ALLIANCE FOR THE SAFE MANAGEMENT OF HAZARDOUS SUBSTANCES

A.S.M.H.S.

Final version for publication

28/03/2014

Recommendations for the safe management of hazardous substances

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About the Alliance for the safe management of hazardous substances

The ASCQ, MIARC and Reco-Québec (see appendix 2 for more detailed information about these 3 associations) have jointly decided to create the *Alliance for the safe management of hazardous substances*. This alliance is not per say an organization but a trend of opinion to which other associations, enterprises or organizations are free to adhere. By adhering to the alliance, the partners:

1. Essentially support the recommendations contained in this document (some reservations can be highlighted for future resolution);
2. Signify their participation via a letter addressed to the President of the ASCQ (see appendix 2 for contact information), which has accepted to act as the official contact organization for the alliance;
3. Agree that their participation will be mentioned publicly in the document and/or on the Web sites of the founding organizations and that their logo (if available) will be posted with those of the other partner associations;

4. Actively support the implementation of the recommendations in their field of action by the usual means available to them;
5. Promote with regulators the implementation of the recommendations suggested in this document.

The associations, enterprises and organizations mentioned in appendix 3 have been solicited for participation in the Alliance.

Executive summary

On July 6th 2013, the Lac Mégantic tragedy brought public attention to the presence of hazardous substances in their community and the hazards associated with their presence. The public is concerned and many have rightly requested better controls and regulations. These substances are however key to our current lifestyle and their complete elimination is impossible in a foreseeable future. Given this situation, the ASCQ, MIARC and RECO-Québec have put together an alliance to propose recommendations that would significantly improve public and employee safety as well as protecting the environment.

A summary of these recommendations is listed in the following table, together with the organisations that we consider responsible for their implementation (the province of Quebec governmental organisations are listed where provincial attention is deemed required). A full description of each recommendation appears in the body of the document. A list of the acronyms used to simplify the text appears in appendix 1, at the end of this document.

Number	Recommendation	Organizations responsible for implementation	Details
1	Use safe technologies.	Environment Canada	Include in particular in the environmental emergencies (E2) regulation.
		NEB	Include in standard CSA Z662 (2011) to which oil and gas pipeline operators must comply.
		MDDEFP	Include in the provincial act on the quality of the environment and its associated regulations.
		Régie du bâtiment du Québec	Include in the building law, the safety code and in the law on petroleum products.
		CSST	Include in the worker safety law and associated regulations.
		Transport Canada	Include in the TDG laws and regulations.

Number	Recommendation	Organizations responsible for implementation	Details
2	Revise the list of threshold quantities in the E2 regulation to ensure that installations having a potential off-site impact are covered.	Environment Canada	Ammonia and chlorine are two such substances.
3	Implement a risk management system.	Same as for recommendation no.1	Include the creation and implementation of performance indicators.
4	Apply land-use planning guidelines.	MSP	Include in the public safety law (LSC).
		MAMROT	Include in the law on land-use planning (LAU).
		MRC and municipalities	Include in zoning and land-use planning by-laws.
5	Create joint emergency response plans with local authorities and reinforce emergency response capabilities.	Environment Canada	Reinforce the existing requirements in the environmental emergencies regulation, focussing on coordination at the local level and emergency response capabilities.
		Transport Canada	Reinforce the existing requirements in the TDG regulation, focussing on coordination at the local level and emergency response capabilities.
		NEB	Include in the regulations pertaining to pipelines.
		MSP	Include in the public safety law, for municipalities and installations where hazardous substances are present.

Number	Recommendation	Organizations responsible for implementation	Details
6	Reinforce local information sharing and coordination.	MSP, MRC, MSSS, ASSS and municipalities	Create and support local emergency planning committees (LEPC's), with citizens' participation.
7	Reinforce the inspection capabilities by governmental authorities.	Federal, provincial and municipal governments and their respective agencies.	Ensure that a sufficient number of well-trained inspectors are present and that they have the power to implement their laws and regulations.
8	Reinforce organizations and directors/managers accountability.	Federal, provincial and municipal governments and their respective agencies.	Existing dispositions in civil, penal and criminal laws should be reinforced to discourage inappropriate decision making processes.
9	Harmonise laws and regulations.	Federal, provincial and municipal governments and their respective agencies.	Existing and forthcoming laws and regulation must be better coordinated.
10	Provide risk management training for professionals and citizens.	Education and professional organizations.	Competencies in risk management of hazardous substances must be improved, especially for engineers.

