

Canadian Council of Ministers of the Environment

CANADA-WIDE STANDARDS

for

***PARTICULATE MATTER (PM)
and OZONE***

CANADA-WIDE STANDARDS for PARTICULATE MATTER (PM) and OZONE

These Canada-Wide Standards (CWSs) for particulate matter (PM) and ozone are established pursuant to the 1998 Canada-wide Accord on Environmental Harmonization of the Canadian Council of Ministers of the Environment (CCME) and its Canada-wide Environmental Standards Sub-Agreement.

RATIONALE

Significant adverse effects have been demonstrated for the air pollutants PM and ozone on human health and the environment.

DEFINITIONS

PM10 refers to airborne particles that are 10 microns or less in diameter

PM2.5 refers to airborne particles that are 2.5 microns or less in diameter

PM10-2.5 refers to airborne particles in the size range 2.5 to 10 microns in diameter, known as the coarse fraction of *PM10*

Ozone refers to an oxygen compound (O₃) occurring in the form of a gas in the atmosphere at ground-level

CONTEXT

The long-term air quality management goal for PM and ozone is to minimize the risks of these pollutants to human health and the environment. However, recent scientific evidence indicates that there is no apparent lower threshold for the effects of these two pollutants on human health.

These CWSs for PM and ozone are an important step towards the long-term goal of minimizing the risks they impose to human health and the environment. They represent a balance between the desire to achieve the best health and environmental protection possible in the relative near-term and the feasibility and costs of reducing the pollutant emissions that contribute to elevated levels of PM and ozone in ambient air. As such, while they will significantly reduce the effect of PM and ozone on human health and the environment, they may not be fully protective and may need to be re-visited at some future date. There are also additional benefits to reducing and maintaining ambient levels below the CWSs where possible.

Canada-wide Standards for Particulate Matter (PM) and Ozone

Uncertainty and gaps exist and new data/information that becomes available will be acknowledged. However, Ministers are confident that taking action now to reduce PM and ozone levels will improve ambient air quality and result in benefits to the environment and to human health. Jurisdictions will have considerable flexibility in the detailed design of implementation plans and sectoral emission reduction strategies over the next few years, and an opportunity to reduce information gaps and uncertainties.

In jurisdictions highly impacted by transboundary air pollution from the United States, achieving the CWSs will be strongly dependent on reductions of this transboundary contribution. Also, high background levels of PM and ozone that may occur through natural events (such as forest fires, natural formation and stratospheric intrusion) will need to be considered in assessing achievement of the CWSs.

The CWS for PM established here is for the fraction of PM recognized as having the greatest effect on human health, the fine fraction or PM_{2.5}. The PM_{2.5} CWS has been established for the interim period prior to the planned review of the standard to be completed by 2005, which will incorporate advancements in scientific, technical and economic information and analysis. The PM_{2.5} CWS will ensure that PM management efforts are focused on the sources of PM and PM precursor emissions that provide the greatest health benefit. It is acknowledged that health effects are also associated with the coarser fraction of PM, or PM_{10-2.5}, and that actions to reduce the concentrations of these coarser fractions in the atmosphere are needed. Reductions in ambient PM₁₀ levels will occur as ancillary benefits from reducing PM_{2.5}. In addition, some jurisdictions currently have ambient air quality objectives, guidelines or standards related to the coarser fraction of PM. These should continue to be used to design air quality management programs for PM₁₀. CWSs related to the coarser fraction may be a useful addition at a later date.

There are other aspects that should be considered in any future update of these PM and ozone CWSs. Forms of the PM and ozone CWSs other than the relatively short term exposure forms established here, such as seasonal or annual average targets, may also be useful additions at a later date. Since the current CWSs are related primarily to protection of human health, their adequacy for the protection of vegetation, visibility impairment, material damage or other adverse effects may need to be assessed.

PART 1:

NUMERICAL TARGETS and TIMEFRAMES

The CWS and related provisions for PM are:

A CWS for PM_{2.5} of 30 µg/m³, 24 hour averaging time, by year 2010

Achievement to be based on the 98th percentile ambient measurement annually, averaged over 3 consecutive years

The CWS and related provisions for ozone are:

A CWS of 65 ppb, 8-hour averaging time, by 2010

Achievement to be based on the 4th highest measurement annually, averaged over 3 consecutive years

Specific provisions related to transboundary flow of ozone are contained in Section B.3.5, Accounting for Transboundary Flow, of Annex B.

