunna, ON	553	579	582	567	453	466	462	399	53	58	28	24	29
	Shell Canada Products	Fort Saskatchewan, AB	50	50	50	50	50	50	49	50	7	10	12	5	5
	Shell Canada Products	Montréal, QC	392	319	333	312	269	318	280	231	38	33	19	15	16
	Suncor Energy Products Incorporated	Sarnia, ON	368	276	298	301	209	192	180	196	157	47	21	28	29
	Ultramar Limitée	Lévis // St-Romuald, QC	219	174	186	171	173	218	212	188	105	152	18	18	17
	Ultramar Limitée	Montréal, QC	-	-	-	-	-	-	-	155	95	75	27	29	25
<b>Blender</b>	Robbins Feed and Fuel	Allanburg, ON	-	-	-	137	271	239	307	222	120	104	33	-	-
<b>Importer</b>	BP West Coast Products, LLC	Blaine, WA	-	-	-	70	103	105	110	100	-	-	-	-	-
	Delta Western Fuel (Totem Oil)	Whitehorse, YT	-	-	-	610	73	236	-	-	-	-	-	-	-
	Ford Motor Company of Canada, Limited	Windsor, ON	-	-	-	-	-	28	22	28	15	-	-	-	-
	Husky Oil Operations Ltd.	Prince George, BC	-	-	-	80	-	-	-	-	-	-	-	-	-
	Imperial Oil	Burrard Terminal, BC	-	-	-	-	-	-	-	-	-	74	11	15	8
	Imperial Oil	Burnaby, BC	-	-	-	210	-	-	63	63	-	-	-	-	-
	Imperial Oil	Montréal, QC	-	-	-	-	340	-	-	-	-	-	-	-	-
	Imperial Oil	Point Tupper, NS	-	-	-	-	-	-	-	-	-	-	74	-	-
	Irving Oil Limited	Saint-John, NB	-	-	-	-	-	-	-	-	-	-	-	25	25
	Mackenzie Petroleum Limited	Dawson City, YT	-	-	-	170	301	280	234	234	-	-	-	-	-

		Sulphur Levels (mg/kg)												
Facility Name	Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Morgan Stanley Capital Group	Purchase, NY	-	-	-	-	-	-	-	-	-	-	-	-	23
Murphy Oil USA	Superior, WI	-	-	-	540	430	-	-	-	-	-	-	-	-
Neste Petroleum	Beauport, QC	-	-	-	-	-	-	386	400	-	103	-	-	-
Neste Petroleum	Montréal, QC	-	-	-	-	-	-	361	222	-	103	-	-	-
Northern Transportation	Iqaluit, NU	-	-	-	100	310	107	743	43	-	-	-	-	-
Olco Petroleum Group	Beauport, QC	-	-	-	-	-	-	-	-	-	-	421	26	7
Olco Petroleum Group	Hamilton	-	-	-	410	540	394	317	307	-	-	-	-	-
Olco Petroleum Group	Montréal, QC	-	-	-	-	-	-	-	-	-	20	-	-	1
Olco Petroleum Group	Québec	-	-	-	457	511	299	-	-	-	-	-	-	-
PaceSetter Enterprises	Whitehorse, YT	-	-	-	-	246	220	-	-	-	-	-	-	-
Parkland Refining Limited	Bowden, AB	-	-	-	110	18	18	82	265	-	-	-	-	-
Petro-Canada	Montréal, QC	-	-	-	340	360	-	420	315	230	18	20	19	19
Petro-Canada	Oakville, ON	-	-	-	610	520	490	368	-	-	75	-	-	-
Petro-Canada	Port Moody, BC	-	-	-	210	321	-	-	-	49	114	2	24	10
Pétroles Norcan	Montréal, QC	-	-	-	470	560	273	243	196	100	145	29	30	24
Robbins Feed and Fuel	Allanburg, ON	-	-	-	140	270	-	-	-	-	-	-	-	-
Shell Canada Products	Montréal, QC	392	313	333	312	269	318	280	231	63	55	26	-	18
Shell Canada Products	Port of Montreal, QC	-	-	-	-	-	-	-	-	-	-	-	-	24
Shell Trading Canada	Quebec Imports, QC	-	-	-	-	-	-	-	-	-	-	-	-	19
TransCanada Energy	Calgary, AB	-	-	-	100	500	-	-	-	-	-	-	-	-
Ultramar Limitée	Holyrood, NFL	-	-	-	-	-	-	-	-	180	96	22	-	-
Ultramar Limitée	Lévis // St-Romuald, QC	-	-	-	120	300	270	262	140	77	183	19	20	-
Ultramar Limitée	Montréal, QC	-	-	-	-	-	-	-	170	88	77	28	28	24
National Average		345	340	360	350	320	310	290	246	138	63	21	20	18



### Appendix 3.1b: Volume Weighted Quarterly Sulphur Levels in Motor Gasoline for 2007

	Facility Name	Location	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	30	24	19	28	25
	Consumers' Co-operative Refineries Limited	Regina, SK	18	18	18	17	18
	Husky Oil Operations Ltd.	Prince George, BC	0	0	10	0	3
	Imperial Oil	Dartmouth, NS	18	28	22	21	22
	Imperial Oil	Nanticoke, ON	24	26	29	17	21
	Imperial Oil	Sarnia, ON	5	5	2	3	4
	Imperial Oil	Edmonton, AB	19	14	19	17	17
	Irving Oil Limited	Saint-John, NB	26	23	24	31	26
	North Atlantic Refining Limited	Come-by-Chance, NL	7	4	7	4	5
	Petro-Canada	Edmonton, AB	8	4	15	15	11
	Petro-Canada	Montréal, QC	21	22	18	18	20
	Shell Canada Products	Montréal, QC	18	14	14	17	16
	Shell Canada Products	Corunna, ON	26	21	31	37	29
	Shell Canada Products	Fort Saskatchewan, AB	7	6	5	3	5
	Suncor Energy Products Incorporated	Sarnia, ON	35	20	33	30	29
	Ultramar Limitée	Montréal, QC	28	30	20	23	25
	Ultramar Limitée	Lévis // St-Romuald, QC	13	19	16	19	17
<b>Importer</b>	Imperial Oil	Burnaby, BC	3	10	8	0	8
	Irving Oil Limited	Saint-John, NB	26	23	24	31	25
	Morgan Stanley Capital Group	Purchase, NY	0	20	27	6	23
	Olco Petroleum Group	Beauport, QC	27	2	0	0	7
	Olco Petroleum Group	Montréal, QC	0	1	0	0	1
	Petro-Canada	Montréal, QC	21	22	18	18	19
	Petro-Canada	Port Moody, BC	0	0	10	0	10
	Pétroles Norcan	Montréal, QC	30	13	32	18	24
	Shell Canada Products	Montréal, QC	18	14	14	17	18
	Shell Canada Products	Port of Montreal, QC	32	14	0	0	24
	Shell Trading Canada	Quebec Imports, QC	0	0	19	20	19
	Ultramar Limitée	Montréal, QC	28	30	20	23	24
<b>National Average</b>			19	18	20	17	18