It is interesting to note that several of the above mentioned recommendations have found some support in chapter 6 of the November 2013 report of the *Vérificateur général du Québec* (auditor general) and in section V of the *Vérificateur général de la Ville de Montréal* report presented in 2011.

These recommendations will remain standing if the stakeholders concerned with the management of hazardous substances do not support and apply them. This document's authors are aware that some of these recommendations need to be better defined, including their

implementation process. We are available to participate with other stakeholders in such a process.

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Introduction

On July 6th 2013, the Lac Mégantic tragedy brought public attention to the presence of hazardous substances in their community and the hazards associated with their presence. Members of the public are concerned and many have rightly requested better controls and regulations. These hazardous substances are however key to our current lifestyle and their complete elimination is impossible in the foreseeable future. They are used for example to heat our houses and industries (natural gas, propane, fuel and bunker oil), sanitize our drinking water (chlorine), refrigerate our food and arenas (ammonia), clothe ourselves (polyester fibers) and provide transportation for ourselves and the goods we need (gasoline, diesel, propane, liquefied natural gas). These substances are fabricated, stored, transported, used and eliminated in our neighbourhoods, many times without our explicit knowledge.

Rail transportation is but one mode of transportation among others, like pipelines, trucks (tank trucks or those transporting smaller containers like drums and pails) and maritime vessels[1]. All of these transportation modes are present in the heart of our communities and share transportation corridors with other users, among which are ¨ordinary¨ citizens. Moving away from populated areas the transportation of these substances is an objective that cannot be achieved within a reasonable period of time.

The transportation of hazardous substances is but one aspect of their presence in our lives. Recent accidents in Sherbrooke (3 fatalities and over ten people injured in November 2012 at Neptune Technologies and Bioressources following an explosion involving acetone), in Valcourt (1 fatality et one injured at Bombardier also in November 2012), Côteau-du-Lac (two fatalities following an explosion of pyrotechnic material in June 2013), ammonia releases from arenas and refrigerated facilities (in Laprairie on Sept 2, 2013, and at the meat transformation plant of Olymel in Vallée-Jonction on August 12, 2013), a fire in the presence of acids at Aldex Chemicals in Granby in October 2013 and the concerns related to the presence of PCB's in Pointe-Claire in August 2013 and to pipeline projects currently under review (submitted by Enbridge and Trans-Canada) are increasingly present in our discussions.

