



Canadian Council Le Conseil canadien
of Ministers des ministres
of the Environment de l'environnement

CANADA-WIDE STANDARDS FOR PARTICULATE MATTER AND OZONE

2012 FINAL REPORT

**PN 1526
ISBN 978-1-77202-009-0 PDF**

The Canadian Council of Ministers of the Environment (CCME) is the primary minister-led intergovernmental forum for collective action on environmental issues of national and international concern.

Canadian Council of Ministers of the Environment
123 Main St., Suite 360
Winnipeg, Manitoba R3C 1A3
Telephone: (204) 948-2090
Email: info@ccme.ca
Website: www.ccme.ca

PN 1526
ISBN: 978-1-77202-009-0
Ce document est également publié en français

EXECUTIVE SUMMARY

Under the Canada-wide Standards (CWS) for Particulate Matter and Ozone participating jurisdictions committed to provide an annual progress report on the measured ambient concentrations of fine particulate matter (PM_{2.5}) and ozone beginning in 2011.

This is the second progress report for the CWS for Particulate Matter and Ozone. The report compares the concentrations of PM_{2.5} and ozone for the 3-year period from 2010 to 2012 against their respective CWS targets. This is also the last progress report on the CWS because these standards have been replaced by new Canadian Ambient Air Quality Standards (CAAQS), agreed to by the Canadian Council of Ministers of the Environment (CCME), with the exception of Québec, in 2012. The federal government established these new standards as objectives under the *Canadian Environmental Protection Act, 1999* in May 2013. Jurisdictional reporting on the achievement of the CAAQS for PM_{2.5} and ozone will begin in 2014.

The CWS for Particulate Matter and Ozone was established by CCME in June 2000. Between 2001 and 2003 approximately 30% of Canadians lived in communities with PM_{2.5} levels above the CWS target and approximately 50% with ozone levels above the CWS target. This progress report demonstrates the significant progress which has been made since the establishment of the CWS. These improvements can be attributed to the numerous measures that were implemented in Canada and in the United States since 2000.

Between 2010 and 2012, most of the PM_{2.5} CWS reporting locations¹ recorded concentrations below the PM_{2.5} CWS target of 30 µg/m³. Three locations in British Columbia and five in Alberta recorded concentrations above the target. The concentrations recorded at these stations may have been influenced by smoke from forest fires.

For the period of 2010 to 2012, the ozone concentrations were above the ozone CWS target of 65 ppb at one location in Alberta and all but two locations in Ontario. The concentrations recorded above the ozone target may have been influenced by high background ozone concentrations and by transboundary air pollutants respectively.

Between 2010 and 2012 approximately 2% of Canadians lived in communities with PM_{2.5} levels above the CWS target, and approximately 28% lived in communities with ozone levels above the CWS target².

¹ Since the province of Québec is not a signatory to the CWS for PM_{2.5} and ozone, this report does not show PM_{2.5} and ozone data for Québec. Information on Québec's efforts to reduce ambient concentrations for PM_{2.5} and ozone is available at: http://www.mddefp.gouv.qc.ca/air/particules_ozone/index.htm.

² While Québec data are not included in this report, the two percentages were calculated considering both Québec data and its population.

The reductions in ambient concentrations of PM_{2.5} and ozone demonstrate the progress that has been made to date in order to achieve the long-term goal of the CWS for Particulate Matter and Ozone “to minimize the risks of these pollutants on human health and the environment.”