**Appendix 3.2a: Volume Weighted Annual Sulphur Levels in Ultra Low-Sulphur Diesel 2006 – 2007 <sup>1</sup>**

	Facility Name	Location	Sulphur Levels (mg/kg)	
			2006	2007
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	9	8
	Consumers' Co-operative Refineries Limited	Regina, SK	6	7
	Imperial Oil	Dartmouth, NS	7	7
	Imperial Oil	Edmonton, AB	4	3
	Imperial Oil	Nanticoke, ON	4	4
	Imperial Oil	Sarnia, ON	4	4
	Irving Oil Limited	Saint-John, NB	4	4
	North Atlantic Refining Limited	Come-by-Chance, NL	5	6
	Petro-Canada	Edmonton, AB	2	1
	Petro-Canada	Montréal, QC	4	3
	Petro-Canada	Oakville, ON	-	2
	Petro-Canada	Port Moody, BC	6	7
	Petro-Canada Lubricants	Mississauga, ON	1	1
	Shell Canada Products	Corunna, ON	4	5
	Shell Canada Products	Fort Saskatchewan, AB	3	4
	Shell Canada Products	Montréal, QC	5	3
	Suncor Energy Incorporated	Fort McMurray, AB	6	6
	Suncor Energy Products Incorporated	Sarnia, ON	5	5
	Ultramar Limitée	Lévis // St-Romuald, QC	3	4
<b>Importer</b>	Canadian Pacific Railway	Calgary, AB	-	4
	Chevron Canada Limited	Burnaby, BC	7	5
	Flying J Inc	Calgary, AB	-	5
	Flying J Inc	London, ON	-	9
	Imperial Oil	Burnaby, BC	6	5
	Imperial Oil	Halifax, NS	5	3
	Imperial Oil	Ontario Imports, ON	-	8
	Imperial Oil	Sept Isles, QC	3	5
	Parkland Refining Limited	Bowden, AB	10	15
	Petro-Canada	Port Moody, BC	4	6
	Pétroles Norcan	Montréal, QC	7	-
	Shell Canada Products	Burnaby, BC	7	3
	Shell Canada Products	Montréal, QC	5	3
	Shell Trading Canada	Quebec Imports, QC	-	7
	Suncor Energy Products Incorporated	Sarnia, ON	4	5
	Ultramar Limitée	Lévis // St-Romuald, QC	2	-
	Ultramar Limitée	Montréal, QC	5	5
<b>National Average</b>			4	4

<sup>1</sup> No data for 1995-2005 as 15 mg/kg Sulphur limit for Ultra-Low Sulphur Diesel came into effect from 2006 (No Ultra-Low Sulphur Diesel data collected from 1999-2005)

### Appendix 3.2b: Volume Weighted Quarterly Sulphur Levels in Ultra Low-Sulphur Diesel for 2007

	Facility Name	Location	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	8	7	8	8	8
	Consumers' Co-operative Refineries Limited	Regina, SK	6	6	7	7	7
	Imperial Oil	Dartmouth, NS	7	6	6	8	7
	Imperial Oil	Nanticoke, ON	3	0	0	0	4
	Imperial Oil	Sarnia, ON	4	4	3	4	4
	Imperial Oil	Edmonton, AB	3	3	4	3	3
	Irving Oil Limited	Saint-John, NB	2	5	5	4	4
	North Atlantic Refining Limited	Come-by-Chance, NL	3	6	7	4	6
	Petro-Canada	Edmonton, AB	1	2	0	1	1
	Petro-Canada	Montréal, QC	3	3	4	3	3
	Petro-Canada	Oakville, ON	2	0	0	0	2
	Petro-Canada Lubricants	Mississauga, ON	1	1	1	1	1
	Shell Canada Products	Montréal, QC	3	2	2	4	3
	Shell Canada Products	Corunna, ON	5	5	6	5	5
	Shell Canada Products	Fort Saskatchewan, AB	4	4	4	2	4
	Suncor Energy Incorporated	Fort McMurray, AB	5	8	6	5	6
	Suncor Energy Products Incorporated	Sarnia, ON	5	6	5	5	5
	Ultramar Limitée	Lévis // St-Romuald, QC	4	4	4	4	4
<b>Importer</b>	Canadian Pacific Railway	Calgary, AB	0	4	0	4	4
	Chevron Canada Limited	Burnaby, BC	6	0	7	4	5
	Flying J Inc	Calgary, AB	0	0	0	5	5
	Flying J Inc	London, ON	0	0	0	9	9
	Imperial Oil	Burnaby, BC	0	5	6	4	5
	Imperial Oil	Halifax, NS	3	0	0	0	3
	Imperial Oil	Ontario Imports, ON	8	0	0	0	8
	Imperial Oil	Sept Isles, QC	0	0	0	5	5
	Parkland Refining Limited	Bowden, AB	0	0	0	15	15
	Petro-Canada	Port Moody, BC	5	5	7	7	6
	Shell Canada Products	Montréal, QC	3	2	2	4	3
	Shell Trading Canada	Quebec Imports, QC	0	0	0	7	7
	Shell Canada Products	Burnaby, BC	4	4	0	3	3
	Suncor Energy Products Incorporated	Sarnia, ON	5	6	5	5	5
	Ultramar Limitée	Montréal, QC	4	0	0	5	5
<b>National Average</b>			4	4	4	4	4

### Appendix 3.3a: Volume Weighted Annual Sulphur Levels in Low Sulphur Diesel 1995 – 2007

	Facility Name	Location	Sulphur Levels (mg/kg)												
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	350	390	380	400	400	400	389	490	397	355	308	238	120
	Coco Paving Inc.	Windsor, ON	-	-	-	-	-	-	-	-	-	-	-	-	500
	Consumers' Co-operative Refineries Limited	Regina, SK	200	270	250	230	220	190	211	211	189	153	113	32	-
	Husky Oil Operations Ltd.	Prince George, BC	140	200	200	210	190	190	188	165	161	183	149	81	-
	Imperial Oil	Calgary, AB	-	-	-	-	-	-	-	-	-	320	-	-	-
	Imperial Oil	Dartmouth, NS	340	360	390	400	330	370	402	397	400	363	341	376	384
	Imperial Oil	Edmonton, AB	290	400	410	380	430	400	420	409	400	405	383	361	285
	Imperial Oil	Nanticoke, ON	-	-	160	290	280	310	356	322	286	283	310	284	281
	Imperial Oil	Sarnia, ON	-	-	420	290	410	350	349	371	342	292	328	329	326
	Irving Oil Limited	Saint-John, NB	400	400	440	450	440	430	433	432	420	391	382	168	287
	Newalta	Vancouver, BC	-	-	-	-	-	-	-	-	-	209	120	142	-
	North Atlantic Refining Limited	Come-by-Chance, NL	-	-	490	130	330	260	148	163	188	180	184	263	107
	Petro-Canada	Edmonton, AB	190	220	210	230	240	280	283	256	283	240	170	124	152
	Petro-Canada	Montréal, QC	340	420	330	400	400	430	451	422	400	338	327	225	-
	Petro-Canada	Oakville, ON	-	-	170	320	300	300	278	222	245	294	350	-	-
	Petro-Canada	Port Moody, BC	-	-	-	-	-	-	-	-	-	13	71	221	-
	Petro-Canada Lubricants	Mississauga, ON	10	20	20	20	20	20	20	20	85	1	1	-	-
	Shell Canada Products	Corunna, ON	330	340	360	360	370	390	392	400	391	389	377	341	443
	Shell Canada Products	Fort Saskatchewan, AB	50	80	100	210	140	150	196	129	129	111	124	87	-
	Shell Canada Products	Montréal, QC	390	370	210	280	360	350	378	344	365	327	255	98	60
	Suncor Energy Incorporated	Fort McMurray, AB	70	90	140	160	200	250	225	225	225	204	225	214	183
	Suncor Energy Products Incorporated	Sarnia, ON	340	300	370	460	450	440	437	425	419	399	410	401	-
	Ultramar Limitée	Lévis // St-Romuald, QC	450	380	400	410	430	420	420	424	412	418	379	336	-
<b>Blender</b>	Robbins Feed and Fuel	Allanburg, ON	-	-	-	-	-	410	289	-	-	-	-	-	-
<b>Importer</b>	BP West Coast Products, LLC	Blaine, WA	-	-	-	380	380	360	339	400	-	-	-	-	-
	Canadian National Railway	Melville, SK	-	-	-	-	-	-	-	-	-	-	-	-	340

