THE DEMONIZATION OF CHRYSOTILE ASBESTOS: ENOUGH IS ENOUGH!

Additional information

April 2018

Contents

THIS DOCUMENT IS A TRANSLATION FROM FRENCH.

1. AMPHIBOLES AND CHRYSOTILE: AN INTENTIONNALY DECEPTIVE CONFUSION

Why do groups and individuals constantly insist on lumping together all forms of asbestos?

Theirs is a **deception** aiming at **bypassing both science and the clear and unequivocal desire** of our elected officials who support the reutilization of serpentine mine tailing piles.

- Asbestos is the name used for the purpose of trading products made of mineral fibres with **useful mechanical, thermal and chemical properties**.

- It encompasses a total of six (6) minerals further grouped into two (2) families, serpentines which comprise a single fibrous form, namely chrysotile (white asbestos); and amphiboles, which comprise 5 distinct fibres, anthophyllite, actinolite, tremolite, amosite (brown asbestos) and crocidolite (blue asbestos).

- Studies have demonstrated that because of their structure, their flexibility and their chemical composition, inhaled **serpentine** fibres remain in the lungs for a **considerably shorter period of time** and are **quickly** eliminated by the metabolism.

- **Serpentine** has the shape of a sheet rolled on itself and is coated with magnesium (a light metal). It is a silky fibre that is susceptible to acidic environments, which accounts for its faster and easier elimination.

- **Amphiboles**, by opposition, is coated with quartz (a crystallized natural silica); it has the shape of needles that are not easily eliminated by the lungs and can survive for a long period in acidic environments. Its chemical makeup and physical properties differ from those of chrysotile, and its level of dangerousness is not at all comparable.

*"A number of studies have demonstrated that they (amphiboles) remain in the body **10 times longer** than chrysotile. Others establish that the quantity of chrysotile fibers must be **several hundred times higher** for them to induce a risk similar to that of certain amphiboles."*

*"(…) Notwithstanding the scientific proofs which differentiate their health impact, chrysotile and amphiboles are still being **wrongly amalgamated** under the name of asbestos. (…) **Apart from their common fibrous form, chrysotile and amphiboles are therefore very different minerals. To amalgamate them amounts to mixing apples and bananas**."*

Georges BEAUDOIN, Georges, geo., Ph. D, Josée DUCHESNE, Josée, ing., Ph. D.,
Thomas FEININGER, Ph. D. and Réjean HÉBERT, Réjean, ing., Ph. D.
"Asbestos and Chrysotile: Apples and Bananas!" - *Le Soleil*, March 25, 2010

*"This review provides a basis for substantiating both kinetically and pathologically the differences between chrysotile and amphibole asbestos. **Chrysotile**, which is **rapidly attacked by the acid environment** of the macrophage, falls apart in the lung into short fibers and particles, while the **amphibole asbestos persist**, creating a response to the fibrous structure of this mineral."*

David BERNSTEIN, Jacques DUNNIGAN, Thomas HESTERBERG, Robert BROWN, Juan Antonio LEGASPI, Velasco Raúl BARRERA, John HOSKINS et Allen GIBBS
« Health risk of chrysotile revisited » - Résumé
Critical Reviews in Toxicology – January 25, 2013.

Those who assimilate serpentine to amphiboles (which haven't been used in Quebec for almost 30 years) voluntarily perpetuate a deceptive confusion based on beliefs as opposed to documented scientific evidence. They are doing so to block the exploitation of serpentine mine tailings.

2. THE EVALUATION OF A POTENTIAL THREAT, NOT OF A GENUINE HEALTH RISK

What does it mean when a product finds itself on the list of the World Health Organization (WHO)'s International Agency for Research on Cancer (IARC) list of carcinogenic products?

Many published scientific studies have established that chrysotile can be used in a **safe, controlled and responsible way**, and that it doesn't carry an unacceptable health risk level. It must be noted that **no recently published study has called for banishing its use**.

Serpentine mine tailings contain only **chrysotile** asbestos fibres.

- The International Agency for Research on Cancer (IARC)'s list includes 120 agents (substances and mixtures) [as of January 26 2018] such as oral contraceptives, X-rays, alcoholic beverages, tobacco smoke, non-smoked tobacco, cold cuts, diesel fumes, wood dust, etc.

- This classification allows for the determination of a **potential** health **risk**. It means that a product's inclusion on the list stems from an evaluation based on a **possibility**.
  It doesn't in any way constitute an actual risk assessment.

