Summary of public comments received on Liquefied Petroleum Gases (Stream 4 Petroleum and Refinery Gases) (CAS RNs 68476-85-7, 68476-86-8) Draft Screening Assessment and Risk Management Scope

Comments on the draft screening assessment of Liquefied Petroleum Gases (LPGs/Stream 4 Petroleum and Refinery Gases) and the risk management scope document under the Petroleum Sector Stream Approach (PSSA) of the Chemicals Management Plan were provided by Dundee Energy LP, Superior Propane, Canadian Propane Association, Canadian Fuels Association, Canadian Association of Petroleum Producers, Shell Canada Limited, and Dow Chemical Canada Inc.

Summarized comments submitted during the 60 day public comment period [1] and responses are included below, and organized by topic:

Topic	Condensed Comment	Condensed Response
Scope of the Assessment	Are CAS RN 74-98-6 and commercial grade propane included in this assessment?	CAS RN 74-98-6 which represents pure "propane" has not yet been addressed under the Chemicals Management Plan (CMP). If commercial grade propane consists of solely propane and is identified under CAS RN 74-98-6, it will be assessed moving forward. The current assessment is on the mixture that fits the description in the Substance Identity, Physical and Chemical Properties, and Uses sections of the report.

[1]Some comments were previously submitted for Stream 1 and Stream 2 PRGs and re-submitted again for Stream 4 LPGs. Also, some comments were not submitted to the Program Development and Engagement Division but to the Regulatory Innovation and Management Systems Division of Environmental Stewardship Branch at Environment and Climate Change Canada.

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	Is there a difference between CAS RNs 68476-85-7, 68476-86-8 and LPGs transported under UN 1075 or UN1978?	LPGs transported under UN 1075 or UN1978 are covered in this assessment, providing that the substances being transported meets the description in sections of Substance Identity, Physical and Chemical Properties, and Uses of the report.
	Should LPGs be considered a VOC issue and not a substance toxicity issue?	The substances in this assessment are on the Domestic Substance List (DSL) and met categorization criteria. As such, under sections 73 and 74 of CEPA 1999, the Government of Canada is mandated to conduct a screening level assessment.
Methodology	An alternative methodology should be derived to integrate multiple components for assessing the toxicity of LPGs as a whole for CAS RNs 68476-85-7 and 68476-86-8.	A high hazard constituent approach was adopted based on a number of considerations, including data availability for individual constituents and information on the substance itself, that is LPG. 1,3-Butadiene has been identified to be potentially present in these two CAS RNs. It is considered to be carcinogenic and genotoxic, and a high-hazard component of LPGs and other petroleum and refinery gases (PRGs). Toxicological information for other potential components was examined and is provided in the assessment. LPGs are UVCBs and toxicological effects data on these whole substances are limited.
	It is not appropriate to assign all 1,3-butadiene to the LPGs. The Screening Assessment Report (SAR) should reflect that a representative portion of the 1,3-butadiene is presented in LPGs.	The assessment states that these two LPGs (CAS RNs 68476-85-7, 68476-86-8) are a portion of total PRGs and 1,3-butadiene generated from petroleum facilities.

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	SCREEN 3 modelling is out of date. Other models such as AERSCREEN and AERMOD should be used for further refinement.	SCREEN3 is still used by the U.S. EPA for ambient air modelling in the "Exposure and Fate Assessment Screening Tool" version 2014. In the absence of empirical data, it is considered an appropriate model for use in conduct of screening assessment under CEPA 1999. Additionally, modelling using AERSCREEN has been conducted between the draft and final assessment and provides estimates similar to or higher than those derived by SCREEN3.
	Provide a rationale to explain why the margin of exposure (MOE) of 5300 was not deemed acceptable in the assessment of LPGs, but can be acceptable in other CMP assessments.	A rationale for determining the potential inadequacy of the MOE is stated in the Risk Characterization Section of the assessment report.
	The DIAL studies were controversial. Use caution in referencing DIAL results without further validation and/or confirmation.	Noted. DIAL technology has been used in several countries (AWE 2014) and is referenced as one of the best available methods for quantitative on-site monitoring of benzene in refineries and storage facilities (European Commission - EIPPCB 2003, 2006). DIAL measurements are considered reliable estimations and are used to assess fugitive emissions in European refineries. DIAL is accepted by the US EPA (CONCAWE 2008; US EPA 2006, 2010) and used by NASA (Young 2012). DIAL measurements reported by Chamber et al. (2008) were referenced for air monitoring data at Canadian refineries.
	**[2] A SCREEN3 modelling assumption is very conservative for predicting 1,3-butadiene concentrations and indicates ratios will not exceed 0.1%.	Conservative values are used as inputs to the dispersion model to estimate the potential for exposure to the environment and general population of Canada. Uncertainty with respect to the exposure database is captured and communicated in the assessment and a model sensitivity analysis was included. Estimates about the nature of releases were derived from models and uniform release leading to long-term exposure was assumed.