			Sulphur Levels (mg/kg)												
Facility Name	Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Canadian National Railway	Surrey, BC	-	-	-	-	-	-	-	-	-	-	-	-	353	
Canadian National Railway	Winnipeg, MB	-	-	-	-	-	-	-	-	-	-	-	-	390	
Canadian Pacific Railway	Calgary, AB	-	-	-	-	-	-	-	-	-	-	470	-	-	
Chevron Canada Limited	Burnaby, BC	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chevron Canada Limited	Burnaby, BC	-	-	-	-	-	-	-	-	-	-	-	131	-	
Coco Paving Inc.	Windsor, ON	-	-	-	-	-	-	-	-	-	-	-	-	-	
Daigle Oil Limited	Edmundston, NB	-	-	-	-	-	500	500	-	160	-	-	20	-	
Delta Western Fuel (Totem Oil)	Whitehorse, YT	-	-	-	160	400	430	-	-	-	-	-	-	-	
Husky Oil Operations Ltd.	Prince George, BC	-	-	-	380	-	-	-	-	-	-	-	-	-	
Imperial Oil	Burnaby, BC	-	-	-	230	-	360	345	-	424	345	341	148	-	
Imperial Oil	Dartmouth, NS	-	-	-	-	-	-	-	-	-	-	-	303	-	
Mackenzie Petroleum Limited	Dawson City, YT	-	-	-	300	400	450	400	398	385	207	310	405	-	
Marine Petrobulk Limited.	Vancouver, BC	-	-	-	-	-	-	-	200	272	300	-	-	-	
Murphy Oil USA	Superior, WI	-	-	-	270	270	-	-	-	-	-	-	-	-	
Northern Transportation	Hay River, NWT	-	-	-	-	-	-	-	-	-	-	-	-	30	
Northern Transportation	Iqaluit, NU	-	-	-	20	210	270	271	255	-	-	-	51	-	
Olco Petroleum Group	Beauport, QC	-	-	-	400	310	-	-	-	-	-	-	-	-	
Olco Petroleum Group	Montréal, QC	-	-	-	-	310	-	-	-	-	-	-	-	-	
Parkland Refining Limited	Bowden, AB	-	-	-	400	500	480	500	448	290	378	450	450	-	
Petro-Canada	Montréal, QC	-	-	-	390	400	400	473	500	-	333	-	-	-	
Petro-Canada	Oakville, ON	-	-	-	310	-	-	-	-	-	-	-	-	-	
Petro-Canada	Port Moody, BC	-	-	-	-	-	360	251	-	375	348	267	57	-	
Pétroles Norcan	Montréal, QC	-	-	-	450	450	-	-	-	-	462	-	-	-	
Shell Canada Products	Burnaby, BC	-	-	-	-	-	-	-	-	-	379	388	397	-	
Shell Canada Products	Montréal, QC	-	-	-	-	-	-	-	-	-	365	-	-	-	
Suncor Energy Products Incorporated	Sarnia, ON	-	-	-	-	-	-	430	-	-	410	430	390	-	
Ultramar Limitée	Holyrood, NFL	-	-	-	-	-	-	-	-	400	258	237	-	-	
Ultramar Limitée	Lévis // St-Romuald, QC	-	-	-	410	430	410	412	-	-	-	365	-	-	
Ultramar Limitée	Montréal, QC	-	-	-	-	-	-	-	440	-	254	242	136	-	
United Refining Company	Warren, PN	-	-	-	-	-	-	282	286	296	-	-	-	-	
National Average		210	260	270	310	320	330	340	324	317	295	270	213	226	

### Appendix 3.3b: Volume Weighted Quarterly Sulphur Levels in Low-Sulphur Diesel for 2007

	Facility Name	Location	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	0	0	120	0	120
	Coco Paving Inc.	Windsor, ON	0	500	500	0	500
	Imperial Oil	Dartmouth, NS	0	435	394	359	384
	Imperial Oil	Nanticoke, ON	0	0	0	0	281
	Imperial Oil	Sarnia, ON	0	391	323	300	326
	Imperial Oil	Edmonton, AB	267	331	367	200	285
	Irving Oil Limited	Saint-John, NB	0	431	236	37	287
	North Atlantic Refining Limited	Come-by-Chance, NL	0	0	0	107	107
	Petro-Canada	Edmonton, AB	0	152	0	0	152
	Shell Canada Products	Montréal, QC	54	68	0	0	60
	Shell Canada Products	Corunna, ON	0	0	459	410	443
	Suncor Energy Incorporated	Fort McMurray, AB	149	196	214	190	183
<b>Importer</b>	Canadian National Railway	Melville, SK	0	0	0	340	340
	Canadian National Railway	Winnipeg, MB	0	0	0	390	390
	Canadian National Railway	Surrey, BC	0	390	360	340	353
	Northern Transportation	Hay River, NWT	46	0	28	0	30
<b>National Average</b>			182	242	267	205	226

### Appendix 3.4a: Volume Weighted Annual Sulphur Levels in High-Sulphur Diesel 1995 - 2007

	Facility Name	Location	Sulphur Levels (mg/kg)												
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	-	-	-	-	-	3,110	3,290	3,648	3,518	1,885	3,351	3,315	1,835
	Husky Oil Operations Ltd.	Prince George, BC	570	580	-	-	-	-	-	-	-	-	-	580	-
	Imperial Oil	Dartmouth, NS	2,010	1,460	1,840	890	510	740	989	656	944	887	965	1,431	1,220
	Imperial Oil	Edmonton, AB	1,820	2,100	1,980	2,100	2,140	2,170	2,495	2,253	2,219	2,154	2,005	2,031	1,440
	Imperial Oil	Nanticoke, ON	3,480	3,880	4,300	-	-	-	-	-	-	-	840	2,419	862
	Imperial Oil	Regina, SK	-	-	-	-	-	-	-	-	-	610	-	-	-
	Imperial Oil	Sarnia, ON	660	690	-	-	-	1,430	1,297	1,154	-	1,067	913	799	1,980
	Imperial Oil	Winnipeg, MB	-	-	-	-	-	-	-	-	-	2,020	-	-	-
	Irving Oil Limited	Saint-John, NB	1,820	1,840	1,750	2,150	1,700	1,690	-	-	-	-	-	-	3,960
	North Atlantic Refining Limited	Come-by-Chance, NL	2,320	1,270	1,100	4,220	-	1,100	485	-	1,273	-	-	1,059	438
	Parkland Refining Limited	Bowden, AB	5,650	5,680	4,620	4,730	3,880	4,820	3,781	-	-	-	-	-	-
	Petro-Canada	Edmonton, AB	-	-	-	-	-	-	-	-	513	477	399	-	-
	Petro-Canada	Montréal, QC	2,910	3,720	3,540	2,430	5,330	3,510	3,071	2,044	1,600	2,000	2,400	1,132	-
	Petro-Canada	Oakville, ON	3,570	3,500	3,810	3,720	3,160	2,990	2,839	3,216	3,026	3,107	1,991	-	-
	Shell Canada Products	Corunna, ON	4,050	4,040	4,200	4,090	3,720	3,780	3,676	3,658	4,390	4,313	4,165	3,699	-
	Shell Canada Products	Fort Saskatchewan, AB	-	-	270	-	480	470	-	-	441	310	-	-	-
	Shell Canada Products	Montréal, QC	2,060	2,230	1,900	3,020	2,470	2,110	2,431	2,050	2,153	2,847	2,751	2,030	-
	Suncor Energy Products Incorporated	Sarnia, ON	1,290	1,620	2,370	2,650	2,010	2,300	2,291	1,958	1,678	1,404	1,794	1,312	2,873
	Ultramar Limitée	Lévis // St-Romuald, QC	800	760	860	-	-	-	-	-	-	-	-	-	-
<b>Importer</b>	Canadian National Railway	Surrey, BC	-	-	-	-	-	-	-	-	-	-	-	-	2,038
	Canadian Pacific Railway	Calgary, AB	-	-	-	-	-	-	-	-	-	-	-	-	4
	Coco Paving Inc.	Windsor, ON	-	-	-	-	-	-	-	-	-	500	500	-	-
	Daigle Oil Limited	Edmundston, NB	-	-	-	-	-	1,750	-	-	-	-	-	-	-
	Imperial Oil	Burnaby, BC	-	-	-	-	-	-	-	-	-	-	1,590	-	-
	Mackenzie Petroleum Limited	Dawson City, YT	-	-	-	4,730	3,730	4,130	3,592	4,100	2,967	1,905	2,190	1,912	-
	Marine Petrobulk Limited.	Vancouver, BC	-	-	-	-	-	-	500	-	-	-	-	-	-
	North 60 Petroleum Limited	Whitehorse, YT	-	-	-	-	-	2,710	-	-	-	-	-	-	-