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	i
1. INTRODUCTION	1
2. CWS AMBIENT TARGETS.....	2
3. PM_{2.5} CONCENTRATIONS.....	2
4. OZONE CONCENTRATIONS	4
5. CONCLUDING OBSERVATIONS	7

LIST OF TABLES

Table 1: The CWS PM_{2.5} and ozone ambient targets	2
--	----------

LIST OF FIGURES

Figure 1: PM_{2.5} 3-year averages for reporting communities, 2010 to 2012.....	3
Figure 2: PM_{2.5} 3-year average values for reporting locations, 2010 to 2012.	4
Figure 3: Ozone 3-year averages for reporting communities, 2010 to 2012.	5
Figure 4: Ozone 3-year average values for reporting locations, 2010 to 2012.....	6

1. INTRODUCTION

Under the Canada-wide Standards (CWS) for Particulate Matter and Ozone participating jurisdictions committed to provide an annual progress report on the measured ambient concentrations of fine particulate matter (PM_{2.5}) and ozone beginning in 2011. This is the second progress report on the *CWS for Particulate Matter and Ozone*. The report compares the concentrations of PM_{2.5} and ozone for the 3-year period from 2010 to 2012 against their respective CWS targets³.

In October of 2012, federal, provincial and territorial Environment Ministers (with the exception of Québec)⁴ agreed to take further action to protect the health of Canadians and the environment with the implementation of a new Air Quality Management System (AQMS)⁵. The AQMS includes Canadian Ambient Air Quality Standards (CAAQS) for PM_{2.5} and ozone, which are more comprehensive and more ambitious than the CWS. These standards were adopted by CCME, with the exception of Québec, in 2012. The federal government established these new standards as objectives under the *Canadian Environmental Protection Act, 1999* on May 25, 2013⁶. Because the CAAQS replace the CWS, this is the final progress report on the CWS for Particulate Matter and Ozone. Reporting on the CAAQS for PM_{2.5} and ozone will begin in 2014.

Section 2 of this report provides information on the PM_{2.5} and ozone CWS targets. Sections 3 and 4 present the measured ambient concentrations of PM_{2.5} and ozone in the form of the CWS targets for the 3-year period from 2010 to 2012. Information on federal, provincial and territorial activities undertaken to address air pollutants, including particulate matter and ozone, is available on their respective websites. The final section of this report provides some concluding observations on the CWS for Particulate Matter and Ozone.

All of the ambient data included in this report were provided by jurisdictions through the National Air Pollution Surveillance (NAPS) program. Under the NAPS program, jurisdictions collaborate to monitor and share ambient measurements of pollutants across Canada. The data are centrally maintained by Environment Canada in the Canada-wide Air Quality Database, and each jurisdiction maintains its respective data.

³ Since the province of Québec is not a signatory to the CWS for PM_{2.5} and ozone, this report does not include PM_{2.5} and ozone data for Québec. Information on Québec's efforts to reduce ambient concentrations for PM_{2.5} and ozone is available at: http://www.mddefp.gouv.qc.ca/air/particules_ozone/index.htm.

⁴ Although Québec supports the general objectives of the AQMS, it will not implement the system since it includes federal industrial emission requirements that duplicate Québec's Clean Air Regulation. However, Québec will collaborate with jurisdictions on developing other elements of the system, notably air zones and airsheds.

⁵ More information on the AQMS is available at: www.ccme.ca.

⁶ A copy of the *Canada Gazette* notice for the CAAQS for PM_{2.5} and ozone is available at: <http://gazette.gc.ca/rp-pr/p1/2013/2013-05-25/html/notice-avis-eng.html>.

2. CWS AMBIENT TARGETS

The CWS targets for PM_{2.5} and ozone are presented in Table 1.

Table 1: The CWS PM_{2.5} and ozone ambient targets

Pollutant	Averaging time	Numerical Target	Statistical Form of the Target
PM_{2.5}	24-hour (calendar day)	30 µg/m³	The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.
Ozone	8-hour	65 ppb	The 3-year average of the annual 4th highest daily maximum 8-hour average concentrations.

The statistical form of the target specifies the PM_{2.5} and ozone concentrations that are to be used to evaluate the achievement status of the target. PM_{2.5} and ozone concentrations in the form of their targets are also referred to as the 3-year average.

