



# Air Impact Assessments for Quarries in Ontario: Protecting the Public

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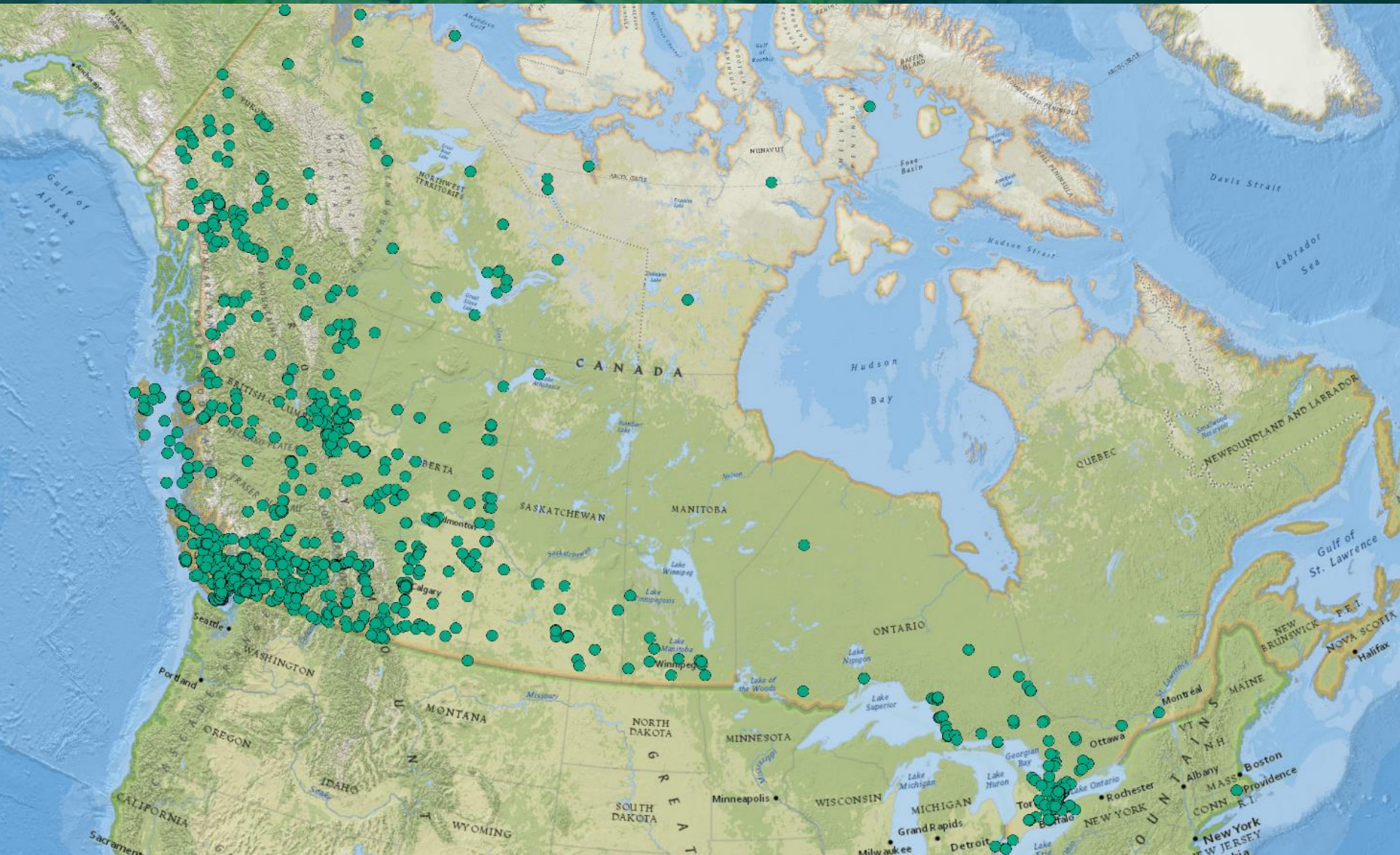
Hemmera, a wholly owned subsidiary of Ausenco, is a leading Canadian environmental consultancy valued for our expertise and boutique approach. Our highly respected professionals have created opportunities for sustainable growth and balanced development for our clients.

With a reputation for integrity and technical excellence, Hemmera offers progressive environmental services in Site Assessment and Remediation, Environmental Planning and Ecology, and Community Engagement and Social Sciences.