			Sulphur Levels (mg/kg)												
	Facility Name	Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	Northern Transportation	Iqaluit, NU	-	-	-	800	-	1,840	-	-	-	-	-	-	-
	Parkland Refining Limited	Bowden, AB	-	-	-	4,730	3,500	4,780	3,621	4,074	2,827	2,294	1,875	1,379	1,143
	Petro-Canada	Oakville, ON	-	-	-	3,700	2,510	3,030	2,812	-	-	-	-	-	-
	Ultramar Limitée	Holyrood, NFL	-	-	-	-	-	-	-	-	-	-	2,690	-	-
National Average			2,150	2,360	2,580	2,990	2,300	2,170	2,480	2,467	2,469	2,180	2,177	2,156	1,631

#### Appendix 3.4b: Volume Weighted Quarterly Sulphur Levels in High-Sulphur Diesel for 2007

			Sulphur Levels (mg/kg)				
	Facility Name	Location	Q1	Q2	Q3	Q4	Annual
Refiner	Chevron Canada Limited	Burnaby, BC	3,720	1,910	0	130	1,835
	Imperial Oil	Dartmouth, NS	1,050	1,500	0	0	1,220
	Imperial Oil	Nanticoke, ON	862	0	0	0	862
	Imperial Oil	Sarnia, ON	2,040	1,858	0	0	1,980
	Imperial Oil	Edmonton, AB	1,389	1,473	0	0	1,440
	Irving Oil Limited	Saint-John, NB	3,960	0	0	0	3,960
	Come-by-Chance, NL		355	620	0	0	438
	North Atlantic Refining Limited						
	Suncor Energy Products Incorporated	Sarnia, ON	0	2,873	0	0	2,873
Importer	Canadian National Railway	Surrey, BC	2,710	1,320	0	0	2,038
	Canadian Pacific Railway	Calgary, AB	4	0	0	0	4
	Parkland Refining Limited	Bowden, AB	1,170	1,343	1,170	910	1,143
National Average			1,782	1,607	1,170	150	1,631



**Appendix 3.5a: Volume Weighted Annual Sulphur Levels in Light Fuel Oil 1995 - 2007**

	Facility Name	Location	Sulphur Levels (mg/kg)												
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Refiner</b>	Husky Oil Operations Ltd.	Prince George, BC	-	-	514	599	590	600	599	703	403	274	150	-	-
	Imperial Oil	Dartmouth, NS	2,125	2,004	1,928	1,360	940	1,230	1,168	1,037	1,030	1,094	1,105	1,184	1,735
	Imperial Oil	Nanticoke, ON	2,950	3,189	3,327	1,791	2,000	1,950	1,269	-	2,770	-	-	-	-
	Imperial Oil	Sarnia, ON	1,668	1,803	1,417	2,260	1,830	1,690	2,277	2,047	1,414	2,279	1,991	2,133	-
	Irving Oil Limited	Saint-John, NB	-	-	1,731	2,080	1,770	1,660	1,630	1,553	1,304	1,740	1,489	1,555	1,446
	Newalta	Vancouver, BC	-	-	-	-	-	-	-	-	-	-	-	143	154
	North Atlantic Refining Limited	Come-by-Chance, NL	-	-	-	-	-	-	-	1,282	860	1,176	1,216	1,604	1,053
	NOVA Chemicals Canada Limited	Corunna, ON	1,520	1,450	1,550	1,850	1,770	1,450	1,449	1,252	1,117	1,063	887	820	406
	Petro-Canada	Montréal, QC	2,577	3,591	2,753	3,336	3,360	3,470	3,129	2,509	2,400	2,298	1,883	1,033	335
	Petro-Canada	Oakville, ON	3,642	4,069	3,663	4,253	4,120	3,650	3,368	3,819	3,710	3,433	2,380	-	-
	Shell Canada Products	Corunna, ON	3,000	-	-	-	-	-	-	-	-	-	-	-	-
	Shell Canada Products	Montréal, QC	2,357	2,256	2,784	2,837	2,720	2,770	2,895	2,291	2,468	2,814	2,693	2,875	2,564
	Suncor Energy Incorporated	Fort McMurray, AB	-	-	-	-	-	-	-	-	-	-	-	2,991	2,963
	Suncor Energy Products Incorporated	Sarnia, ON	1,591	1,758	2,144	2,578	2,190	2,960	1,810	2,376	1,654	1,500	1,827	1,249	1,540
	Ultramar Limitée	Lévis // St-Romuald, QC	1,120	1,281	1,355	2,231	1,810	1,630	1,539	1,215	1,074	1,086	-	467	1,471
<b>Importer</b>	Daigle Oil Limited	Edmundston, NB	-	-	-	-	-	3,000	3,000	3,000	500	-	-	14	-
	Flying J Inc	Calgary, AB	-	-	-	-	-	-	-	-	-	-	-	-	-
	Flying J Inc	London, ON	-	-	-	-	-	-	-	-	-	-	-	-	-
	Irving Oil Limited	Saint-John, NB	-	-	-	-	-	-	-	-	-	-	-	-	1,263
	North 60 Petroleum Limited	Whitehorse, YT	-	-	-	1,000	1,000	1,000	2,700	-	-	-	-	-	-
	Olco Petroleum Group	Beauport, QC	-	-	-	-	2,300	-	-	-	-	-	-	-	-
	Olco Petroleum Group	Montréal, QC	-	-	-	-	2,300	-	-	-	-	-	-	-	-
	Petro-Canada	Oakville, ON	-	-	-	3,880	3,880	-	3,440	3,600	-	-	-	-	-
	Pétroles Norcan	Montréal, QC	-	-	-	-	-	-	-	-	2,740	-	-	-	-
	Port Colborne Quarries Limited	Port Colborne	-	-	-	-	-	-	-	-	2,231	1,274	1,254	1,262	-
	Statia Terminals Canada	Point Tupper, NS	-	-	-	-	-	-	1,020	-	-	-	-	-	-
	Ultramar Limitée	Lévis // St-Romuald, QC	-	-	-	-	-	-	1,643	-	-	-	-	-	-
<b>National Average</b>			1,980	2,150	2,000	2,270	2,030	2,030	1,890	1,763	1,543	1,673	1,594	1,417	1,393

### Appendix 3.5b: Volume Weighted Quarterly Sulphur Levels in Light Fuel Oil for 2007

	Facility Name	Location	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
<b>Refiner</b>	Imperial Oil	Dartmouth, NS	1,180	2,030	2,200	2,210	1,735
	Irving Oil Limited	Saint-John, NB	1,258	1,866	1,794	1,263	1,446
	Newalta	Vancouver, BC	200	100	200	100	154
	North Atlantic Refining Limited	Come-by-Chance, NL	1,800	189	199	1,598	1,053
	NOVA Chemicals Canada Limited	Corunna, ON	422	365	400	450	406
	Petro-Canada	Montréal, QC	480	78	480	226	335
	Shell Canada Products	Montréal, QC	2,200	3,100	2,500	2,600	2,564
	Suncor Energy Incorporated	Fort McMurray, AB	2,765	2,944	3,085	3,129	2,963
	Suncor Energy Products Incorporated	Sarnia, ON	6	430	2,016	0	1,540
	Ultramar Limitée	Lévis // St-Romuald, QC	130	4	4	3,175	1,471
<b>Importer</b>	Irving Oil Limited	Saint-John, NB	1,258	1,866	1,794	1,263	1,263
<b>National Average</b>			976	1,320	1,399	1,950	1,393

