

# Sampling for Diesel Particulate Matter in Mines

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Technology Transfer Initiative

## Diesel in Mining

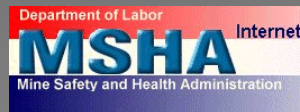
- Productivity vs toxicity
- Controversy over sampling and analysis
- Control is complex and expensive
- Alternatives to diesel power ???



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## Limits of Exposure - DPM

- Canada (1990):
  - 1.5 mg/m<sup>3</sup> (RCD)
- MSHA (2001):
  - 0.40 - 0.16 mg/m<sup>3</sup> (TC)
- ACGIH (2001):
  - 0.02 mg/m<sup>3</sup> (EC)



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## Health Concerns

- Eyes and throat irritation
- Visibility
- Long term health effects
  - suspected carcinogenicity



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## Objectives

- Emphasize the importance of sampling
- Identify mining applications where sampling can be used effectively
- Describe the procedures and equipment available

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## Sampling Applications

- Compliance with regulated exposure limits
- As a tool in assessing the impact and quality of engine and vehicle maintenance
- Measuring the efficiency of diesel control methods and technology

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## Personal Sampling Strategy

- Who to sample ?
- How often, how many samples ?
- Results reporting and clarity
- Actions to take



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## Personal DPM Sampling Train



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## Personal DPM Sample Analysis

- Respirable Combustible Dust (RCD)
- NIOSH 5040
- DEEP Research



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## Good Sampling Practice

- Pump: selection, care, calibration, settings
- Shift sampling, duration
- Sampling train assembly, fit to worker
- Other IH practices
- Laboratory selection

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## Direct Exhaust Sampling

- Test Protocols: steady-state sampling
- Applications:
  - Efficiency of control technology
  - Maintenance tool
- DEEP research examples

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## Measurement of the Efficiency of Exhaust Control Technology



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## Gauging the Impact of Maintenance - ECOM/UGAS



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## CO Monitoring in Exhaust



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## Conclusions

- Exposure monitoring for DPM in mines will see significant changes in the near future
- Sound knowledge of DPM sampling and analysis will be needed
- DPM and exhaust gas sampling can also help with engine maintenance and control technology evaluation

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## Collaborators



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## Sampling Report



- DEEP Technology Transfer Initiative
- Available in French and in English
- Hard copies at CANMET Table
- Web site: [www.deep.org](http://www.deep.org)

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