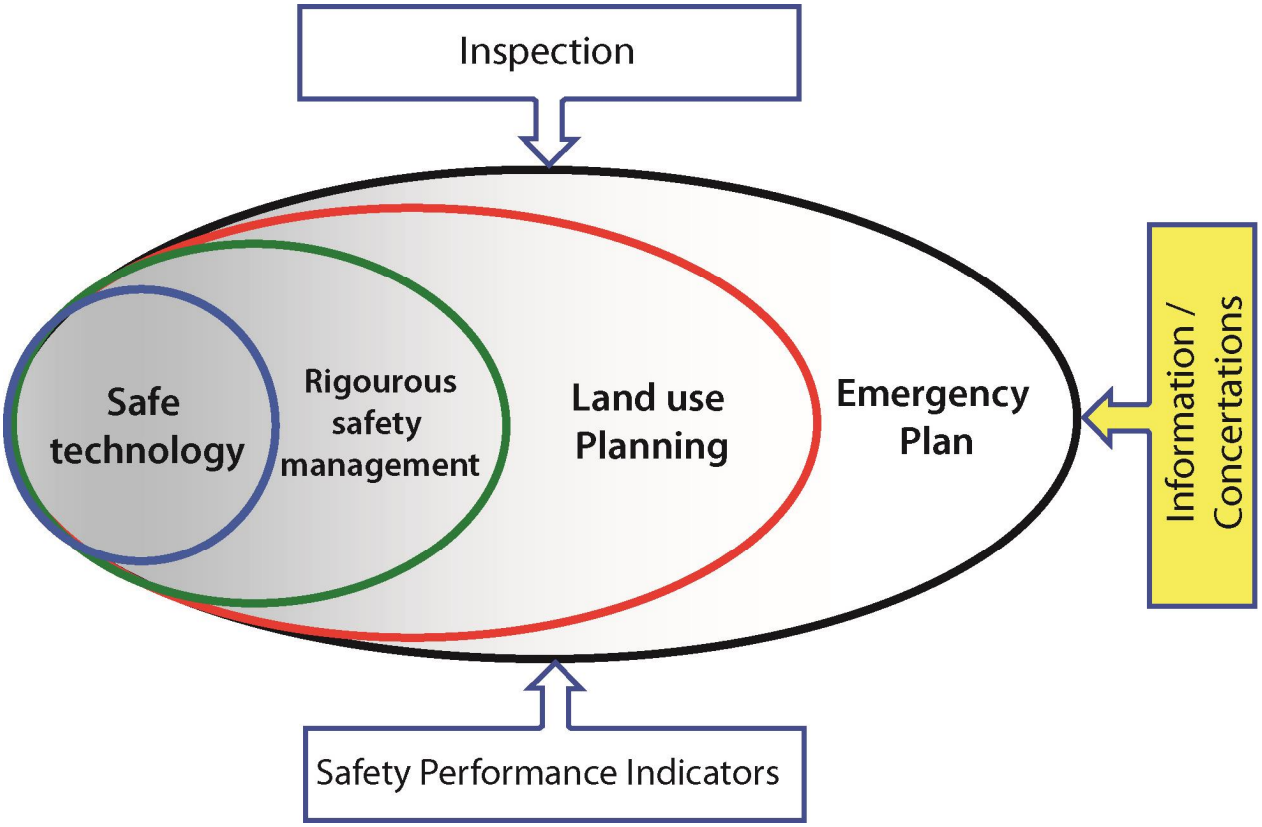
The objective of this document is to provide decision makers with recommendations that have been elaborated by three non-profit associations active in public safety, risk management and business continuity in the province of Quebec (links to the web sites of these associations are available in appendix 2 of this document). The aim is to improve safety in the management of hazardous substances present in our communities. These recommendations have been elaborated following a vast consultation process and have obtained the support of several stakeholders and partners, a list of which appears at the beginning of this document.

[1] This report does not address the maritime transportation of hazardous substances, the authors not having sufficient expertise in this area.

Recommendations for the safe management of hazardous substances

The safe management of hazardous substances present in our communities requires several elements, which depend on various stakeholders involved in the manufacture, storage, transportation, usage and final elimination of these substances. This section of the document presents a summary of these elements, illustrated in figure 1 below.

Figure 1 – Elements of the safe management of hazardous substances process[2]



Safe technology

The selection of the technologies that will be used to manufacture, store, transport, use and eliminate hazardous substances is of primary importance. Choices must be made according to a rigorous decision making process that includes risk assessments. These decisions are often made by private sector decision makers and include economic analyses, profit forecasts and projections that are sometimes difficult to reconcile with employee and public safety and environmental protection imperatives.

[2] Translated and adapted from the document ¨Fondements de la gestion sécuritaire¨, J. P. Lacoursière, October 2010

Recommendation no.1 – Selection of safe technologies

Project sponsors and facility/equipment operators that manufacture, use, store, transport or eliminate hazardous substances that exceed threshold quantities and concentrations (for example those listed in the *federal environmental emergencies (E2) regulation* and in the MIARC's *Risk management guide intended for municipalities and industry*) must produce and make available to regulatory agencies a safety case report duly signed by a competent professional (legally certified to proceed in his/her province). This report must highlight the technological alternatives considered and demonstrate that the risks have been reduced to the lowest achievable level (ALARA or ALARP concept), preferably from the design stage, given the knowledge available and the applicable standards at the time the report is issued. This report must be updated on a regular basis, at the very least every five years or when significant changes are made to the facilities or new knowledge becomes available.