# Our Projects Across Canada





# Me.....

- Expert in Air Quality
- Author IAIA Guide on AQ Assessments
- BSc(HONS) Geology, PhD Dispersion Modeling
- Qualified before OMB re air quality and gravel pits





# The Talk.....



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- Air Quality impacts of quarries
- The right way to assess air quality health impacts from quarries, versus, what was done by JDCL
- To do

# Air Quality Impacts of Quarrying Operations: dusts

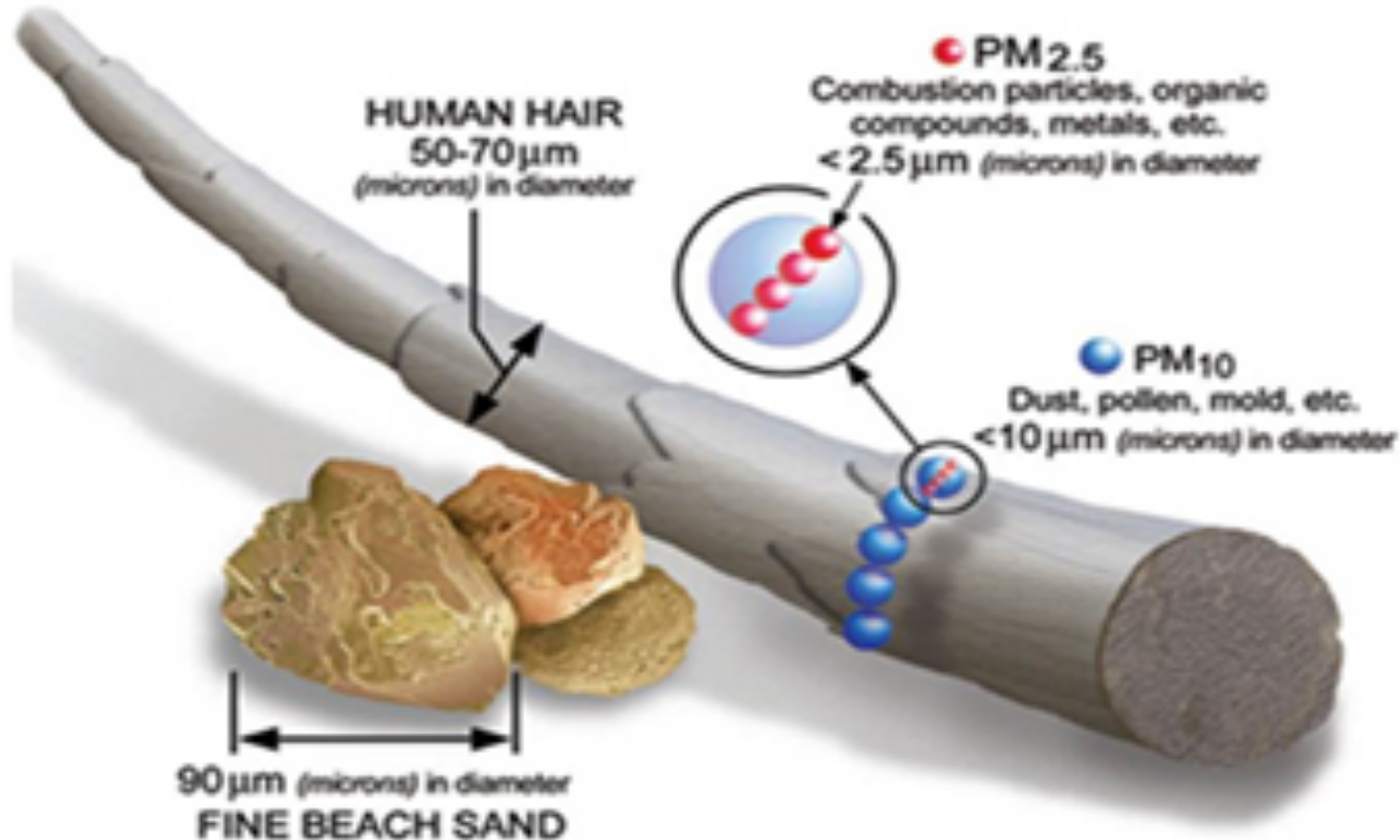
- Sources – dust from site preparation, extraction, gravel road traffic
- Contaminants – dust (TSP/PM<sub>10</sub>/PM<sub>2.5</sub>), crystalline silica, ?other minerals
- Potential health effects of these contaminants at high levels – cancer, respiratory problems, premature death





# Air Quality Impacts of Quarrying Operations: dusts

## Relative Size of Particulate Matter



## Air Quality Impacts of Quarrying Operations: engine exhausts



[gemenacom/fotolia.com](https://www.fotolia.com/1000000000/1000000000.html)

- Internal Engine Combustion emissions from vehicles
- DPM, B(a)P, benzene
- Potential health effects of these contaminants at high levels – cancer, respiratory problems, premature death