- **A potential hazard is not the same as a health risk.** It cannot be considered as an acceptable way of determining a **true risk level.**

- It doesn't mean that chrysotile can't be used in a **safe, controlled and responsible** way, considering the significant technological improvements that have been introduced over the years.

Moreover, the Regional Director for Public Health of the Chaudière-Appalaches implicitly confirmed this principle of a safe, controlled and responsible use in a letter that was sent to all Thetford Mines residents.

"Asbestos fibres can be resuspended in the ambient air when mine tailings are manipulated or stirred. The concentration of asbestos fibres in the air can be diminished by avoiding these activities, or by practicing them using measures that will limit such resuspension. It's up to each individual to adopt responsible practices for that purpose."

Information document on the presence of asbestos it Thetford Mines' air
Letter to Thetford Mines' residents
December 10, 2009

- The safe controlled and responsible use program has proved its worth in the past years. The **best practices** referred to in the information document have been in place for a long time and they are strictly adhered to by the new Alliance Magnesium and Mag One projects, which **benefit from the financial support of all levels of government**!

The widely accepted method to evaluate the dangerousness of an industrial fibre is based on the "**3D**"s: **dimension**, **dose** and **duration**.

- It allows for the regulation of current practices and for the scientific determination of the potential consequences of exposure to all forms of fibres.

  - **Dimension** → Fibre size and potential risk
  - **Dose** → Amount of breathable fibres vs. controlled approach
  - **Duration** → Duration of presence in the lungs (biopersistency)

"Differences in chemical and crystalline composition, fiber dimension, aerodynamic characteristics and biodurability are among the critical factors that define the toxicological and pathological consequences of asbestos exposure. Specifically, fiber dimension can impact whether the fiber is respired, whether and how deeply it is deposited in the lung, and how efficiently and rapidly it may be cleared.

(...) data reported over the last several decades consistently support the conclusions that exposure to fibers longer than 10 µm (microns) and perhaps 20 (microns) are required to significantly increase the risk of developing asbestos-related disease in humans and that there is very little, if any, risk associated with exposure to fibers shorter than 5 microns."

Christy A. BARLOW, Matthew GRESPIN. Elizabeth A. BEST
« Asbestos fiber length and its relation to disease risk »
Inhalation Toxicology – December 2017

Since the length of fibres found in the serpentine tailing piles is generally inferior to 5 microns, there is no real threat associated with their safe, controlled and responsible use.

Where are the scientific studies that demonstrate that the fibers found in the serpentine tailing piles do not meet the 3D evaluation standards?

Where are the scientific studies that demonstrate that the size of fibres found in the serpentine tailing piles is such that they represent an unacceptable level of risk for human health?

3. THE RISK OF EXPOSURE: A MATTER OF THRESHOLD

Why do some groups and individuals continue to stubbornly and wrongly claim that all type of asbestos are carcinogenic and that they pose an unacceptable risk level for human health, all the while denying the existence of a practical exposure threshold?

Theirs is a **disinformation strategy** that aims at scaring the population, in order to ensure that chrysotile asbestos is also banned. Even if no threshold has been formally set, it certainly doesn't mean that it doesn't exist.

These groups and individuals deliberately ignore the fact that Great Britain's Health & Safety Executive - HSE has already concluded that the occurrence of a lung cancer linked to exposure to chrysotile is a matter of threshold, like asbestosis.

- The HSE and many scientists have confirmed that very few cases of mesothelioma (cancer of the pleura) can be attributed to chrysotile, despite the fact that thousands of workers were exposed to the product in the past. Rather, amphiboles are the main cause of those cancers.
- In practice, it is possible to keep exposure at a level below which risk, if it exists at all, is so low that it becomes undetectable. This is what is called a practical threshold.

They also ignore the unequivocal conclusion of a review of about one hundred scientific studies completed by eight (8) experts in 2013.

"(…) the studies they report show that low exposures to chrysotile do not present a detectable risk to health."

