

ACETALDEHYDE

Comments on the **environmental sections** of the CEPA PSL Draft Assessment Report on Acetaldehyde were provided by:

1. Canadian Chemical Producers' Association - submitted on behalf of Canadian Chemical Producers' Association and the Industry Coordinating Group for CEPA
2. Canadian Manufacturers of Chemical Specialties Association
3. Vehicle Environmental and Energy Programs, DaimlerChrysler Canada Inc.
4. Environment, Health and Safety, Canadian Vehicle Manufacturers' Association

Comments and responses are summarized below by Environment Canada. (All were based on the English version of the report).

Comment ^(source)	Response
<p>The Assessment Report and its summary on the web site are unclear as to whether the basis for concluding that acetaldehyde is toxic under CEPA section 64 is based on considerations of danger to human life or health (CEPA 64(c)) only or if it is based on considerations of both dangers to human life or health (CEPA 64(c)) and dangers to the environment on which life depends (CEPA 64(b)). (1) (2)</p>	<p>The text of the Assessment Report has been modified to indicate explicitly that the basis for concluding that acetaldehyde is toxic under CEPA section 64 is based on considerations of both dangers to human life or health (CEPA 64(c)) and dangers to the environment on which life depends (CEPA 64(b)).</p>
<p>The approach used to assess the contribution of acetaldehyde to ground-level ozone formation is not consistent with that described in the Environment Canada Guidance Manual for Environmental Assessments of Priority Substances (March 1997). The criteria for concluding whether acetaldehyde is CEPA-toxic under Paragraph 64(b) should be explicitly stated. Without such criteria, industry is not in a position to accept or challenge the conclusion of CEPA-toxic under Paragraph 64(b). Environment Canada should not operate to guidelines that differ from those published without a) alerting affected stakeholders of their intent to do so and b) engaging those stakeholders in a full review and the appropriate update of the guidelines prior to implementation. (1) (2)</p>	<p>As noted in the Environment Canada Guidance Manual for Environmental Assessments of Priority Substances (March 1997), "the manual is intended to provide guidance only, not strict rules, to allow for the flexibility required to assess different types of substances and for developments in experience and science." Since the preparation of the Guidance Manual, understanding of reactions leading to the formation of ground-level ozone has continued to progress, as have databases of concentrations of volatile organic compounds in Canada, allowing the estimation of relative contributions of such compounds to ozone formation. The text of the Assessment Report has been revised to provide a discussion of the reactivity of acetaldehyde which leads to its contribution to ozone formation, followed by a presentation of the relative importance of</p>

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	<p>acetaldehyde to this process in Canada.</p> <p>Given the many on-going refinements to the assessment process for priority substances under both Paragraphs 64(a) and 64(b), stakeholders will be engaged to review and discuss all these assessment approaches after the current round of PSL2 assessments.</p>
<p>The report should present a more detailed accounting of acetaldehyde emissions from all sources.^{(3) (4)}</p>	<p>The published Assessment Report provides only a broad overview of releases of acetaldehyde. More detailed information is provided in the unpublished supporting document; however, given considerable uncertainties in deriving these estimates, they are not reported in the Assessment Report. The Assessment Report recognizes that there is considerable uncertainty in calculating estimates of releases or formation of acetaldehyde. Nonetheless, highest concentrations of acetaldehyde in Canada have been measured in industrial areas which have been associated with high releases of acetaldehyde, or urban areas known to be associated with high releases of acetaldehyde and other volatile organic compounds from automotive and other sources. Since reductions in ambient concentrations of acetaldehyde may depend on a balance of reductions of both the releases of acetaldehyde and of volatile organic compounds contributing to secondary formation, this issue has been referred to risk managers for consideration.</p>
<p>The Assessment Report puts undue emphasis on on-road vehicles and fails to mention that the NPRI information has been derived by modelling.⁽⁴⁾</p>	<p>The text of the Assessment Report has been modified to indicate that data were obtained through modelling.</p>
<p>The vehicle inventory data presented in the report represents emission estimates from earlier technology controls. Current Tier 1 control technology and adoption of the U.S. EPA National Low Emission Vehicle program vehicle emission requirements would result in reductions in emissions of VOCs including acetaldehyde. Changes in gasoline quality, such as reductions in</p>	<p>While the supporting document provides much discussion of emission rates based on consideration of vehicle technology and gasoline composition, the public Assessment Report simply provides an overall estimate of releases from on-road vehicles, as calculated by the National Pollutants Release Inventory. Given the complexity of this issue, it is not proposed that it</p>