PART 2:

IMPLEMENTATION

Jurisdictions will undertake the following implementation actions:

Development and implementation of jurisdictional implementation plans to achieve the CWSs.

Implementation of continuous improvement, pollution prevention, and keeping-clean-areas-clean programs in areas with ambient concentrations below the CWS levels, in accordance with the guidance provided in Annex A.

In areas where jurisdictional implementation plans need to be augmented by reductions in transboundary flow of pollution from the United States or from other countries to achieve the CWSs, the federal government, with support from the provinces and territories, will aggressively pursue further reductions in the transboundary flow into Canada of PM and ozone and their precursor pollutants.

Establishment and maintenance of the PM and ozone monitoring networks needed to characterise the PM and ozone air quality problems across Canada, design management programs, and track progress.

REVIEW

The CWSs will be reviewed as follows:

- (a) by the end of year 2005, complete additional scientific, technical and economic analysis to reduce information gaps and uncertainties and revise or supplement the PM and ozone CWSs as appropriate for year 2015; and report to Ministers in 2003 on the findings of the PM and ozone environmental and health science, including a recommendation on a PM_{10-2.5} CWS.
- (b) by the end of year 2010, assess the need, and if appropriate, revise the CWSs for PM and ozone for target years beyond 2015.

REPORTING on PROGRESS

Progress towards meeting the above provisions will be reported as follows:

- (a) to the respective publics of each jurisdiction on a regular basis, the timing and scope of reporting to be determined by each jurisdiction
- (b) to Ministers and the public, with comprehensive reports at five year intervals beginning in year 2006 and reports on achievement and maintenance of the CWSs annually beginning in 2011, in accordance with guidance provided in Annex B

ADMINISTRATION

Jurisdictions will review and renew Part 2 and Annexes A and B five years from coming into effect.

Any party may withdraw from these Canada-Wide Standards upon three month's notice.

These Canada-Wide Standards come into effect for each jurisdiction on the date of signature by the jurisdiction.

ANNEX A

GUIDANCE FOR CONTINUOUS IMPROVEMENT AND KEEPING-CLEAN-AREAS-CLEAN PROGRAMS FOR PM AND OZONE

In most areas of Canada, ambient levels are lower than the CWSs for PM and ozone established here. Ministers have agreed to include in the CWSs a provision on environmental management in areas where ambient air quality is “better” than the levels set out in the standards.

(a) Continuous Improvement

There are numerous locations across Canada that have ambient levels of PM and/or ozone below the CWS levels but still above the levels associated with observable health effects. There is a need to ensure that the public recognizes that the CWS levels are only a first step to subsequent reductions towards the lowest observable effects levels. It would be wrong to convey the impression that no action is required in these areas or that it would be acceptable to allow pollutant levels to rise to the CWS levels. Jurisdictions should take remedial and preventative actions to reduce emissions from anthropogenic sources in these areas to the extent practicable.

(b) Keeping Clean Areas Clean

Jurisdictions recognize that polluting “up to a limit” is not acceptable and that the best strategy to avoid future problems is keeping clean areas clean. Jurisdictions should work with their stakeholders and the public to establish programs that apply pollution prevention and best management practices, by, for example:

- developing and implementing strategies consistent with the CCME commitment to pollution prevention
- ensuring that new facilities and activities incorporate the best available economically feasible technologies to reduce PM and ozone levels
- requiring that upgrades carried out in the course of normal capital stock turnover incorporate the best available economically feasible technologies to reduce PM and ozone levels
- reviewing new activities that could contribute to an increase in PM and ozone levels with stakeholders and the public in terms of their social, economic and environmental merits

ANNEX B

REPORTING PROTOCOL FOR CANADA-WIDE STANDARDS FOR PARTICULATE AND OZONE

B.1 Introduction

It is intended under the Harmonization Accord and its Standards Sub-Agreement that all jurisdictions will report on a regular basis to their publics and to Ministers of the Canadian Council of Ministers of the Environment on their progress towards achieving the CWSs for particulate matter (PM) and ozone.