3. PM_{2.5} CONCENTRATIONS

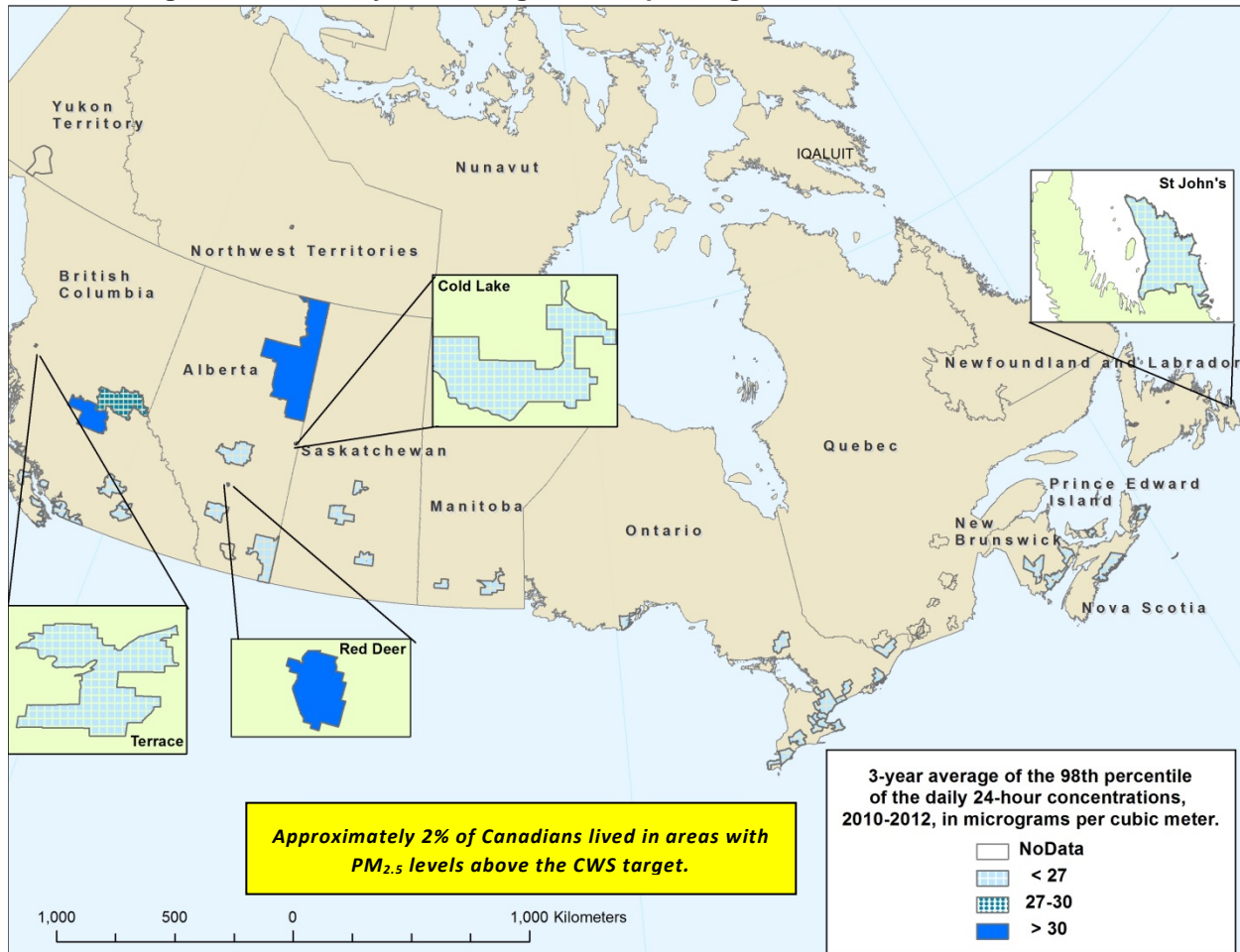
The PM_{2.5} 3-year averages for reporting communities and for reporting locations are presented in Figures 1 and 2. The 3-year averages ranged from 10 to 20 µg/m³ at the majority of locations. Only the Whitehorse monitoring station recorded a 3-year average below 10 µg/m³. Three locations in British Columbia and five in Alberta recorded 3-year averages above the PM_{2.5} target (30 µg/m³). One location in Alberta and two in British Columbia recorded 3-year averages within 10% of the target (indicated by the yellow band in Figure 2). The concentrations above the target that were recorded at the three locations in British Columbia and the five locations in Alberta may have been influenced by smoke from forest fires.