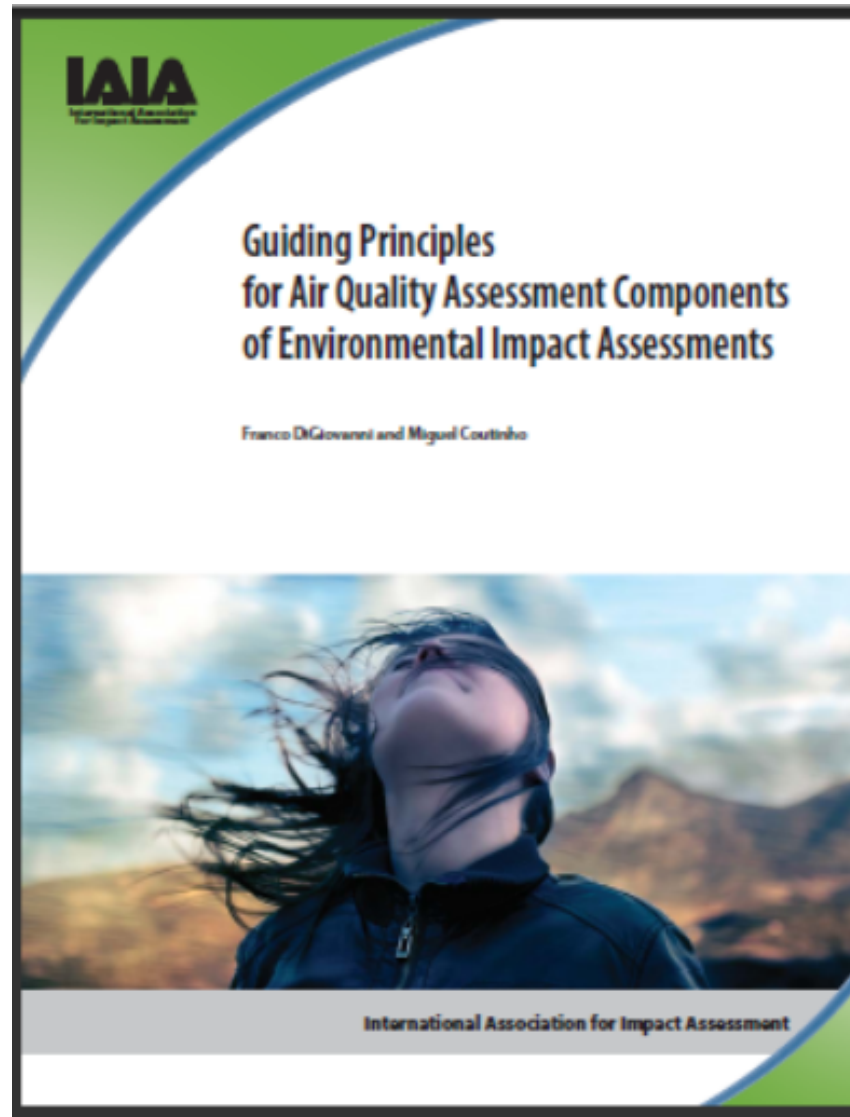


# Requirement for Air Quality Impacts: Ontario's Environmental Protection Act

- Prohibition, discharge of contaminant
- **14** (1) Subject to subsection (2) but despite any other provision of this Act or the regulations, *a person shall not discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment, if the discharge causes or may cause an adverse effect.* 2005, c. 12, s. 1 (5).



# International Association of Impact Assessment Guide: how to do Air Quality Assessments





# Scoping of project/assessment: what's included



- Terms of Reference
- Identification of the “subject” project and air emission sources
- Proponent’s onus....to reviewer’s satisfaction

## What JDCL didn’t do:

- Account for off-site truck traffic

# Identifying CoPCs: What's emitted

- Emitted contaminants from subject sources = Compounds of Potential Concern (CoPCs)



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## What JDCL didn't do:

- Account for all minerals
- Conservative assumptions for crystalline silica
  - Vehicles – DPM, B(a)P, benzene
  - Recycling materials



# Emission controls: conservatism and evidence



- Conservative estimate required in face of absent, or uncertain, data
- Scientifically valid proof of emissions controls

## What JDCL didn't do:

- Non-conservative road dust assumptions
- No scientifically valid proof of road dust watering control

# Modelling Air Quality Levels: unverified modifications



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- Air quality models – deposition options require special review and approval

## What JDCL didn't do:

- Obtain jurisdictional/3<sup>rd</sup>-party review of their modification



# Quarry Emissions adding to baseline AQ levels: The Campbellville Area



- Baseline should be specific, or conservative
- JDCL's baseline didn't account for major presence of 401 – JART agreed