David BERNSTEIN, Jacques DUNNIGAN, Thomas HESTERBERG, Robert BROWN, Juan Antonio LEGASPI, Velasco Raúl BARRERA, John HOSKINS et Allen GIBBS
« Health risk of chrysotile revisited »
Critical Reviews in Toxicology – January 25, 2013

"(…) ***chrysotile is a serpentine with markedly different physical and chemical characteristics in comparison to amphiboles*** *(e.g., crocidolite, amosite, tremolite). In contrast to amphiboles, which are solid, rodlike fibers, chrysotile is composed like a rope of many fine fibrils, which tend to unwind. (…) Taken in context with the scientific literature to date, this report provides new robust data that clearly support* ***the difference seen epidemiologically between chrysotile and amphibole asbestos.****"*

David M. BERNSTEIN, Richard ROGERS et Paul SMITH
« The Biopersistence of Canadian Chrysotile Asbestos Following Inhalation » - Abstract
Inhalation Toxicology – November 15, 2013

International bodies such as the World Health Organization (WHO), the International Labour Organization (ILO) and the Rotterdam Convention (commercialization of certain chemical products) all recognize the **principle of a differentiated approach for the various asbestos fibres**.

The corollary of this recognition is that chrysotile is less dangerous than amphiboles when appropriate control measures are in place. Furthermore, neither those organizations nor the Convention have officially called for the banishment of chrysotile asbestos.

Where are the scientific studies that conclude that even low exposures to chrysotile asbestos present a real risk to human health?

4. THERE IS NO SUCH THING AS ZERO RISK

Some groups and individuals are arguing that asbestos' dangerousness for health commands the application of zero risk and of the precautionary principle and therefore, its banishment in all its forms.

There is no such thing as zero risk. Just like electricity or oil, for example, the exploitation of serpentine tailing piles doesn't present an unacceptable risk level and there is no valid justification for its prohibition when it can be done in a **safe, controlled and responsible** way.

As for the precautionary principle, as with many other laudable principles, it must be interpreted and applied in a rational way, on the basis of documented facts as opposed to beliefs, and of science, as opposed to impressions. Science must prevail on perceptions.

This becomes even truer when the businesses and organizations involved possess all the necessary scientific and technological knowledge and expertise to recuperate, valorize and usefully exploit tailing piles. Moreover, **Quebec's regional expertise** in this area is **unique, undisputable and recognized worldwide**.

Where are the scientific studies that would allow to conclude that our regions don't possess the expertise required to exploit their serpentine tailing piles?

To push for a blind and abusive application of a non-existing principle and of another that requires a rational and moderate approach amounts to displaying a zeal that is all the more deplorable as it compromises a revitalization of our regions based on the respect of an equilibrium between the three pilars of sustainable development (economic environmental and social).

5. REPEATING A FALSEHOOD, EVEN A THOUSAND TIMES, DOES NOT MAKE IT TRUE

Groups and individuals argue that chrysotile asbestos fibres can be airborne and are therefore are all the more dangerous as a single fibre can kill.

This **endlessly repeated falsehood** is part of a larger **disinformation strategy** which aims to scare the population and therefore to lead to a complete banishment of chrysotile asbestos as well.

- This affirmation doesn't hold water because chrysotile fibres are "imprisoned" inside dense products, are not brittle, and can't be airborne.

" (…) ***the presence of asbestos alone shouldn't be a source of concern****.*
Asbestos poses a risk to human health only when it is discharged to air and breathed."

Health & Safety Executive, Great Britain
"Asbestos FAQs"

In a 2011 communication entitled "The Asbestos Saga. Myths vs Facts" the expert Jacques Dunnigan, Ph. D. recalled that:

- some 12 litres of air per minute go through the lungs (or 17 280 litres per day);
- assuming that the ambient air naturally contains 0,001 fibre per millilitre, or one (1) fibre per litre, then 17 280 fibres transit through the lungs daily
- a concentration of one (1) fibre per cubic centimetre (1 f/cm^3) or per litre (1 f/l) is considered:
  - *"acceptable"* by the Ontario Royal Commission on Asbestos (ORCA);
  - *" not significant"* by the World Health Organization (WHO);
  - *"not justifying additional control"*, according to the Royal Society of London;
  - and a safe situation in certain countries.

Where are the scientific studies which seriously validate the idea that a single fibre can kill?

6. THE SAFE, CONTROLLED AND RESPONSIBLE USE OR CHRYSOTILE: THE DOUBLE TALK

Why impose an end to mine visits in a city where, according to the Public Health authorities, the risk of developing a cancer because of the presence of asbestos fibres in the ambient air is very low?