Newer continuous PM_{2.5} monitoring instruments have gradually replaced older monitors during the period from 2007 to 2012. These newer monitors measure a portion (semi-volatile) of the PM_{2.5} mass that was not captured by the older instruments. Concentrations measured with the new monitors may, therefore, not be directly comparable with the measurements from years in which the older instruments were used.

Since the 3-year averages for the period from 2010 to 2012 may be based on a mix of newer and older monitors, caution is recommended when comparing the 3-year averages between locations and to the CWS target.

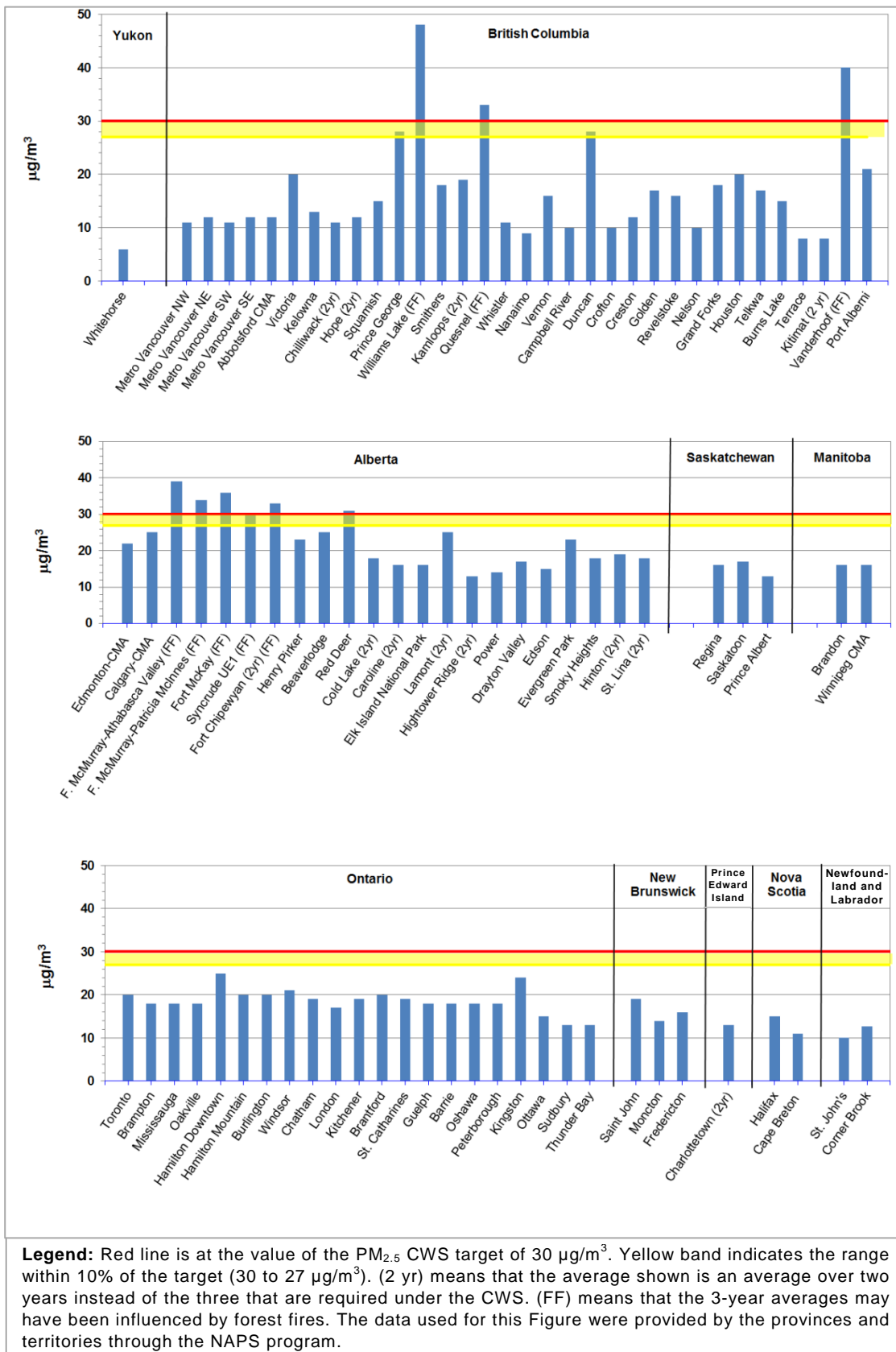
Between 2010 and 2012, approximately 2%⁷ of Canadians lived in areas with PM_{2.5} concentrations above the PM_{2.5} target.