- At the federal level, include this requirement in the E2 and in the TDG regulations and in the NEB regulations pertaining to pipelines (in particular in the CSA Z662 standard on oil and gas pipelines):
- At the provincial level, this requirement should be included in the environmental protection act (LQE) and serve as a basis in the application for a certificate of authorization (CA). It should also be included in the Building act (loi sur le bâtiment), the safety code (code de sécurité), the law on petroleum products and the safety and health act (LSST) (articles 62.1 to 62.21 sub-section 5 - Information concernant les produits contrôlés, articles 63 to 67 of Section III – Fournisseurs and of article 51 – Obligations de l'employeur) and/or in accompanying regulations, among which the Règlement sur l'information concernant les produits contrôlés (RIPC) and the Règlement sur la santé et la sécurité du travail (RSST) (articles 70 à 100).

Recommendation no.2 – Revision of the E2 regulation

The quantities and concentrations mentioned in the federal environmental emergencies (E2) regulation should be revised to ensure that all installations having an off-site impact following the release of a hazardous substance are covered. Ammonia and chlorine are two examples of substances for which the quantities listed in the regulation are deemed to be too high.

Rigorous risk management system

The protection of people, the environment and of public infrastructures requires the implementation and active maintenance of a rigorous risk management system. This system relies on a risk management policy approved at the highest level of the organization. Sufficient human and monetary resources, both in quantity and quality, must be available to sustain the management system, correct deficiencies and improve performance on a continuous basis. Regular management reviews must be performed to evaluate and report the performance of the organization to the highest management level, preferably to the board of directors.

Recommendation no.3 – Implementation of a risk management system

All organizations that operate, or wish to operate, installations and/or equipment that manufacture, store, transport, use or eliminate hazardous substances above specified threshold

quantities and concentrations (e.g. those listed in the federal E2 regulation, revised as per recommendation no.2 above) must put in place and maintain a risk management system comparable to the *ISO 31000-2009 Risk management* standard, the ¨*Process safety management standard, First Edition*¨ (CSChE, 2012), the ¨*Risk management guide intended for municipalities and industry*¨ (MIARC, 2007), the *Responsible Care* program of the CIAC or an equivalent. The organization must demonstrate the continuous improvement of its management system via performance indicators and during audits performed by the appropriate regulatory authorities.

- At the federal level, include this requirement in the E2 regulation, in the TDG regulation and in the NEB regulations and standards regarding oil and gas pipelines (for example, the CSA Z662 standard on oil and gas pipelines).
- The federal government should coordinate with the provinces the creation and maintenance of an independent organization mandated to investigate significant accidents[3] involving hazardous substances in Canada, similar to the Chemical safety board (CSB) in the US. This organization would provide recommendations to avoid the reoccurrence of similar or related accidents and maintain a database of all accidents that have taken place in the country.
- At the provincial level, include this requirement in the *environmental quality act* (LQE), for all environmental impact studies. Include also in the *Loi sur le bâtiment* (building act), the law on petroleum products and the worker safety act and its related regulations (managed by the CSST).

Land-use planning

The presence of buffer zones between installations that present risks related to hazardous substances and the general population is often the first and best protection mechanism against the adverse consequences of accidents for which the first responders' reaction time is insufficient.

Recommendation no.4 – Land-use planning

Unambiguous land-use planning guidelines, around sites or along corridors that handle or transport hazardous substances, must be developed by provincial authorities and implemented by municipalities at the local level. These guidelines should be based on MIACC's *Risk-based land use planning guidelines,* (1995, revised in 2008) or MIARC's document ¨*Les valeurs de référence des seuils d'effets pour déterminer des zones de planification des mesures d'urgence et d'aménagement du territoire* (MIARC, 2013) depending on the size and complexity of the installation.

- At the provincial level, include this requirement in the *Loi sur l'aménagement et l'urbanisme* (LAU) and its regulations. The MAMROT, the MSP, the MSSS and the

[3] We consider significant any incident that results in one or several fatalities, in the evacuation of a significant number of members of the public and/or in significant environmental damages in the public domain. This definition will need to be refined later.