**Appendix 3.6a: Volume Weighted Annual Sulphur Levels in Heavy Fuel Oil 1995 – 2007**

	Facility Name	Location	Sulphur Levels (mg/kg)												
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Refiner</b>	Chevron Canada	Burnaby, BC	14,663	17,832	15,153	15,107	17,880	-	-	-	-	-	-	-	-
	Consumers' Co-operative Refineries Limited	Regina, SK	8,313	12,315	11,207	8,986	8,870	10,640	7,032	9,122	8,742	5,531	6,244	6,669	4,772
	Husky Oil Operations Ltd.	Prince George, BC	26,300	16,636	13,800	19,549	20,340	17,200	14,818	16,976	21,185	23,878	23,577	21,937	-
	Imperial Oil	Dartmouth, NS	14,698	13,590	12,664	15,820	13,540	14,130	14,959	12,553	13,778	14,836	13,124	11,747	11,905
	Imperial Oil	Edmonton, AB	15,302	15,080	15,493	13,697	12,660	12,930	13,864	13,598	14,378	14,014	15,025	17,601	18,156
	Imperial Oil	Nanticoke, ON	23,022	23,325	25,815	27,319	22,780	17,030	14,610	12,613	11,294	17,208	16,033	16,962	18,059
	Imperial Oil	Sarnia, ON	21,970	20,153	21,840	22,530	19,900	17,980	19,465	14,922	17,846	19,000	17,860	20,448	21,000
	Irving Oil Limited	Saint-John, NB	20,850	18,612	18,396	18,409	17,800	16,270	17,454	15,917	16,781	13,471	17,965	15,215	16,350
	Newalta	Vancouver, BC	-	-	-	-	-	-	-	-	-	6,444	6,038	6,880	4,975
	North Atlantic Refining Limited	Come-by-Chance, NL	17,876	22,302	28,323	26,460	28,070	28,410	26,267	-	24,368	21,500	-	-	-
	NOVA Chemicals Canada Limited	Corunna, ON	11,840	11,990	13,520	14,690	13,870	11,750	11,751	12,411	11,584	11,990	10,872	10,051	9,930
	Petro-Canada	Edmonton, AB	23,009	26,568	25,890	23,736	22,160	24,500	22,128	21,219	21,839	15,821	-	-	-
	Petro-Canada	Montréal, QC	20,644	22,130	21,072	19,730	15,450	18,810	17,034	16,348	15,100	12,458	11,558	12,295	12,718
	Petro-Canada	Oakville, ON	14,702	15,029	15,848	16,099	14,270	14,240	13,425	14,540	12,070	13,045	10,761	-	-
	Shell Canada Products	Corunna, ON	25,835	27,398	28,326	26,485	25,130	25,540	25,736	24,339	24,335	22,829	23,130	23,735	23,615
	Shell Canada Products	Montréal, QC	17,723	19,447	18,230	17,679	15,960	14,210	15,828	12,890	12,782	14,712	15,409	17,003	15,088
	Suncor Energy Products Incorporated	Sarnia, ON	17,317	18,351	20,169	20,539	17,220	20,240	18,239	19,480	18,561	17,741	20,161	20,328	20,993
	Ultramar Limitée	Lévis // St-Romuald, QC	8,324	10,070	11,361	11,440	11,100	10,990	10,165	9,790	9,626	8,666	9,155	6,722	7,820
<b>Importer</b>	Alcan inc	Jonquiere, QC	-	-	-	-	-	-	-	-	-	-	-	-	19,401
	Catalyst Paper Corporation	Campbell River, BC	-	-	-	-	-	-	-	-	-	-	-	7,153	6,010
	Catalyst Paper Corporation	Crofton, BC	-	-	-	-	-	-	-	-	-	-	-	8,148	7,462
	Cervini Farms	Leamington, ON	-	-	-	-	-	-	-	-	-	15,000	13,500	13,500	4,000
	Companie Miniere de Quebec Cartier	Port-Cartier, QC	-	-	-	-	-	-	-	-	-	15,944	-	17,563	17,619
	Compaq Papiers	Stadacona, QC	-	-	-	-	-	-	-	-	19,259	-	-	-	-
	Emera Fuels Inc.	Dartmouth, NS	-	-	-	-	-	-	-	-	27,200	-	-	-	-

			Sulphur Levels (mg/kg)												
	Facility Name	Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	Great Lakes Greenhouses Inc	Leamington, ON	-	-	-	-	-	-	-	-	-	15,060	15,932	10,396	9,063
	Kildair Services Ltée	Tracy, QC	-	-	-	4,150	8,290	18,080	8,006	15,000	8,355	9,230	4,751	5,300	-
	Marine Petrobulk Limited.	Vancouver, BC	-	-	-	-	-	17,920	24,000	16,390	18,406	18,796	18,500	18,500	18,363
	Murphy Oil USA	Superior, WI	-	-	-	45,710	18,230	-	-	-	-	-	-	-	-
	Neucel Specialty Cellulose	Port Alice, BC	-	-	-	-	-	-	-	-	-	-	-	-	11,754
	New Brunswick Power Corporation	Fredericton, NB	-	-	-	27,360	27,820	27,800	27,269	25,194	25,541	27,419	27,206	27,026	26,071
	Newalta	Vancouver, BC	-	-	-	-	-	-	-	-	-	-	4,305	-	-
	Newfoundland & Labrador Hydro	St. John's	-	-	-	19,960	19,940	20,970	20,600	20,186	20,604	20,941	19,424	9,214	9,232
	Nexfor Fraser Papers Incorporated	Edmundston, NB	-	-	-	-	4,280	3,980	4,214	4,379	4,634	4,656	4,613	4,721	4,002
		Campbell River, BC	-	-	-	-	-	-	10,237	9,400	-	9,161	7,393	-	-
	Norske Canada	Crofton, BC	-	-	-	-	-	-	9,871	-	-	9,835	6,599	-	-
	North 60 Petroleum Limited	Whitehorse, YT	-	-	-	6,530	3,440	2,430	4,313	4,288	4,250	3,830	-	-	-
	North Atlantic Refining Limited	Come-by-Chance, NL	-	-	-	-	-	-	-	25,491	20,230	19,394	18,911	15,919	12,824
	Nova Scotia Power	Halifax, NS	-	-	-	27,030	25,990	26,810	28,102	19,728	17,868	20,120	19,513	19,700	14,300
	Ontario Limited	Leamington, ON	-	-	-	-	-	-	-	-	-	-	14,855	7,437	7,115
	Pope and Talbot Limited	Nanaimo, BC	-	-	-	-	-	10,600	10,216	10,749	9,646	10,036	9,445	9,731	9,352
		Point Tupper, NS	-	-	-	-	-	-	8,268	-	-	-	-	-	-
	Statia Terminals Canada														
	Vancouver General Hospital	Vancouver, BC	-	-	-	-	-	10,600	10,600	-	-	-	-	-	-
	Western Pulp	Port Alice, BC	-	-	-	-	-	14,510	14,840	13,478	13,822	12,873	-	-	-
Western Pulp	Squamish, BC	-	-	-	-	-	-	11,000	-	-	-	-	-	-	
National Average			16,761	17,300	17,250	17,220	17,710	17,400	17,280	15,366	15,347	15,763	16,444	14,705	14,831