Figure 1: PM_{2.5} 3-year averages for reporting communities, 2010 to 2012



⁷ While Québec PM_{2.5} data are not included in this report, this percentage was calculated considering both Québec's PM_{2.5} data and its population.

Figure 2: PM_{2.5} 3-year average values for reporting locations, 2010 to 2012

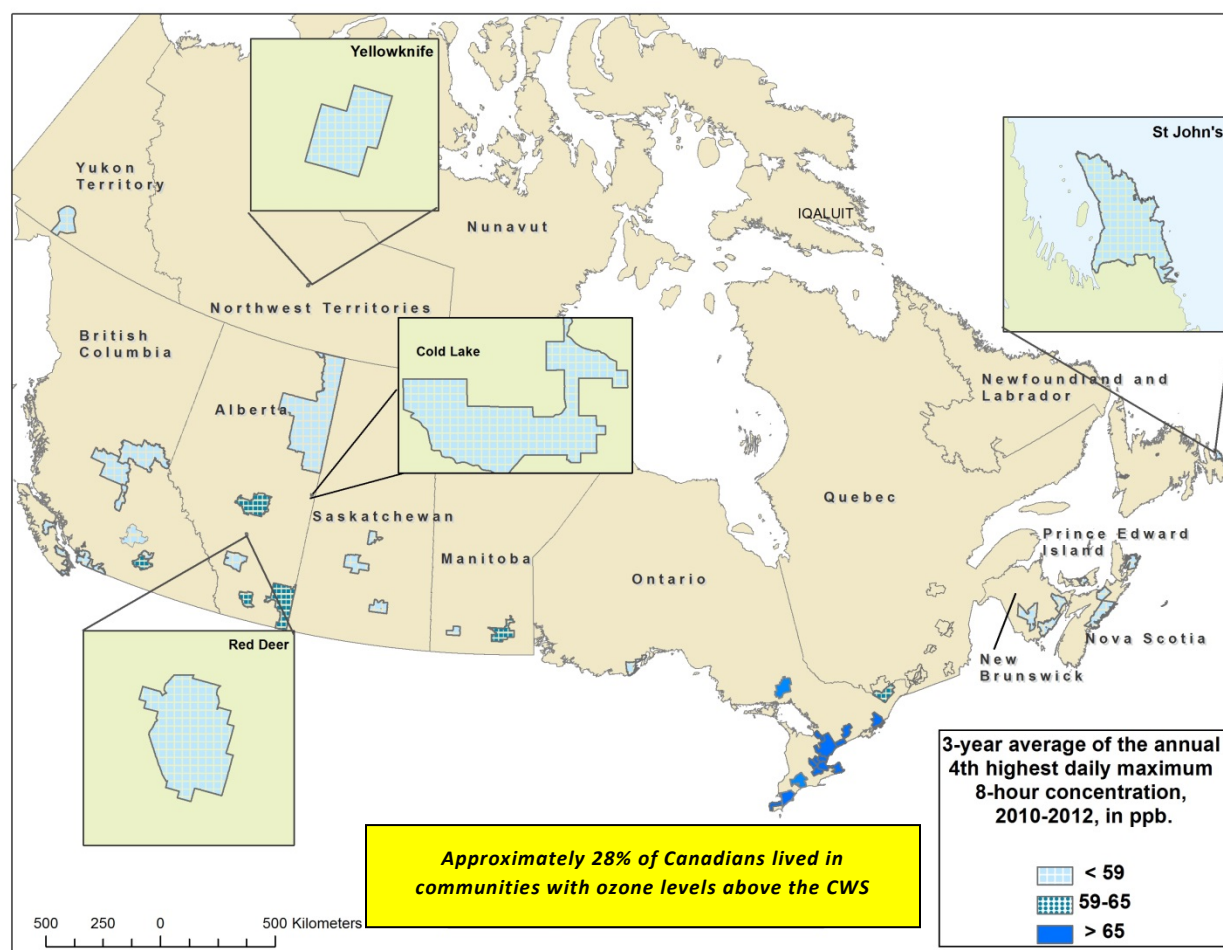


4. OZONE CONCENTRATIONS

The ozone 3-year averages for reporting communities and reporting locations are presented in Figures 3 and 4. The ozone 3-year averages ranged from 50 to 60 ppb at many locations across Canada. The 3-year averages were above the ozone CWS target of 65 