MDDEFP should develop the required framework to facilitate its implementation by municipalities;

- At the municipal level, MRC's and municipalities must ensure that their zoning and land-use planning by-laws take in accounts the risks related to hazardous substances, as per the framework developed at the provincial level.

Emergency response plans

A good emergency response plan (ERP) is essential to respond effectively to accidents that involve hazardous substances.

Recommendation no.5 – Emergency response plan

a) All organizations that operate, or wish to operate, installations and equipment that manufacture, store, transport, use or eliminate hazardous substances above limit quantities and concentrations (e.g. those listed in the federal E2 regulation) must provide an emergency response plan that meets specific minimum requirements;

b) This plan must be shared and coordinated with local emergency response authorities to facilitate and efficient response in case of accidents. It shall be based on accident scenarios established using state of the art risk analysis and take in account the potential impact on people, the environment and public infrastructures. The emergency planning zones shall be defined following the modelled consequences of the above mentioned scenarios and based on consequence values mentioned, for example, in MIARC's document ¨*Les valeurs de référence des seuils d'effets pour déterminer des zones de planification des mesures d'urgence et d'aménagement du territoire* (2013) and in the *Manuel d'urgence : présentation des valeurs seuils utilisées dans les situations d'urgence pour une expositions aux produits chimiques toxiques ou corrosifs dans l'air*, Direction régionale de santé publique de la Capitale-Nationale). .

c) Annual exercises must be organized and coordinated with local emergency response organizations. The exercises must be evaluated and the resulting recommendations must be recorded and tracked until fully implemented. The exercises must be of varying scope and complexity and programmed over a five year period.

d) The emergency response organizations involved must ensure that they have the necessary resources to respond efficiently to accidents involving hazardous substances that can occur at industrial plants, storage sites and along transportation corridors.

- At the federal level, some of these requirements are already listed in the E2 and TDG regulations. They should be reinforced to include initiatives similar to TEAP (a CIAC initiative) and by requiring all shippers, transporters and receivers of hazardous substances to have an effective ERP and a sufficient response capability (internal or contracted out) acceptable to the federal authorities.
- At the provincial level, this requirement should be included in the ¨Loi sur la sécurité civile¨ (for municipalities and enterprises) and coordinated with the federal E2 regulation;
- At the municipal level, municipalities and MRC's must ensure that their public safety plans (¨schémas de sécurité civile¨, or equivalent) take in account the risks associated

with hazardous substances present on their territory and that their ERP's enable them to respond effectively in case of accident.

Community awareness and local emergency response coordination

One of the guiding principles of the OECD pertaining to chemical risk management recognizes the right for citizens to be informed of the risks to which they are exposed[4]. The citizens are responsible for their own safety (refer to articles 5 and 6 of the *Loi sur la sécurité civile du Québec*) and should therefore be able to react properly when an accident involving a hazardous substance happens in their neighborhood. This principle is built into the MIARC's *Risk management guide for major industrial accidents intended for municipalities and industry* (MIARC, 2007 edition). Also the risk communication charter developed and presented at the 2011 *Forum sur la communication des risques* organized by the *Agence de santé et des services sociaux du Centre-du-Québec* is also a good initiative to follow[5].

Recommendation no.6 – Community awareness and local emergency response coordination

All organizations that operate or wish to operate installations or equipments that manufacture, store, transport, use or eliminate hazardous substances must inform the population, that would be affected by a potential accident, of the potential consequences that may result from the said accident, of the immediate measures to be taken to protect themselves and of the emergency measures that will be implemented by the local emergency response organizations. Local emergency planning committees (LEPC) or equivalent must be created in the municipalities or MRC's where the volume of hazardous substances present or circulating justifies it. These committees must include citizens' representatives and will have as a primary objective the preparation and coordination of emergency response plans and risk communication initiatives. The roles and responsibilities of the committee members will also be established.

- At the federal level, this requirement is already present in the E2 regulation (see article 4.3) g). As for the TDG and NEB regulations, initiatives similar to TRANSCAER by the CIAC should be made mandatory.
- At the provincial level, this requirement should be included in the *Loi sur la sécurité civile* (for municipalities and private organizations);
- At the municipal or regional level, MRC's and/or municipalities must ensure that LEPC's are active and properly supported in order to accomplish their mandate.

