Silica Dust: Drilling
It will take your breath away

Enform’s Exposure Control Plan (ECP)
Outline

• What is silica?
• Why should I care?
• Exposure risk
• Exposure control
• Enform’s approach
• Questions?
What is silica

- Silica is naturally occurring and can be found everywhere (SiO$_2$)
- Silica can be crystalline (quartz) or non-crystalline (amorphous)
- Crystalline silica can be found in:
  - Rock
  - Sand
  - Products like cement, etc.

Why should I care?

- Silica is a hazard (primarily chronic) when it is breathed deep into the lungs (respirable)
- Silica causes the following illnesses:
  - Silicosis - lung scar tissue
  - Lung cancer
  - Bronchitis
  - Kidney disease
- Irreversible and progressive

[silica-win.wmv]
Exposure risk

• Silica’s OEL
  – 8-hour TWA
  – What does that mean?
  – 2X lower than lead (0.05 mg/m$^3$)
  – 400X lower than nuisance dust (10 mg/m$^3$)

– If it’s silica and it’s visible, overexposure is just a matter of time!
Drilling - Exposure Sources

- Handling and adding drilling mud dry-product additives
  - Barites, Graphite, etc...
  - If it’s naturally sourced, be suspicious
- Cement In-loading
  - Portland cement verses additives
- Cuttings Dryers
  - Most of cuttings are rock = silica
- Shaker Mist
  - Rock dust and fluid additives

Photo: Eelgin Industries
Controls - Engineering

• The answer to many silica exposures is engineering and administrative controls
  – This does not have to be expensive/difficult
    • Wet materials
    • Distance/time etc.

• Look for opportunities to make a difference!
  – Take some action (action = caring)
Controls - PPE

• Different dust levels = different protection levels
  – Respirator protection factors
    • Half-face - 10
    • Full-face - 50 and 100
    • PAPR or Supply Air - 1,000
  – Why? Leakage, where the respirator meets the face
  – Coveralls
So what do I need to do?

• Drilling - Dry-Product Additive Handling
  – Use engineering ventilation controls
    • Direct exhaust ventilation into mud tanks
  – Add product slowly – max 1 bag/minute
    • Reduces dust generation (energy)
    • Ensures complete incorporation into drilling fluid
  – Wear a respirator with P100 filters
  – Keep your distance from cement in-loading and use a dust capture bag on exhaust
  – Follow Invert exposure control plan
## Enform’s Approach

- **Silica ECP template**
  - Modular approach
- **Guidance Sheets**
  - Sources
  - Controls
  - Hazard Assessment

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#### Exposure Hazard Assessment - Hydromat Fracturing

The list of work site situations is not exhaustive; some tasks, such as equipment maintenance, are likely needed. Review the tables and look for the work site situations that are applicable to your work site. Implement the associated controls. For Tier 1 or higher work situations, analyze how often the work situation occurs and conduct regular exposure measurements to ensure controls are working. If the work situation occurs 30 or more days in a calendar year, implement periodic health surveillance.

#### Tier 0 - No respiratory protection required

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<th>Other control considerations</th>
<th>Monitoring date completed</th>
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#### Tier 1 - Half-face respirator with P100 filters

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**Enform’s Silica Exposure Control Plan**

1. Enform’s Silica Exposure Control Plan
2. Enform’s Information website: http://www.enform.ca/silica
Summary

• Silica is not nuisance dust!
• Silica is everywhere
• What you don’t know will still hurt you
• Enform has the answers you need
• Solutions by industry - for industry
Is your worker’s future clear?

Healthy Lung

Silicosis Lung

Questions

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