ppb at the Hightower Ridge location in Alberta, and at all reporting locations in Ontario except for Ottawa and Thunder Bay. Six locations in Alberta recorded 3-year averages within 10% of the target. The ozone concentrations recorded above the target for the locations in Ontario may have been influenced by the transboundary flow of air pollutants while the concentrations recorded at Hightower Ridge may have been influenced by high background ozone concentrations.

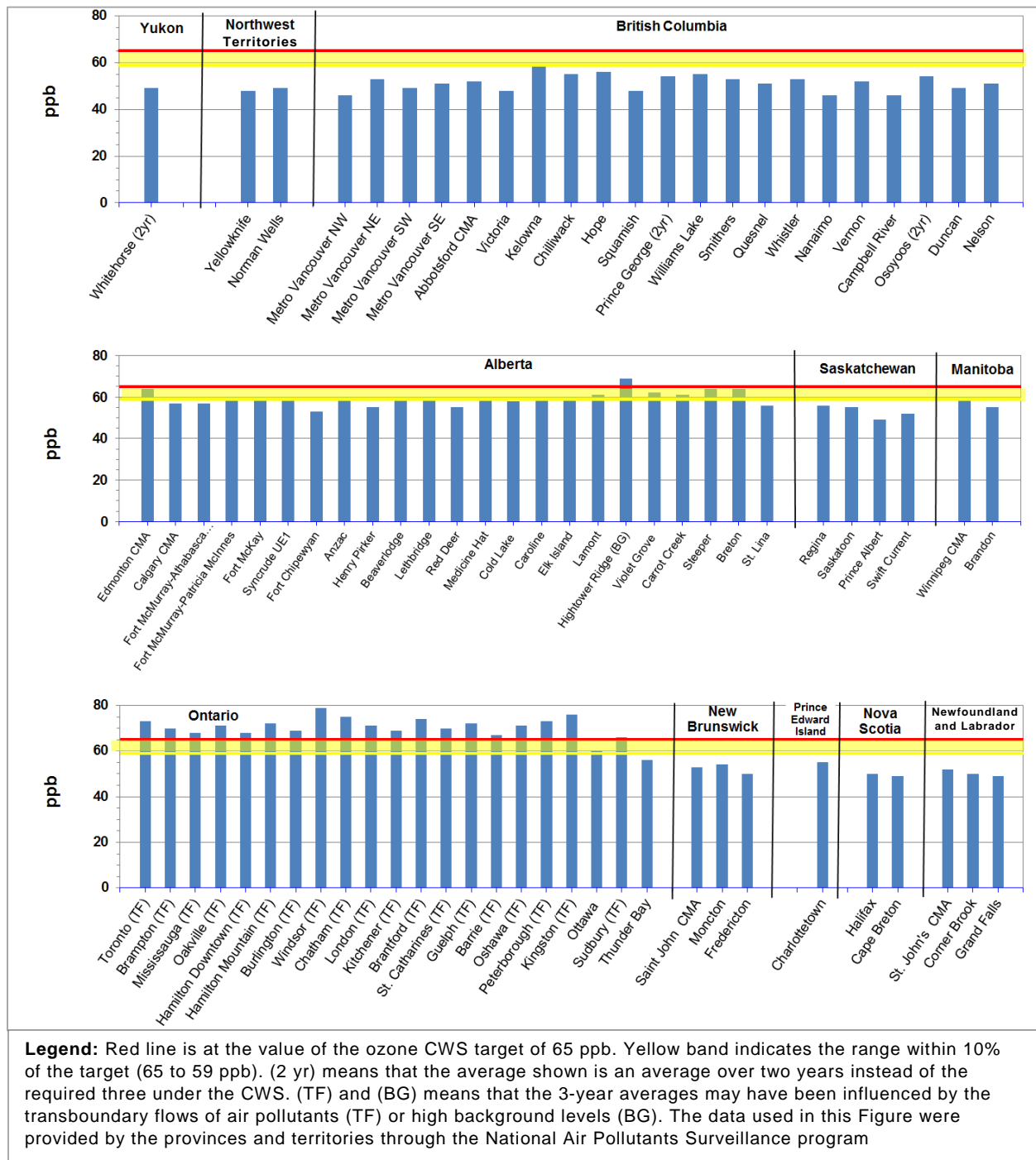
Between 2010 and 2012, approximately 28%⁸ of Canadians lived in areas with ozone concentrations above the ozone CWS target.