### Appendix 3.6b: Volume Weighted Quarterly Sulphur Levels in Heavy Fuel Oil for 2007

	Facility Name	Location	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
<b>Refiner</b>	Consumers' Co-operative Refineries Limited	Regina, SK	4,307	4,915	4,758	4,963	4,772
	Imperial Oil	Dartmouth, NS	9,854	12,022	13,043	12,483	11,905
	Imperial Oil	Nanticoke, ON	16,120	0	0	0	18,059
	Imperial Oil	Sarnia, ON	0	0	21,000	0	21,000
	Imperial Oil	Edmonton, AB	17,553	17,949	18,315	18,785	18,156
	Irving Oil Limited	Saint-John, NB	16,400	17,000	15,700	15,500	16,350
	Newalta	Vancouver, BC	5,236	5,300	4,817	4,557	4,975
	NOVA Chemicals Canada Limited	Corunna, ON	8,259	9,333	10,212	11,419	9,930
	Petro-Canada	Montréal, QC	13,400	12,300	12,800	12,400	12,718
	Shell Canada Products	Montréal, QC	18,427	14,869	12,681	13,489	15,088
	Shell Canada Products	Corunna, ON	22,600	22,486	23,738	25,239	23,615
	Suncor Energy Products Incorporated	Sarnia, ON	17,166	21,546	23,293	22,032	20,993
		Lévis // St-Romuald, QC	8,638	7,752	7,478	7,587	7,820
	Ultramar Limitée						
<b>Importer</b>	Ontario Limited	Leamington, ON	4,300	9,400	9,200	8,100	7,115
	Alcan inc	Jonquiere, QC	19,200	19,600	0	0	19,401
	Catalyst Paper Corporation	Crofton, BC	3,100	8,500	7,800	9,500	7,462
	Catalyst Paper Corporation	Campbell River, BC	3,100	8,500	7,800	5,800	6,010
	Cervini Farms	Leamington, ON	4,000	4,000	4,000	4,000	4,000
	Companie Miniere de Quebec						
	Cartier	Port-Cartier, QC	17,100	19,000	19,600	16,000	17,619
	Nexfor Fraser Papers Incorporated	Edmundston, NB	4,400	0	0	3,300	4,002
	Great Lakes Greenhouses Inc	Leamington, ON	0	9,500	9,200	8,800	9,063
	Marine Petrobulk Limited.	Vancouver, BC	18,500	18,500	18,300	18,200	18,363
	NB Power Generation		26,400	26,600	25,500	25,600	26,071
	Neucel Specialty Cellulose	Port Alice, BC	14,300	12,300	9,600	10,800	11,754
	Newfoundland & Labrador Hydro	St. John's	9,710	9,750	9,290	8,210	9,232
	North Atlantic Refining Limited	Come-by-Chance, NL	13,700	13,500	12,600	10,300	12,824
	Nova Scotia Power	Halifax, NS	14,300	0	0	0	14,300
	Pope and Talbot Limited	Nanaimo, BC	10,800	7,900	0	7,900	9,352
<b>National Average</b>			13,442	13,315	12,841	12,539	14,831

### Appendix 3.7a: Volume Weighted Annual Sulphur Levels in Aviation Gasoline 2000 - 2007

			Sulphur Levels (mg/kg)							
	Facility Name	Location	2000	2001	2002	2003	2004	2005	2006	2007
<b>Refiner</b>	Imperial Oil	Edmonton, AB	-	-	10	10	10	11	10	11
	Petro-Canada	Edmonton, AB	-	352	229	206	400	334	248	370
	Shell Canada Products	Montréal, QC	-	14	50	10	1	1	1	1
<b>Importer</b>	Imperial Oil	Burnaby, BC	-	30	-	-	-	-	-	-
	Imperial Oil	Edmonton, AB	-	10	-	-	-	-	-	-
<b>National Average</b>			-	51	59	35	59	43	32	32

*Note:* Sulphur levels in aviation gasoline were averaged with motor gasoline levels for the years 1995 to 2000.

See Table A3.1.a

### Appendix 3.7b: Volume Weighted Quarterly Sulphur Levels in Aviation Gasoline for 2007

			Sulphur Levels (mg/kg)				
	Facility Name	Location	Q1	Q2	Q3	Q4	Annual
<b>Refiner</b>	Imperial Oil	Edmonton, AB	10	12	10	11	11
	Petro-Canada	Edmonton, AB	0	400	345	0	370
	Shell Canada Products	Montréal, QC	1	1	1	1	1
<b>National Average</b>			7	34	36	8	32

### Appendix 3.8a: Volume Weighted Annual Sulphur Levels in Aviation Turbo (Jet) Fuel 1995 - 2007

	Facility Name	Location	Sulphur Levels (mg/kg)												
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Refiner</b>	BP West Coast Products LLC	Blaine, WA	-	-	-	-	-	-	-	-	-	766	-	-	-
	Chevron Canada Limited	Burnaby, BC	410	447	-	605	1,006	1,129	745	781	741	637	720	891	892
	Imperial Oil	Dartmouth, NS	542	447	-	776	522	657	750	1,003	727	881	736	541	595
	Imperial Oil	Nanticoke, ON	-	1,714	-	2,015	1,340	989	823	810	466	939	840	781	807
	Imperial Oil	Sarnia, ON	449	86	-	99	76	83	94	100	100	100	64	12	6
	Imperial Oil	Strathcona, AB	-	436	-	491	483	484	527	536	485	536	531	222	1
	Irving Oil Limited	St.John, NB	1,657	1,708	-	1,853	1,738	1,719	1,777	2,263	2,263	2,316	2,256	2,290	2,135
	North Atlantic Refining Limited	Come-by-Chance, NL	-	-	-	2,119	1,787	1,808	2,264	2,097	1,383	1,222	1,769	2,123	2,512
		Edmonton, AB	-	2	-	13	7	-	12	-	6	4	7	5	5
	Petro-Canada	Montreal, QC	-	157	-	84	110	1,297	947	914	1,120	938	-	-	-
	Petro-Canada	Oakville, ON	-	627	-	731	478	360	326	319	249	267	-	-	-
	Shell Canada Products	Montreal, QC	449	445	-	291	262	334	285	256	319	574	481	565	415
	Shell Canada Products	Sarnia, ON	-	100	-	633	532	377	429	1,217	1,250	1,568	1,205	956	564
	Shell Canada Products	Fort Saskatchewan, AB	-	50	-	50	100	100	90	100	100	100	100	100	100
	Suncor	Sarnia, ON	-	700	-	1,259	1,034	993	1,082	1,570	1,311	1,079	1,231	876	637
<b>Importer</b>		Levis // St.Romauld, QC	-	-	-	267	399	496	371	345	267	259	44	83	29
	Ultramar Limited	QC													
	Air Canada	Hamilton, ON	-	-	-	-	-	-	-	-	438	683	-	589	438
	Air Canada	Quebec, QC	-	-	-	-	-	-	-	-	1,312	347	1,277	626	1,007
		Westridge, AB	-	-	-	-	-	-	-	-	631	322	584	759	933
	Air Canada	AB													
	BP West Coast Products LLC	Blaine, WA	-	-	-	-	-	534	606	461	599	789	643	655	831
<b>Refiner</b>	Imperial Oil	Burnaby, BC	-	-	-	193	234	370	110	-	330	240	25	3	3
	Imperial Oil	Quebec City	-	-	-	-	-	-	-	-	-	-	-	336	541