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<p>sulphur, would also result in lower emissions of acetaldehyde. Use of gasoline blended with ethanol would result in higher emissions of acetaldehyde; while use of ethanol appears to be an effective strategy in reducing greenhouse gas emissions, actions to reduce acetaldehyde may be in direct conflict with an emerging strategy to help address greenhouse gas emissions. All data should be reassessed to reflect more current information, including using emission factors based on the latest technologies (1999/2000 model vehicles).^{(3) (4)}</p>	<p>be dealt with in the Assessment Report. A statement has been added to the Assessment Report noting that the estimates are based on modelling and that current and planned changes to emission technology equipment and gasoline formulation will affect emissions.</p> <p>Environment Canada recognizes the importance of evolving control technologies and gasoline composition with regards to emissions and to any possible risk management actions, and looks forward to continued input and discussions with the automotive industry. Potential changes in emissions of acetaldehyde from vehicles must be discussed in the context of reductions of all VOCs and other pollutants from such sources. This matter will be referred to risk managers for further consideration.</p>
<p>The Assessment Report states that there were no Canadian data for off-road motor vehicle sources and utility equipment powered by internal combustion engines; however, the unpublished supporting document gives a range of acetaldehyde emission performance for vehicles of various emission control technologies, including some similar to off-road use. This suggests that for internal combustion sources, the inventory has excluded a possible major portion from the off-road sector.^{(3) (4)}</p>	<p>Section 2.2.2.2 of the Assessment Report recognizes that all internal combustion engines can produce acetaldehyde. However, reliable estimates are not available for total emissions from off-road vehicles and equipment in Canada. A statement has been added to the report, noting that while quantitative estimates are not available for off-road engine sources, these do contribute to the release of acetaldehyde. This matter has been referred to risk managers for further consideration.</p>
<p>For the characterization of risks to terrestrial organisms exposed to acetaldehyde in air, the hyperconservative quotient uses an Estimated Exposure Value of 1150 µg/m³, which is the highest outdoor ambient concentration recorded in Canada. A similar calculation should also be provided for a range of concentrations down to the typical ambient level of 2 µg/m³.^{(3) (4)}</p>	<p>As described in Section 3.1 of the Assessment Report, if a hyperconservative quotient is less than 1, it can safely be assumed that the substance does not pose a significant risk for that assessment endpoint, and there is no need to pursue the analysis further. Since acetaldehyde was determined not to pose a significant risk to terrestrial biota even when considering the highest concentrations likely encountered in ambient air in Canada, exposure to lower concentrations will obviously pose a lower risk. The current text was not revised.</p>

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Comments on the **health-related sections** of the CEPA PSL Assessment Report on Acetaldehyde were provided within the comment period by:

- DaimlerChrysler Canada Inc.

Comment	Response
<p>The magnitude of the differences between typical environmental exposures to acetaldehyde and the concentrations used in animal studies, and levels at which irritation may be observed in humans, should be discussed.</p>	<p>In the Risk Characterization section of the report, the variation between estimated exposure of the general population and both carcinogenic potency and non-cancer effects observed in animals is discussed in some detail. Data in humans are restricted to a few very early clinical studies of sensory irritation and an epidemiological study of carcinogenicity considered to be inadequate; as indicated in the report, these studies are not considered to provide reliable characterization of exposure-response.</p>