Figure 3: Ozone 3-year averages for reporting communities, 2010 to 2012



⁸ While Québec ozone data are not included in this report, this percentage was calculated considering both Québec's PM_{2.5} data and its population.

Figure 4: Ozone 3-year average values for reporting locations, 2010 to 2012



5. CONCLUDING OBSERVATIONS

The CWS for Particulate Matter and Ozone was established by the Canadian Council of Ministers of the Environment in June 2000 with the long-term air quality management goal “to minimize the risks of these pollutants on human health and the environment.”

This 2012 progress report demonstrates the progress that has been made towards the achievement of this goal and the CWS targets for PM_{2.5} and ozone.

Between 2001 and 2003 approximately 30% and 50% of Canadians lived in communities with PM_{2.5} and ozone levels above the CWS targets respectively⁹. This final progress report shows that between 2010 and 2012 these percentages have dropped to approximately 2% for PM_{2.5} and approximately 28% for ozone. These improvements can be attributed to the numerous measures that were implemented in Canada and in the United States since 2000 to reduce the release of particulate matter emissions and of the air pollutants that contribute to the formation of particulate matter and ozone. Information on these measures is included in the various reports that have been prepared by individual jurisdictions and CCME over the past years to meet the reporting obligations of the CWS, such as the 2010 Progress Report on the Canada-wide Standards for Particulate Matter and Ozone¹⁰. These improvements highlight the benefits of jurisdictions working collaboratively to address air quality issues.

As jurisdictions move forward with the implementation of the AQMS, further reductions in the ambient concentrations for PM_{2.5} and ozone are expected, building on the success of the CWS. The first report on the new CAAQS for PM_{2.5} and ozone will be released in 2014 and will include information for the period from 2011 to 2013.

⁹ Fine Particles and Ozone in Canada, A Canada-wide Standards Perspective, 2003 National Summary, an Environment Canada Staff Report, October 2005, available at: www.ccme.ca

¹⁰ Available at: www.ccme.ca