



MINE AIR QUALITY AND VENTILATION

THE CHALLENGE

Reducing harmful diesel emissions and optimizing mine ventilation systems are key to improving underground working conditions, while at the same time increasing productivity and reducing the cost of mine ventilation. Industry's growing interest in deep mining increases the importance of temperature control and optimizing mine ventilation.

NRCan CAN HELP

CANMET-MMSL has established a group of specialists in mine ventilation, ventilation automation, diesel-engine emissions control and certification, as well as underground contaminants monitoring and control. The goal for this area of research is to improve air quality and safety in the underground mine environment, and to evaluate approaches that may provide savings in both capital and operating expenses. CANMET-MMSL collaborates with mine operators, workers, suppliers and regulators to provide cost-effective underground and surface environmental technology solutions.

OUR EXPERTISE

CANMET-MMSL has developed a range of expertise through R&D activities:

- **Ventilation research**
 - Computerized 3D modelling of ventilation systems
 - Mine ventilation automation
 - Ventilation networks evaluation (air volumes, re-circulation, leakage, residence times) using tracer gas
 - Tracer gas contaminant surrogate applications (blast fumes clearance, methane and dust dispersion)
 - Stench gas emergency warning system evaluation using tracer gas
- **Diesel research**
 - Diesel engine and equipment certification (CSA, MSHA, ISO Standards)
 - Development of diesel emissions standards
 - Performance assessment of diesel emissions control technologies
 - Air and Exhaust Quality Index applications
- **Underground contaminants sampling and analysis services**
 - Diesel particulate matter sampling and analysis using NIOSH 5040 method
 - Airborne mineral dust (silica) sampling and analysis
 - On-site sampling of airborne dusts and gases

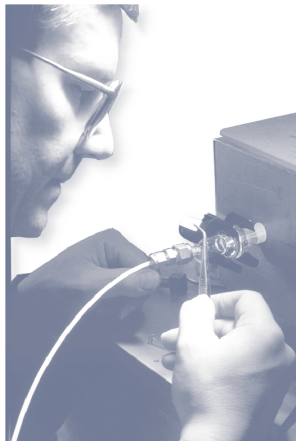


SUCCESSFUL PARTNERSHIPS

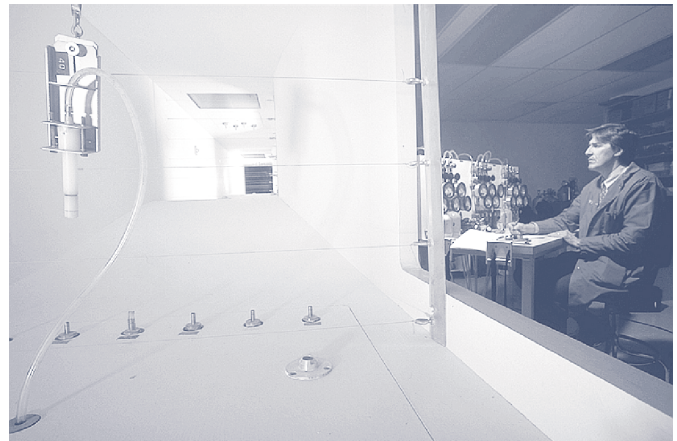
- In a mine ventilation automation project, CANMET-MMSL automated part of a mine so that individual diesel vehicles would be recognized on entry, and the ventilation infrastructure adjusted accordingly. At the same time, CANMET-MMSL acted as technical adviser in discussions with the provincial regulator who did not previously recognize Canadian diesel engine certifications, and also helped the mine to adapt its ventilation system to take into account diesel-engine certification. Once the regulator was persuaded that diesel particulate matter was much lower in modern engines, and accepted the Canadian diesel engine certifications, it determined that the mine ventilation system was adequate to open up a new area in the mine. This change in regulation allowed them to use modern engine technology and Canadian diesel engine certifications to develop new ore bodies with the existing ventilation infrastructure. A national standard has potential benefit for mining operations across the country.
- CANMET-MMSL chairs the Technical Committee of the Diesel Emission Evaluation Program (DEEP), an industry consortium whose goals are to reduce diesel particulate matter exposure in underground mines, and to ensure that future diesel regulation is based on sound science. CANMET-MMSL also undertakes research projects approved by the DEEP. The consortium is looking at promising technologies to lower emissions underground. Two current projects involve specific applications of high-efficiency filtration technologies.



XRD for silica analysis



Diesel particulate analysis



Dust wind tunnel

CONTACT US

CANMET-MMSL's goal is to help find sound, science-based solutions to operational challenges.

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