In a letter to Thetford Mines residents dated December 10, 2009, the Public Health Director for the Health and Social Services Centre of the Chaudière-Appalaches region, Dr. Philippe Lessard, stated that "*the risk of developing a cancer because of the presence of asbestos fibres in Thetford Mines' ambient air is very low*".

« (…) the probability of cancer-related deaths due to the presence of asbestos fibres in Thetford Mines' ambient air at about **1 death per 35 years**. This estimate was produced using the most plausible model, based on the presence of **chrysotile asbestos fibres only**.

(…) to better understand a risk's seriousness, it can be compared to other, better known risks. For example, based on the current knowledge, among Thetford Mines' population and **over a period of 35 years**, there would be **more than 1 000 deaths** due to lung cancer linked to cigarette smoking, **close to 100 deaths** linked to driving a car and **1 death attributable to the presence of asbestos in the ambient air**."

Background Document on the Presence of Asbestos in Thetford Mines' Air
December 10, 2009

The regional health director wrote these words while the asbestos mines were **still in operation** which is not the case anymore, as the last one **ceased its operations in 2011**.

- Yet, as stated in a letter dated March 12, 2018 sent by the Thetford Mines mayor to Dr Philippe Lessard, **the median age in the city** has risen from 48 years old in 2006 to 50,5 years old in 2011 and to 52,4 years old in 2016, while at the Quebec provincial level it went from 41 years old to 42,5 years old during the same period!

*"Asbestos fibres can be resuspended in the ambient air when tailings are manipulated or stirred. The concentration of asbestos fibres in the air can be diminished by avoiding these activities, or by practicing them using **measures that will limit such resuspension**. It's up to each individual to adopt **responsible practices** for that purpose."*

Information Document on the Presence of Asbestos it Thetford Mines' Air
December 10, 2009

Where are the scientific studies on which the public health director is currently basing is assertions that by walking on serpentine tailing piles or visiting mines inside a bus with its windows opened, people are exposing themselves to very large health risks?

This public health director has implicitly called into question the applicability of the principle of the **safe, controlled and responsible use of chrysotile asbestos**.

- Furthermore, the exemplary practices referred to in his background information document have long been in place and are scrupulously respected in by Alliance Magnesium and Mag One Operations' recent projects, that **benefit from the financial support of all three government levels**!

Close to 10 years later, and in the absence of any new facts that would justify an intransigent position with regard to chrysotile asbestos (on the contrary!), the same public health director threatens businesses and organizations under the pretext that they are using serpentine mine tailings found in the piles.

- In the case of the sightseeing tours organized by the Mineralogy and Mining Museum, he carried his zeal to extreme lengths when he claimed, in all seriousness, that tourists walking along the minors' paths kick up some dust and can be needlessly exposed to soil-bound asbestos fibres.

- **It is not a senior official's role to support a crusade or a lobby at the expense of the region's best interest.**

Where are the scientific studies on which the director for public health is basing himself when he hints that the projects aiming at reusing our serpentine mine tailings do not respect the principle of a safe, controlled and responsible use? To threaten organizations and businesses and to force them to terminate part of their activities?

"If the public health director possesses information that we don't have, besides the fact that he is always against what we are doing, it is his primary responsibility to inform both the population and the minister in charge."

Laurent LESSARD
Member of the National Assembly for Lotbinière Frontenac, Quebec's Minister for Agriculture, Fisheries and Alimentation, Minister responsible for the Centre-du-Québec region.
***Courrier Frontenac* – March 13, 2018**

7. HIGHLY DUBIOUS SOURCES

In 2014, the World Health Organization (WHO) formally decided that chrysotile could cause lung, larynx, and ovarian cancers, mesothelioma and asbestosis.

The World health Organization (WHO)

One must read the WHO's document titled Chrysotile Asbestos paying special attention to its preliminary remarks.

- The WHO writes that "**all reasonable precautions** have been taken to verify the information contained in this publication" but that "the published material is being distributed **without warranty of any kind, either expressed or implied**."

- the WHO declares that "the **responsibility for the interpretation and use** of the material **lies with the reader**."

Such "kid gloves" reveal the WHO's extreme caution with regard to the document's contents. These warnings warrant the consultation of other sources in order to have a **global, complete and les biased** picture of the situation.

Of note: the WHO has never officially called for the banishment of the chrysotile fibre!

The International Chrysotile Association (ICA) [www.chrysotileassociation.com] has based its positions on published scientific studies, which means their contents have been validated by expert committees.

