Diesel Particulate Matter Exposure of Underground Metal and Non Metal Miners

- Purpose is to reduce miners' exposure to DPM.
- Promulgated interim exposure level of 400 µg/m^3 in 2001.
- Final exposure level of 160 µg/m^3 by January 2006.

Diesel Particulate Matter Exposure of Underground Metal and Non Metal Miners

Stillwater Mining Company's Goal for DPM:

Reduce DPM to the lowest levels possible, applying new technologies as they become available.

Diesel Particulate Matter Exposure of Underground Metal and Non Metal Miners

- Stillwater Mining Company recognized the challenge to meet exposure levels outlined in the act.
- SMC initiated number of activities to reduce DPM
  - Doubled airflow through mine to >1.2M CFM
  - Partnered with NIOSH and MSHA to examine technologies that could reduce DPM
  - Isozone (Isolated Zone) Study to measure effectiveness of technologies
  - Worked with engine & filter manufacturers.

Stillwater Isozone Study

- Various technologies tested to verify DPM reductions as well as other gaseous emissions
  - Fuel additives and blends
  - Exhaust treatments
- Through NIOSH partnership and Isozone study, SMC determined that all mines are unique. What works in one location may not work in others.
- Study provided basis for SMC's direction forward.

Stillwater's Direction for Compliance

- Engine replacement
  - Electronically-controlled engines
  - Electronic governors
- Application of catalytic sootfilters.
- Increase frequency of engine tuning for emissions.
- Vehicle substitution with units that have lower emissions ratings.
- Apply technology to airstreams that strip ambient DPM from air.

Stillwater's Results

- Bio-Diesel
  - B10 blend tested underground for 1 month. Worked well without operating issues or increase in DPM.
  - Currently testing B20 bio-diesel in same area.
- Disposable Paper Exhaust Filters
  - Fragile & short operating life resulting in high operating cost.
- Successful application of passive & active catalytic sootfilters Increasing application to equipment.
- Reviewed pilot electrostatic precipitator to determine effectiveness of removing DPM from airstreams.