Inspection

Compliance to laws and regulations can only be verified through a rigorous inspection program conducted by the public authorities responsible for their application. The existing regime of regulatory requirements partially based on voluntary initiatives (adopted by too few organizations) has proven to be ineffective to achieve the levels of performance needed to properly protect the public and the environment. As reported by the federal and provincial auditor generals, the number of inspectors is insufficient, the willingness to enforce the laws and

[4] *OECD Guiding principles for chemicals accidents prevention, preparedness and response*,OECD, 2003.
[5] See www.agencesss04.qc.ca/reseau-regional/mesures-durgences/forumrisques2011_prog.html

regulations defective and there is no fines program in place for persons and organizations that violate the legal requirements.

Recommendation no.7 – Inspection

Public authorities and agencies responsible for laws and regulations concerning hazardous substances must have at their disposal sufficient competent resources to enforce compliance. The frequency of the inspections could be adjusted to reflect actual company or sector performance, which would constitute a strong incentive to performance. Inspectors duly mandated and trained should be able to issue fines to non-compliant organizations or individuals.

- At the federal level, Environment Canada, the NEB and Transport Canada already have inspection capabilities that should be reinforced as needed.
- At the provincial level, the MDDEFP, the MSSS, the CSST and the Régie du bâtiment also have inspection capabilities that should be reinforced as needed;
- At the municipal and regional levels, MRC's and/or municipalities must ensure that all inspectors have the training and authority required to verify compliance to zoning and fire prevention by-laws.

Accountability of organizations and their managers/directors

We consider unacceptable that the society in general bears the burden of human and economic consequences resulting from an accident involving hazardous substances. It appears too simple for organizations and their directors to transfer the risks to third parties via subcontracts, insufficient insurance policies or bankruptcy protection measures. Managers and directors must also be made personally accountable for their decisions.

Recommendation no.8 – Accountability of organizations and their directors and managers

Federal and provincial governments must reinforce the application of the penal and criminal provisions regarding the responsibility of organisations and their directors following an accident involving hazardous substances. It is therefore recommended that:

- A systematic review of organizational practices be conducted following an accident that had significant consequences on people, the environment and public infrastructures. This review should focus on the due diligence exercised by the organizations involved and their managers/directors (including product suppliers, equipment designers and manufacturers) in light of applicable best practices in the field of risk management;
- Existing penal and criminal provisions in current laws and regulations must be reinforced to discourage deviant behaviors;
- If the local emergency response capabilities are deemed to be insufficient by the authorities (see recommendation no.4 above), it will be possible to finance this response by establishing a monetary fund that would be financed through a special contribution applied to each ton of hazardous substance produced, transformed or transported in the

country. A similar system already exists to finance the emergency response capabilities in the maritime sector.

Harmonization of laws and regulations

The current legal framework in the field of hazardous substances management is incomplete, confusing and complex.

Recommendation no.9 – Harmonization of laws and regulations

A working group including representatives from the federal, provincial and municipal governments should review all legal requirements currently in force and attempt to harmonize their wording and application. Additional requirements should be added where deemed necessary.

Training of risk management professionals

The responsible management of risks pertaining to hazardous substances starts with the ability to properly assess and manage them. The required competencies in this field are greatly lacking, in particular among engineers responsible for the design and operation of installation and equipments used to manufacture, store, transport, use and eliminate hazardous substances.

Recommendation no.10 – Risk management training

- Universities and colleges carrying educational programs leading to professions critical to the safe management of risks involving hazardous substances in our society must ensure the a sufficient number of courses addressing the safe management of risks be included in their programs;
- A university (or interuniversity) chair should be established to develop the required knowledge to improve risk identification and assessment techniques and methods, in collaboration with similar institutions in the world;
- Professional institutions and organizations which have a legal responsibility for the protection of the public and of the environment must ensure that their members have sufficient risk management knowledge and competency to fulfill their obligations. If needed, a mandatory training program should be designed and implemented for current members, within a reasonable timeframe;
- A public education program should be developed and implemented to ensure that citizens' representatives in local emergency planning committees (LEPC or equivalent) have the basic skills to fulfill their role. Similarly, programs should be put in place in the school system to sensitize the youth to the risks attached to hazardous substances.