			Sulphur Levels (mg/kg)												
	Facility Name	Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	Mackenzie Petroleum Limited	Dawson City, YT	-	-	-	-	1,000	1,000	900	800	830	658	743	643	-
	NOCO Energy Canada Inc.	Toronto, ON	-	-	-	-	-	182	169	240	-	273	-	-	-
	North 60 Petroleum Limited	Whitehorse, NWT	-	-	-	-	1,000	1,000	-	-	-	724	738	-	-
	North Atlantic Refining Limited	Come-by-Chance, NL	-	-	-	-	-	-	-	-	-	-	-	-	1,780
	Petro-Canada	Port Moody, BC	-	-	-	174	234	316	5	10	133	143	393	6	5
	Pétroles Norcan	Montreal-Est	-	447	-	-	203	-	-	-	99	-	-	3	-
	Shell Canada Products	Montreal, QC	-	-	-	-	-	-	-	-	-	458	316	621	500
	Shell Canada Products	Burnaby, BC	-	-	-	-	-	-	-	-	-	100	337	311	478
	Shell Canada - Port of Montreal, QC	Montreal, QC	-	-	-	-	-	-	-	-	-	-	-	-	873
	Shell Canada - Quebec Imports, QC	Quebec	-	-	-	-	-	-	-	-	-	-	-	-	1,582
	Ultramar Limited	Holyrood, NFL	-	-	-	-	-	-	-	-	360	279	-	-	-
	Ultramar Limited	Montreal, QC	-	-	-	-	-	-	-	-	775	426	-	454	214
	Ultramar Limited	Levis // St.Romauld, QC	-	-	-	-	-	-	-	-	-	240	-	170	-
National Average			-	-	-	-	-	-	-	775	-	426	654	549	581



**Appendix 3.8b: Volume Weighted Quarterly Sulphur Levels in Aviation Turbo (Jet) Fuel for 2007**

	Facility Name	Location	Sulphur Levels (mg/kg)				
			Q1	Q2	Q3	Q4	Annual
<b>Refiner</b>	Chevron Canada Limited	Burnaby, BC	760	980	930	910	892
	Imperial Oil	Darmouth, NS	1,080	660	400	400	595
	Imperial Oil	Nanticoke, ON	670	0	0	0	807
	Imperial Oil	Sarnia, ON	7	7	5	3	6
	Imperial Oil	Strathcona, AB	1	1	2	1	1
	Irving Oil Limited	St. John, NB	2,212	1,981	2,066	2,276	2,135
	North Atlantic Refining Limited	Come-by-Chance, NL	2,490	2,690	2,580	1,780	2,512
	Petro-Canada	Edmonton, AB	6	4	5	7	5
	Shell Canada Products	Montréal, QC	500	400	300	600	415
	Shell Canada Products	Sarnia, ON	600	400	300	1,400	564
	Shell Canada Products	Scotford, AB	100	100	100	100	100
	Suncor	Sarnia, ON	534	736	627	656	637
	Ultramar Limited	Lévis // St-Romuald, QC	0	35	23	0	29
<b>Importer</b>	Air Canada	Hamilton, ON	438	0	0	0	438
	Air Canada	Quebec	658	1,360	1,082	851	1,007
	Air Canada	Westridge, AB	622	922	987	1,228	933
	BP West Coast Products, LLC	Blaine, WA	540	1,010	770	950	831
	Imperial Oil	Burnaby, BC	3	0	0	0	3
	Imperial Oil	Quebec City	0	2,260	132	297	541
	North Atlantic Refining Limited	Dawson City, YT	2,490	2,690	2,580	1,780	1,780
	Petro-Canada	Port Moody, BC	5	5	6	6	5
	Shell Canada Products	Montréal, QC	500	400	300	600	500
	Shell Canada - Port of Montreal, QC	Montreal, QC	1,200	300	0	0	873
	Shell Canada - Quebec Imports, QC	Quebec	0	0	1,000	1,700	1,582
	Shell Canada Products	Burnaby, BC	0	0	1,300	300	478
	Ultramar Limited	Montréal, QC	350	0	0	8	214
<b>National Average</b>			451	550	534	630	581

## **Appendix 4**

### **Canadian General Standards Board Standards for Sulphur Content in Fuels**

**Canadian General Standards Board**  
**Standards for Sulphur Content in Fuels**

<b>Specification Number</b>	<b>Fuel Category</b>	<b>Maximum Sulphur Content (mg/kg)</b>
CAN/CGSB-3.5-2004 (Amend. no. 2 Apr. 2007) CAN/CGSB-3.511-2005 (Amend. No. 2 Apr. 2007) CAN/CGSB-3.25-2004 (Amend. No. 1 Dec. 2005)	<b>Gasoline</b> Unleaded, Automotive Oxygenated Unleaded Automotive (containing Ethanol) Aviation	80 <sup>1</sup> 80 <sup>2</sup> 500
CAN/CGSB-3.23-2005 (Amend. No. 1 July 2006) CAN/CGSB-3.22-2002 (Amend. No. 4 July 2004) CAN/CGSB-3.24-2005 (Amend. No. 1 July 2005)	<b>Aviation Turbine Fuel</b> Kerosene Type (Jet A, Jet A-1) Wide Cut Type (Jet B, F-40) Military Grades (F-34, F-44)	3 000 4 000 3 000
CAN/CGSB-3.3-2007	<b>Kerosene</b> Type No. 1-K Type No. 2-K	400 3 000
CAN/CGSB 3.6-2000 (Amend. No. 2 Sept. 2004)  CAN/CGSB-3.517-2007  CAN/CGSB-3.520-2005 (Amend. No. 1 Mar. 2006, Amend. No. 2 Apr. 2007)	<b>Diesel Fuel</b> Regular Sulphur - Type A Regular Sulphur - Type B Automotive (On-road) – Type A & B - LS Automotive (On-road) – Type A & B - ULS Automotive Low-Sulphur Diesel Fuel Containing Low Levels of Biodiesel Esters (B1–B5): - Type A & B – LS - Type A & B - ULS	3 000 5 000 500 15  500 15
CAN/CGSB-3.16-99	<b>Mining Diesel Fuel</b> Special Special - Low Sulphur	2 500 500
CAN/CGSB-3.2-2007	<b>Heating Fuel Oil</b> Type 0 Type 1 Type 2 Type 4 Type 5 Type 6	3 000 3 000 5 000 No limit No limit No limit
3-GP-11d (November 2002) (Amend. No. 1 Sept. 2004)	<b>Naval Distillate Fuel</b> Type 11  Type 15	5 000  5 000
CAN/CGSB-3.27-2005  CAN/CGSB-3.18-2000 (Amend. No. 2 Sept. 2004)	<b>Naphtha Fuel</b>  <b>Diesel Fuel for Locomotive Type</b> Medium-Speed Diesel Engines	5  5 000

<sup>1</sup> Changed to 80 mg/kg from 300 mg/kg - CAN/CGSB-3.5-2004 Amendment No. 2, April 2007.

<sup>2</sup> Changed to 80 mg/kg from 300 mg/kg - CAN/CGSB-3.511-2005 Amendment No. 2, April 2007.

## **Appendix 5**

### **Maximum Sulphur Content in Fuels According to Federal and Provincial Regulations and Municipal By-Laws**

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

<b>Jurisdiction</b>	<b>Act/Regulation/By-Law</b>	<b>Regulation Adopted</b>	<b>Maximum Sulphur Content (% mass)</b>
<b>Canada</b>	<i>Canadian Environmental Protection Act 1999</i>		
	Sulphur in Diesel Fuel Regulations (start 2003)	2002  2005 amendments	<b><u>Diesel</u></b> 0.05 (on-road – until mid-2006) 0.0015 (after mid-2006 – on-road)  0.05 (2007 – off-road, rail, marine) 0.0015 (2010 – off-road) 0.0015 (2012 – rail, marine)
	Sulphur in Gasoline Regulations	1999	<b><u>Gasoline</u></b> 0.015 ave./0.03 cap (2002–2004) <sup>1</sup> 0.003 ave./0.008 cap (2005) <sup>1</sup>
<b>New Brunswick</b>	<i>Clean Air Act</i> Air Quality Regulation	1983 (amended 1990 and 1998)	<b><u>Fuel Oil</u></b> 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
<b>Newfoundland and Labrador</b>	<i>Environmental Protection Act</i> Air Pollution Control Regulations	May 20, 2004	<b><u>Fuel Oil</u></b> Any fuel oil grade Type Nos. 4, 5 or 6: <ul style="list-style-type: none"> <li>• Where Best Available Technology (BAT) is employed: <ul style="list-style-type: none"> <li>- 3.0%, and</li> <li>- 2.0% on an annual basis.</li> </ul> </li> <li>• Where BAT is not employed: <ul style="list-style-type: none"> <li>- 2.2%, and</li> <li>- 2.0% on an annual basis.</li> </ul> </li> </ul>
<b>Nova Scotia</b>	<i>Environment Act</i> Air Quality Regulations	March 2005	<b><u>Fuel Oil</u></b> - 2.2% by mass, and - 2.0% on an annual basis.
<b>Prince Edward Island</b>	<i>Petroleum Products Act</i> Petroleum Products Act Regulations	March 2001	Minimum specifications for the type or grade of petroleum product as issued by the CGSB or Public Utilities Commission.