This reporting protocol is intended to provide guidance for reporting on all provisions of the CWSs for PM and ozone. Its provisions are designed to help ensure consistency and comparability in the reporting by jurisdictions, and better understanding by the public on how jurisdictions plan to track and report on progress.

B.2 Frequency, Timing and Scope of Reporting

There will be two types of reporting by jurisdictions:

1) Annual Reporting on Achievement of the CWSs

These reports will be completed by each jurisdiction in a standardized “report card” format, the format to be developed and agreed to by all jurisdictions, and provided to Ministers and the public by 30 September of each year, beginning in 2011. These annual reports will be limited in scope containing mainly summary information on levels and trends in ambient PM and ozone concentrations in communities within each jurisdiction, identifying communities where ambient levels are exceeding or approaching the CWS levels. They may also note the reason for any significant change in ambient levels or trends from previous years.

2) Five-Year Reports

These reports will be completed for the year 2005 and for every fifth year thereafter and provided to Ministers and the public by 30 September of the following year. The report for 2005 will be an interim report on progress towards meeting the CWSs, and subsequent reports will focus on achievement of the CWSs applicable at that time.

Five-year reports will be comprehensive, assessing progress on all provisions of the CWSs. The format and general content will be determined and agreed to by all jurisdictions 2 years in advance of the reporting year. They will include, assessment of ambient levels and trends in communities within each jurisdiction, identifying communities

Canada-wide Standards for Particulate Matter (PM) and Ozone

where ambient levels are exceeding or approaching the CWS levels, information on PM and ozone precursor emissions and trends, comprehensive descriptions of smog management efforts, progress with implementation of measures in implementation plans, actions to ensure continuous improvement in areas with ambient levels below the CWS levels but within the effects range, actions to ensure that clean areas are kept clean, actions on co-operation in monitoring and science, and any other provision of the CWSs. The federal government will include in its reports an assessment of trends in U.S. emissions and ambient levels in border regions affecting ambient PM and ozone levels in Canada, and of the effectiveness of U.S. control programs in reducing those emissions and of Canadian efforts to secure such reductions.

The CCME will co-ordinate the collation of the information from the various jurisdictional reports in (1) and (2) above into a national overview report for the public, CCME Ministers and international audiences.

In addition to the reporting in (1) and (2) above, individual jurisdictions may report to their publics on a more frequent basis. The scope and timing of any such reporting would be determined by the jurisdiction.

B.3 Reporting on Achievement of the CWSs

B.3.1 Guidance Document on Achievement Determination

Jurisdictions will co-operate in the preparation and periodic update as required, of a Guidance Document on Achievement Determination for the PM and ozone CWSs. This document will elaborate on information, methodologies, criteria and procedures related to each of the basic elements of achievement reporting identified below.

B.3.2 Communities for CWS Achievement Determination

Jurisdictions will use a community-oriented approach for reporting on achievement of the PM and ozone CWSs. As a basic requirement, jurisdictions will report on CWS achievement for population centres over 100,000. As well, jurisdictions may also report on CWS achievement for communities with population less than 100,000 based on considerations such as regional population density, proximity to sources, local air quality, etc.

To provide consistency and comparability in reporting across jurisdictions, the geographic units for grouping of municipalities (Census Metropolitan Areas (CMAs)/Census Agglomerations (CAs)/Census Subdivisions) established by Statistics Canada will be used as guidance for community identification. Larger CMAs may be subdivided into smaller sub-areas to better capture geographic variation within the CMA. [*refer to the **Guidance Document** for a listing of CMAs and CAs in Canada and suggested criteria for subdividing larger CMAs.*]]

B.3.3 Monitoring Sites for Determining Achievement

CWS achievement will be based on community-oriented monitoring sites i.e. sites located where people live, work and play rather than at the expected maximum impact point for specific emission sources. Rural (or background) and source specific sites will not be included for CWS achievement determination. [See the **Guidance Document** for guidance on selection of community-oriented monitoring sites].