This recommendation is intended especially for engineers that play a crucial role in our society in the proper management of risks associated with hazardous substances.

Conclusion

It is interesting to note that several of the above mentioned recommendations have found some support in chapter 6 of the November 2013 of the *Vérificateur général du Québec* (auditor

general) and in section V of the *Vérificateur général de la Ville de Montréal* report presented in 2011. In addition, the recent public safety policy adopted by the Quebec government goes along with several recommendations mentioned in this document.

These recommendations will remain standing if the stakeholders concerned with the management of hazardous substances do not support and apply them. This document's authors are aware that some of these recommendations need to be more precise, including their implementation process. We are available to participate with other stakeholders in such a process.

Appendix 1 - List of acronyms

The following acronyms can be found in the text of this report :

ALARA: ¨As low as reasonably achievable¨

ALARP: ¨As low as reasonably practicable¨

ASCQ : Association de sécurité civile du Québec

CIAC: Chemical industry association of Canada

CCPS: Center for chemical process safety

CEPA: Canadian environmental protection act

CSB : Chemical Safety Board

CSST : Commission de la santé et sécurité au travail (Quebec 's workers compensation board)

EC : Environnement Canada

EE (E2) : Federal environmental emergencies regulations

ERP: Emergency response plan

LAU: Loi sur l'aménagement et l'urbanisme (Quebec's Land use planning act)

LQE: Loi sur la qualité de l'environnement du Québec (Quebec's environmental protection act)

MAMROT: Ministère des affaires municipales, des régions et de l'occupation du territoire du Québec (Quebec's ministry of municipalities)

MDDEFP: Ministère du développement durable, de l'environnement de la faune et des parcs du Québec (Quebec's ministry of the environment and sustainable development)

MIACC: Major industrial accident Canadian council

MIARC: Major industrial accident reduction council

MRC: Municipalité régionale de comté (regional municipality)

MSP: Ministère de la sécurité publique du Québec (Quebec's ministry of public safety)

NEB: National energy board

OECD: Organization for economic cooperation and development

RECO-Québec : Réseau d'échange en continuité des opérations du Québec

SST: Santé et sécurité au travail (safety and health)

TEAP: Transportation emergency assistance program

TDG: Transportation of dangerous goods

TSBC: Transportation safety board of Canada

TRANSCAER: Transportation community awareness and emergency response

Appendix 2 – About CRAIM, RECO-Québec and ASCQ

The vision and mission of each of the three associations and their news and publications can be found on their respective web sites at the following addresses:

www.craim.ca

www.ascq.org

www.reco-quebec.org

Letters of support for the Alliance or requests for information should be sent to:

Association de sécurité civile du Québec (ASCQ)

C/O President of the association

827 Boulevard Crémazie Est, bureau 350

Montréal (Québec)

H2M 2T8

email: secretariat@ascq.org

Appendix 3 – Organizations solicited for support

The support of the following organizations (non-exhaustive list) will be sought prior to the publication of the final version of this report:

- ACSIQ (Association des chefs en sécurité incendie du Québec)
- AIEM (Association industrielle de l'Est de Montréal)
- APSAM (Association paritaire pour la santé et la sécurité du travail – secteur des affaires municipales)
- ATPIQ (Association des techniciens en prévention incendie du Québec)
- Centre risque et performance, École Polytechnique de Montréal;
- CIAC: (Chemical industry association of Canada)
- CIRANO (Centre interuniversitaire de recherche en analyse des organisations)
- CMMIC (Comité mixte municipalité industries citoyens de l'Est de Montréal)
- CSChE (Canadian society for chemical engineers, PSM group)
- FQISI (Fédération Québécoise des Intervenants en sécurité incendie)
- FQM (Fédération Québécoise des municipalités)
- OIQ (Ordre des ingénieurs du Québec)
- OUQ (ordre des urbanistes du Québec)

- UMQ (Union des municipalités du Québec)