[2] **The double asterisks mark repeated comments that were submitted previously to Stream 1 PRGs (draft SAR, final SAR) and Stream 2 PRGs (final SAR).

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Uses, Releases, and Fugitive Emissions	In the chapter "Releases to the Environment", modelling of other LPG components in lieu of, or in addition to 1,3-butadiene should be conducted to strengthen the conclusions.	Monitoring data for other LPG components are not available at the distances used for modelling potential exposures in the assessment report (i.e., 50 to 2000 m in the vicinity of facilities). 1,3-Butadiene was chosen to represent the highest health concern for long-term exposure to LPGs, as it has been identified to be potentially present in LPGs, and is considered to be carcinogenic and genotoxic.
	Can LPGs be assessed as a fuel under PSSA Stream 3?	Exposure to fuel-related use was considered in the assessment report. In addition, LPGs are used in consumer and commercial aerosol products as propellants and, therefore, have been assessed under PSSA Stream 4.
	Recognize industry's efforts on emission control and provide a balanced perspective. As such, the various appearances of the statement on the occurrence of fugitive releases should be deleted.	The assessment report recognizes the existence of regulatory and non-regulatory tools for emission control in the petroleum industry. The risk management scope also notes voluntary initiatives undertaken by industry.

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	** The ratio of butadiene (gas) to benzene (liquid) may not be appropriate.	No Quantitative data on emissions of 1,3-butadiene from Canadian petroleum facilities were identified to validate this ratio. Emissions rates for 1,3-butadiene were derived by calculating ratios of facility wide benzene to 1,3-butadiene emissions, and applying those ratios to the measured emissions rate of benzene from a Canadian refinery. Benzene emissions were used to represent a measure of substance throughput in refinery facilities. Two ratios of benzene to 1,3-butadiene were derived from established emissions inventories, specifically the Canadian National Pollutant Release Inventory (NPRI) and the US EPA's Toxics Release Inventory (TRI) which were submitted to authorities by industry. The TRI database contains data from 65 US refineries and was used to expand the dataset, increasing confidence in the numbers presented. As such, a range of derived emissions rates based on available data and associated variations were used to present conservative estimates for potential releases of fugitive emissions.
	Continuous improvement and reduction in VOC emissions, including 1, 3-butadiene emissions, have been demonstrated. Recent community monitoring data confirm significant reduction of butadiene concentrations to well below the US cancer risk specific threshold (0.3 µg/m$^{3)}$. Therefore, the two LPGs should be considered "Not-Toxic" in the CEPA context.	Industry action on emission control and reduction via regulatory and non-regulatory tools have been recognized in the assessment report. The risk characterization is based on the potential fugitive release of 1,3-butadiene present in LPGs at petroleum facilities, and not concentrations that may be found at greater distances.
	** Two recent studies on air monitoring at community level by Fraser Health Update Study and Sarnia Lambton Environment Association, indicate a significant reduction in butadiene, as well as significant reduction in VOC based on recent NPRI data.	These two studies have been reviewed. However, there are a variety of recent reports with varying conclusions on this subject, for example, Simpson et al. (2013) indicated an increase in concentrations of volatile components in the ambient air near Canadian petroleum facilities.

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Data & Information Gaps	Under "Substance Identity", the CMP assessment on ethene should be referenced.	The ethene SAR is now referenced in this report, but only to acknowledge that releases of ethene from the petroleum sector have been addressed in a separate assessment.
	Re-phrase the first paragraph under "Sources" to identify how various treatment activities on crude oils can produce LPGs.	The first paragraph under "Sources" has been updated.
	In the third paragraph under "Sources" change wording from "However, these data may not be specific to the two CAS RNs identified in this screening assessment report." to "However, these data will not be specific to the two CAS RNs identified in this screening assessment report"	Wording retained as need to reflect variability and uncertainty in definitions of these substances from different sources and natural variability of UVCBs.
	Consider the data submitted in 2014 as lines of evidence to confirm the low level of 1,3-butadiene in natural gas processing facilities, and update the draft SAR conclusion accordingly.	The submitted data from industry, in combination with other lines of evidence, were reviewed and the final screening assessment report was updated to reflect new information (in the Sections of Synopsis and Potential to Cause Harm to Human Health).