***Science-Based Facts. Relevant Health Issues* (2015)**
http://www.chrysotileassociation.com/data/relevant_health_issues_2015.pdf

***A review of the World Health Organization's publication chrysotile asbestos* (2016)**
http://www.chrysotileassociation.com/data/review-who.pdf

***Asbestos amphiboles must be banned. Chrysotile must be controlled. Science must prevail.* (2017)**
http://chrysotileassociation.com/data/ICA_Chrysotile_MustBe_Controlled_v9F-web.pdf

8. SERPENTINE MINE TAILINGS AND OUR REGIONS' SUSTAINABLE DEVELOPMENT

How is the exploitation of mine tailing piles essential to our regions' revitalization?

Hundreds of millions of tons of solid mineral fragments of various sizes out of which the major part of commercial chrysotile fibers was extracted over the course of more than a hundred years have created huge heaps (called **piles**) that are located near the former mining sites.

They contain different types of metals and minerals (magnesium, nickel, chrome, cobalt, etc.) whose **exceptional qualities** make them first class material for the creation of **high value-added products**.

Hence the importance of valorizing them, because of their enormous commercial potential that could contribute to the creation:

- of **new wealth-creating businesses** in two (2) regions reeling from the mines' permanent closure;
- of **quality jobs** that will replace the thousands that were lost over the past decades;
- of shareable **collective wealth**.

In practice, this is a process of industrial conversion which meets the requirements of sustainable development. The regions and communities are not calling for the mines' reopening nor for the resumption of the exploitation of serpentine fibres.

As per the economic stakeholders who are reusing or wish to reuse mine tailings, they are responsible businesses whose processes are subjected to stringent safety and control standards which they feel duty bound to respect scrupulously.

Where are the scientific studies which conclude that a safe, controlled and responsible use of chrysotile asbestos is impossible and that it should therefore be definitely banned?

Where are the scientific studies that lead to the conclusion that our regions don't have the expertise required to exploit their serpentine mine tailing piles?

9. A FALSE URGENT NEED TO ACT

Some groups and individuals are saying that the risks associated to asbestos are so serious that it should be banned in all its forms, without further delay.

Facts and conclusions of recently published scientific studies demonstrate that there is **no reason to ban chrysotile**, especially at a time when the federal government itself recognizes the importance of ensuring a regulatory alignment between Canada and the United States and when the latter are in the middle of a major update of existing scientific knowledge on asbestos exposure.

- In the most recent version of its planned regulation on asbestos, the federal government advocates "**cooperation on regulatory matters**" as well as "**international collaboration**".

- It insists on **the importance of aligning** Canadian and American **regulations** and of guaranteeing a level playing field for the two countries' businesses.

The United States have initiated a **rigorous and well-structured process** which aims not only to update their **scientific knowledge on asbestos exposure** but also to evaluate the associated risks. In the Fall of 2016, the Environmental Protection Agency (EPA) had announced that asbestos would be among the first 10 chemical products that would be evaluated in terms of their potential risks for human health and the environment, in accordance with the reform of the Toxic Substance Control Act (TSCA).

In fact, the American government has demanded that a **rigorous and in-depth reflexion** (including researches, analysis, tests and scientific evaluations) be led over a period as long as necessary in order to have in hand an **exact and precise assessment** which will allow for the formulation of **appropriate recommendations** that will lead to **informed, justified and justifiable decisions**.

In practice, the relevant authorities plan to follow a **structured, well coordinated, rational and efficient process** where **documented facts** will prevail over approximations, misinterpretations, perceptions, even prejudices. In other words, this exercise doesn't aim firstly the banishment of one or many of the targeted products (including asbestos) but could eventually lead to such conclusion after completion of a very thorough scientific demonstration. In other words, **banishment if necessary, but not necessarily banishment**.

While our Southern neighbours are giving themselves the means to proceed correctly and methodically, Canada clings to its idea of **banishing chrysotile asbestos as early as next Fall, even if this approach isn't supported by any recent scientific study**.

Where are the scientific studies that conclude that the safe, controlled and responsible use of chrysotile asbestos is impossible and that it should therefore be banned definitively?

What are the Canadian government's real motivations, in a country rich with natural resources which has always responsibly promoted and defended the principle of the safe and controlled use of all of its minerals and metals?

Since it would be prudent to await the results of the American review process, the Quebec government must firmly remind the Canadian government that acting precipitously is counter-productive and risky.