# Resultant AQ levels compared to standards or IA conducted

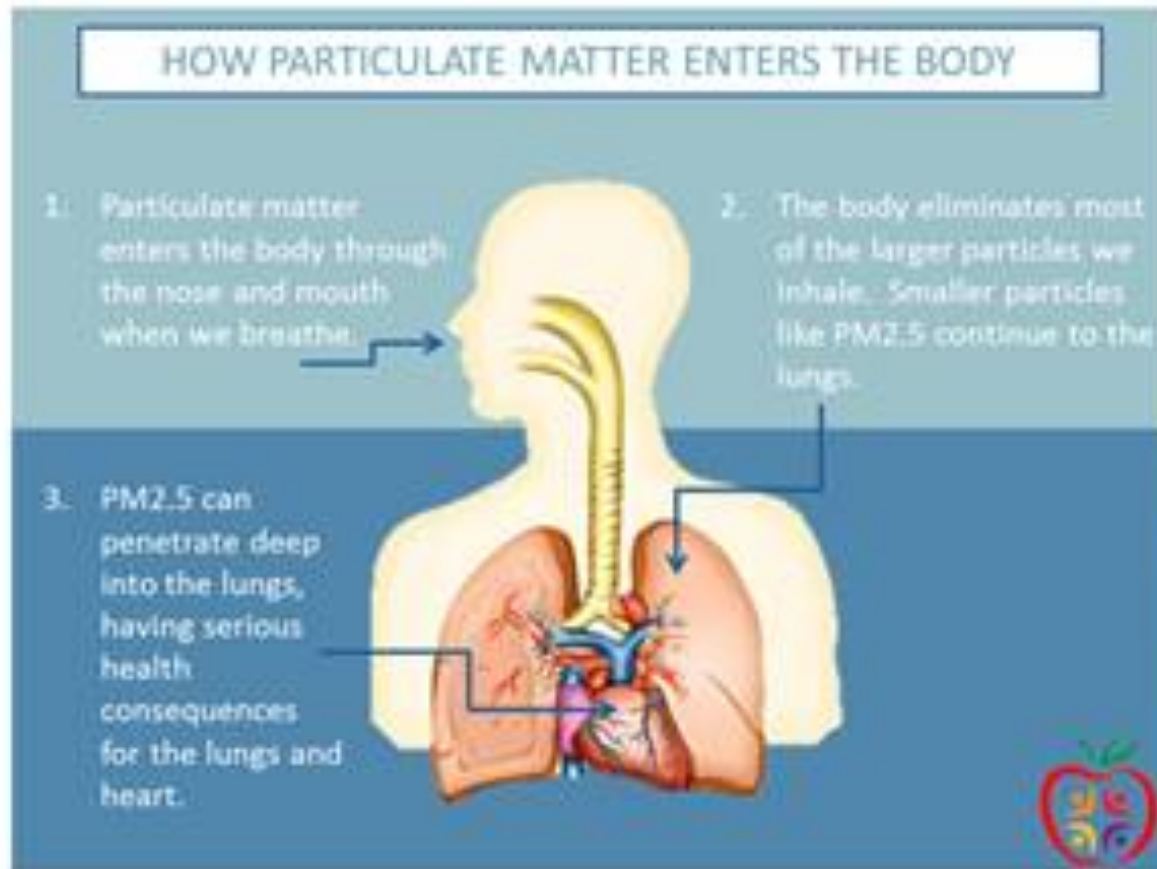
- Standards comparison
- Human health risk assessment
- Ecological impact assessment



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# Resultant AQ levels compared to standards or IA conducted



US Environmental Protection Agency:

Short-term (acute) exposure:

- Irregular heart beat
- Nonfatal heart attacks

Long-term (chronic) exposure:

- Aggravation of existing heart diseases
- Premature death of people with heart disease

Ministry of Environment, Conservation and Parks:

People with asthma, cardiovascular or lung disease as well as children and elderly people are the most sensitive.

# Resultant AQ levels compared to standards or IA conducted

## Health Effects in Oakville

- Based on annual concentration of 10 microgram/m<sup>3</sup> ~ 85 premature deaths in Oakville attributable to PM<sub>2.5</sub> pollution every year
- More of other outcomes documented in health effects studies
- For every microgram/m<sup>3</sup> added - 8 more deaths; for every microgram/m<sup>3</sup> reduced - 8 fewer deaths

(Source: ICAP 3.0)



# Resultant AQ levels compared to standards or IA conducted: Milton effects?



- If contaminant highly toxic (i.e., PM2.5)
- If baseline levels already high (i.e., PM2.5 from 401)
- Prevailing winds from proposed quarry to Milton

# Common “errors” by Industry Consultants

- Not speciating “mineral dusts” fully (or at all)
- Not estimating uncertain emissions conservatively
- Overly-optimistic or uncertain dust controls
- Not including recycling operations
- Dispersion modelling doesn’t include baseline air quality (or assessed poorly)
- Not conducting Health Impact Assessments on certain contaminants (e.g., PM<sub>2.5</sub>)





# Summary



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A fully qualified,  
review of JDCL's  
air assessment  
(preferably at  
JDCL's expense)  
is required





# Thank You. Questions?

## Contact Us

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