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	The Government of Canada should confirm the presence and, if present, determine a truly representative concentration for 1,3-butadiene in Canadian LPGs.	The Government of Canada has solicited compositional data on PRGs from industry stakeholders; including levels of 1,3-butadiene that may be present. Data relevant to the upstream natural gas processing industry were recently received and the SAR was updated based on this information. For petroleum refineries and upgraders, modelling was used to estimate the potential risks of exposure to PRGs and LPGs for general populations living in the vicinity of these facilities based on the emission study by Chambers et al. (2008). The study by Chambers et al. (2008) was the only source of measured data on emission rate for a Canadian refinery and was applied directly to modelling of the assessment in the absence of detailed air monitoring data near Canadian refineries.
	** Dispersion modelling and assumptions are very conservative and are not supported using data on actual emissions.	The dispersion screening model used in the assessment is not meant to incorporate detailed chemical information or information from specific sites; rather it gives a conservative estimate of exposure to individuals living in the vicinity of facilities. Additionally, AERSCREEN modelling has provided estimates similar to or higher than those from SCREEN3. The potential for fugitive releases of volatile organics from petroleum facilities is supported in Simpson et al. 2013, which indicates an increase in the levels of 1,3-butadiene near Canadian petroleum facilities.

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	** American Petroleum Institute (API) high production volume (HPV) category assessment indicated 83% of HPV PRGs do not contain 1,3-butadiene. ** EU only classified PRGs as carcinogenic if they contain >0.1% butadiene.	This API category report has been reviewed and referenced in Stream 1 and Stream 2 PRGs assessments. It was considered during the determination of the potential for presence of 1,3-butadiene in PRGs. According to this report, 19 out of 44 CAS RNs assessed in Stream 1 and Stream 2 PRGs have been identified to potentially contain 1,3-butadiene of up to 4% by weight, however, the limit of detection was not reported. The absence of specific information regarding the composition of the PRGs from Canadian refineries and upgraders led to the assumption that all the PRGs produced by these facilities could contain 1,3-butadiene. This assumption is captured and communicated in the assessment.
Conclusion		
	Environment and Climate Change Canada is encouraged to examine the potential unintended consequences of a toxic conclusion regarding scenarios for which the assessment did not identify any unacceptable risk (e.g., real or perceived concern in either the regulated community or the marketplace) and take actions to mitigate these consequences.	The assessment report clearly identifies the exposure scenario of concern as well as exposure scenarios that are not of concern. The risk management scope and the risk management objective outlined within it make it clear where risk management actions will be focussed.
	In conjunction with the final assessment outcome, we urge the government to promote sustainability.	Noted. Sustainable development is one of the guiding principles of CEPA 1999. The Government of Canada's environmental protection strategies are driven by a vision of environmentally sustainable economic development.
Risk Management Scope		

	** For substances under the CMP that require risk management, the Government of Canada should allow facilities the option to confirm risk (e.g., via site-specific data or refined modelling) prior to implementing risk management measures.	The development of a risk management measure is carried out using a thorough and consistent approach that considers information from the final screening assessment report and other information sources including stakeholder input. It would not be feasible or desirable from a public policy perspective to develop risk management measures based on the specific operations of a single facility. This approach would also not create a level playing field.
	An effective and enforceable risk management instrument to address VOC emission reductions should be developed through a single initiative.	A single initiative to address all PRGs including LPGs is proposed. The risk management action anticipated for LPGs is the same regulation under CEPA 1999 that is being considered for the risk management of Stream 1 and Stream 2 PRGs, for which the final SARs have been published.
	Any future plans to manage VOCs should be compared with results achieved under existing voluntary measures such as industry codes of practice.	The regulation will focus on additional practices and technologies, or the improved implementation of existing requirements, for reducing fugitive emissions from petroleum facilities.
	Environment and Climate Change Canada is encouraged to explore alternatives to regulations to risk manage fugitive air emissions from petroleum facilities.	The selection of the most appropriate tool for risk management of a substance is made using a thorough, consistent and efficient approach that takes into consideration information received from both the assessment and other sources (e.g., consultations). In the case of LPGs, the analysis of options indicated that a regulation was the most appropriate tool.

	Environment and Climate Change Canada is encouraged to consult broadly (beyond the petroleum industry) on any fugitive emissions management control instrument. If industries outside the petroleum sector are not consulted, they should be explicitly excluded from the instrument. The instrument must have the support of both the federal and provincial governments and involve meaningful engagement and input from the affected industries.	Consultation with stakeholders is an essential part of the risk management process. The proposed risk management action will involve consultation with stakeholders including implicated federal, provincial and other regulatory agencies.