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<sup>1</sup> Have various options. See regulation for details.

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

(Cont'd)

Jurisdiction	Act /Regulation/By-Law	Regulation Adoption	Maximum Sulphur Content (% by wt.)
Quebec	<i>Petroleum Products and Equipment Act</i> Petroleum Products Regulation	1991 (amended 1996, 1998, 1999 and 2006 <sup>2</sup> )	<p><b>Gasoline:</b> Grades 1, 2, 3, 4 = 0.0080  <b>Gasoline containing fuel ethanol:</b> = 0.0080  <b>Diesel</b></p> <ul style="list-style-type: none"> <li>- Type 1 (Regular Sulphur) :</li> <li>- Type A = 0.3</li> <li>- Type B = 0.5</li> <li>- Types 2 (Low-Sulphur) = 0.05 Type 3 (Ultra-Low-Sulphur) = 0.0015</li> </ul> <p><b>Diesel fuel containing biodiesel fuel</b></p> <ul style="list-style-type: none"> <li>- Type A and B – LS = 0.05</li> </ul> <p><b>Heating Fuel Oil:</b></p> <ul style="list-style-type: none"> <li>- Types Nos. 0, 1 = 0.3</li> <li>- Type No. 2 = 0.5</li> <li>- Types Nos. 4, 5, 6 = no limit</li> <li>-</li> </ul> <p><b>Aviation Fuel:</b></p> <ul style="list-style-type: none"> <li>- Type 1 Aviation Gasoline = 0.05</li> <li>- Type 2 Aviation Turbine Fuel:</li> <li>- Jet A, Jet A-1 and F-34 = 0.30</li> <li>- Jet B and F-40 = 0.4</li> <li>- F-44 = 0.3</li> </ul>
	<i>Environment Quality Act</i> Regulation Respecting the Quality of the Atmosphere <sup>3</sup>	1981	<p><b>Fuel Oil</b></p> <p>Light Oil (LFO) = 0.5%  Intermediate Oil = 1.0%  Heavy Oil (HFO) = 2.0%</p>
	By-Law 90, Montreal Urban Community	1987	<p><b>Fuel Oil</b></p> <p>LFO Type No. 2 = 0.4%  HFO Type No. 6 = 1.25 to 1.4%</p>
Ontario	<i>Environmental Protection Act</i> Regulation 361, Sulphur Content of Fuels (effective in Metro Toronto only)	1970 (amended 1980, 1990 and 1999)	<p><b>Fuel Oil</b></p> <p>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</p>

<sup>2</sup> O.C. 226-2007, 12 March 2007, *Petroleum Products Regulations* – Maximum sulphur content determined by reference to CGSB specifications.

<sup>3</sup> <http://www.mddep.gouv.qc.ca/Infuseur/communiquer.asp?no=1202> – On October 1, 2007, Quebec announced its plan to lower sulphur content in industrial fuel oil from 2% to 1.5% and, in natural gas, to 1%.

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

(Cont'd)

	<b><i>Environmental Protection Act</i></b> Regulation 338, Boilers Regulation	1986 (amended 1999)	<b><u>Fuel Oil</u></b> All Fuel Oils – 1.0
<b>British Columbia</b>	<b><i>Environmental Management Act</i></b> <sup>4</sup> Sulphur Content of Fuel Regulation (B.C. Regulation 67/89 as amended, B.C. Reg. 321/2004)	1989	1.1
	<b><i>Environmental Management Act</i></b> Cleaner Gasoline Regulation (B.C. Reg. 498/95) as amended by Order in Council No. 010 in January 2006.		<b><u>Gasoline</u></b> 0.0080 <sup>5</sup>
<b>Yukon</b>	<b><i>Environment Act</i></b> Air Emissions Regulations	1998	<b><u>Fuel for heating, generating steam or electricity or combustion in industrial processes</u></b>  = 1.1, except as authorized by a permit issued under these Regulations.

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<sup>4</sup> *Environmental Management Act* 2003 replaced the *Waste Management Act* in 2004.

<sup>5</sup> Maximum sulphur content determined by reference to CGSB specifications

## **Appendix 6**

### **Average Sulphur Content in Fuel: Comparison of Levels Reported in 2007 and Limits Set by the Canadian General Standards Board and Provincial Regulations**



**Average Sulphur Content in Fuel: Comparison of Levels Reported in 2007 and Limits Set by the Canadian General Standards Board and Provincial Regulations**

1) Average reported sulphur content (%) versus CGSB standards

Type of Fuel	Reported Average Sulphur Content (%)			CGSB (% mass)
	Low Value	National Average	High Value	
Aviation Turbo Fuel	0.0001	0.0581	0.2690	0.30 - Jet A 0.40 - Jet B
Motor Gasoline	0.0001	0.0018	0.0062	0.10 - Unleaded
Aviation Fuel	0.0001	0.0027	0.0400	0.0500
Kerosene/Stove Oil	0.0002	0.0067	0.2350	0.04 - Type No. 1 -K 0.30 - Type No. 2 - K
Ultra Low Sulphur Diesel Fuel	0.0001	0.0004	0.0015	0.0015 - Automotive
Low Sulphur Diesel Fuel	0.0005	0.0091	0.0459	0.05 - Automotive
Diesel Fuel	0.0004	0.1605	0.3960	0.30 - Type A 0.50 - Type B
Light Fuel Oil	0.0004	0.1393	0.3175	0.30 - Type No. 0 0.50 - Type No. 1 0.50 - Type No. 2
Heavy Fuel Oil	0.3100	1.4831	2.6600	No Limits

2) Average reported sulphur content (%) for heavy fuel oil versus limits under provincial regulations

Region	Sulphur Content (%) in Heavy Fuel Oil (2007)	Provincial Regulations	
		Province	Sulphur Content Limit (%)
Atlantic	1.6224	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"> <li>Where Best Available Technology (BAT) is employed: <ul style="list-style-type: none"> <li>3%, or</li> <li>2% on an annual basis.</li> </ul> </li> <li>Where BAT is not employed: <ul style="list-style-type: none"> <li>2.2%, or</li> <li>2% on an annual basis.</li> </ul> </li> </ul>
		Nova Scotia (Proposed)	2.0 – All types
Quebec	1.0867	Quebec	2.0 - All types 1.25 to 1.4 – HFO Type No.6 (Montreal)
Ontario	1.9063	Ontario	1.0 - Boilers 1.5 - All Types (Toronto)
West	1.6996	B.C. Alberta Saskatchewan Manitoba Yukon N.W.T Nunavut	1.1 - All Types Not Regulated Provincially Not Regulated Provincially Not Regulated Provincially 1.1 <sup>1</sup> Not Regulated Provincially Not Regulated Provincially

<sup>1</sup> Fuel for heating, generating steam or electricity or combustion in industrial processes except as authorized by a permit issued under the *Air Emissions Regulations*.



**www.ec.gc.ca**

Additional information can be obtained at:

Environment Canada  
Inquiry Centre  
351 St. Joseph Boulevard  
Place Vincent Massey, 8th Floor  
Gatineau, Quebec K1A 0H3  
Telephone: 1-800-668-6767 (in Canada only) or 819-997-2800  
Fax: 819-994-1412  
TTY: 819-994-0736  
Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)