B.3.4 Calculation Methodologies for Determining Achievement

It is important that common statistical parameters be used by all jurisdictions in reporting on CWS achievement so that there will be consistency and comparability in assessing progress in achieving the CWSs. These parameters stem initially from the basic form and achievement statistics specified for the CWSs. That is:

For PM_{2.5}:

24-hour averaging time, achievement to be based on 98th percentile annual value, averaged over three consecutive years

For Ozone:

8-hour averaging time, achievement to be based on 4th highest annual measurement, averaged over three consecutive years

For PM CWS achievement determination, measurements from each multiple continuous (or daily) population-oriented monitoring station within a CMA/CA or CMA reporting sub-area will be spatially averaged for each year (up to three) for which measurements are available.

For ozone CWS achievement determination, the monitoring station with the highest average ozone concentration within a CMA/CA or CMA reporting sub-area will be used.

*[See the **Guidance Document** for methodology for determination of 98th percentile annual levels for PM_{2.5} and 4th highest annual levels for ozone from monitors that measure at various frequencies or for which there are less than 365 measurements per year, and methodologies for determining spatial averages]*

B.3.5 Accounting for Transboundary Pollution

Communities for which jurisdictions demonstrate (i) that continued exceedance of the CWS levels is primarily due to transboundary flow of PM and ozone or their precursor pollutants from the U.S. or from another province/territory, and (ii) that “best efforts” have been made to reduce contributions to the excess levels from pollution sources within the jurisdiction, will be identified in reporting as “transboundary influenced

Canada-wide Standards for Particulate Matter (PM) and Ozone

communities” that are unable to reach attainment of the CWSs until further reduction in transboundary air pollution flow occurs. Demonstration of transboundary flow influence will be a shared responsibility of the federal government and the affected province/territory, and demonstration of best efforts will include measures in both provincial/territorial and federal implementation plans. *[See the **Guidance Document** for methodologies for demonstrating the influence of transboundary and criteria on what would constitute “best efforts”]*

For the province of Ontario, a 45% reduction in NO_x and VOC emissions from 1990 levels by 2010 or earlier, subject to successful negotiations this fall with the U.S. for equivalent reductions, will be considered the province’s appropriate level of effort towards achieving the ozone CWS. Any remaining ambient ozone levels above the CWS in Ontario will be considered attributable to the transboundary flow from the U.S. of ozone and its precursor pollutants.

B.3.6 Accounting for Background and Natural Events

Communities for which jurisdictions demonstrate (i) that continued exceedance of the CWS levels is primarily due to naturally occurring local or regional PM and/or ozone and (ii) that “best efforts” have been made to reduce contributions to the excess levels from pollution sources within the jurisdiction, will be identified in reporting as “communities influenced by background or natural events”. Demonstration of background or natural influence is the responsibility of the affected jurisdiction, and demonstration of best efforts will include measures in both provincial/territorial and federal implementation plans. *[See the **Guidance Document** for methodologies for demonstrating background or natural influence and criteria on what would constitute “best efforts”]*

B.3.7 Maintenance and Provision of Monitoring Information

It is important to have up-to-date PM and ozone monitoring data. Jurisdictions will maintain their own data on ambient measurements of PM_{2.5}, PM₁₀ and ozone and make it publicly accessible. Accessibility may be accomplished by posting on Internet Sites, which would be linked to the CCME Website.

Jurisdictions will also co-operate in establishing and maintaining a **Monitoring Protocol**, which will ensure the coordination of monitoring data. This will allow for better co-ordination of monitoring program design and operation, ambient air quality trends analyses, regional source-receptor assessments, transboundary air quality analyses and implementation plan design.

Canada-wide Standards for Particulate Matter (PM) and Ozone

Signed by:

British Columbia	Honourable Joan Sawicki
Alberta	Honourable Halvar Johnson
Saskatchewan	Honourable Buckley Belanger
Manitoba	Honourable Oscar Lathlin
Ontario	Honourable Dan Newman
Environment Canada	Honourable David Anderson
New Brunswick	Honourable Kim Jardine
Nova Scotia	Honourable Michael Baker
Prince Edward Island	Honourable Kevin MacAdam
Newfoundland and Labrador	Honourable Oliver Langdon Honourable Walter Noel
Yukon	Honourable Dale Eftoda
Northwest Territories	Honourable Joseph Handley
Nunavut	Honourable Peter Kilabuk

Note: Québec has not endorsed the Canada-wide Accord on Environmental Harmonization or the Canada-wide Environmental Standards Sub-agreement.