

TABLE V-12.—31-MINE STUDY DPM CONCENTRATIONS ($\mu\text{g}/\text{m}^3$), BY MINE CATEGORY

	Metal	Stone	Other N/M	Trona
Number of Samples	116	105	83	54
Maximum	2581	1845	1210	331
Median	491	331	341	82
Mean	610	466	359	94
Std. Error	45	36	27	9
95% CI Upper	699	537	412	113
95% CI Lower	522	394	306	75

Chart V-5 compares the means from Tables V-10, V-11 and V-12. The mines selected in the 31-Mine Study (Table V-12) were not randomly selected and is therefore not considered representative of the underground M/NM mining

industry. Additionally the industry has continued to change the diesel-powered fleet to low emission engines that reduce diesel particulate matter exposure. Workers inside equipment cabs were not sampled during the 31-

Mine Study due to possible interference from cigarette smoke. Personal samples taken inside cabs were not avoided during baseline compliance assistance sampling.

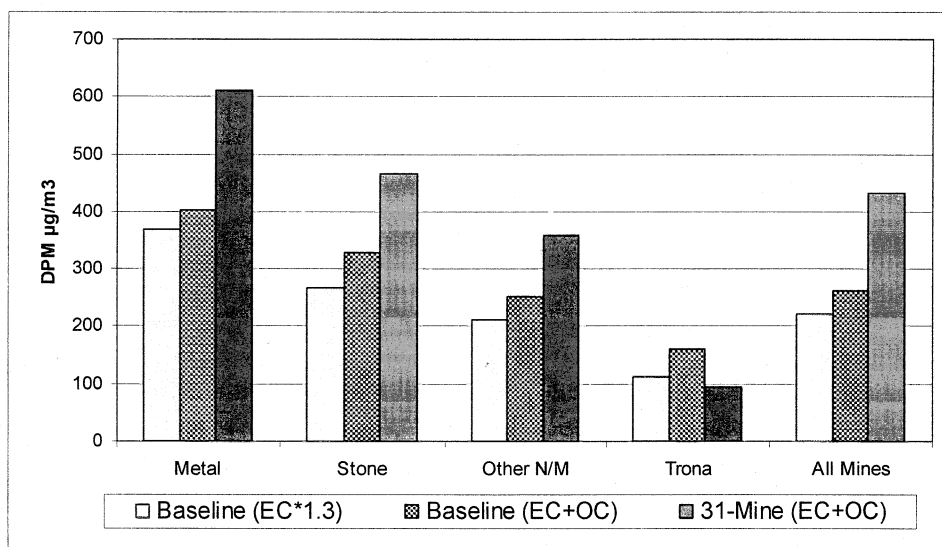


Chart V-5. Comparison of Mean DPM Levels from Baseline Sampling and the 31-Mine Study

B. DPM Control Technology

In addition to conducting baseline DPM sampling at underground metal and nonmetal mines, MSHA participated in a number of compliance assistance activities directed at improving sampling and assisting mine operators with selection and implementation of appropriate DPM control technology. Some of these activities were directed to a segment of, or the entire mining industry. Others were conducted on a mine specific basis. In general, those activities directed toward a large number of mines included outreach programs, workshops, Web site postings and publications. Those activities directed at an individual mine included evaluation of a specific control technology, a review of the technology in use, or that would be available at a specific mine.

Regional DPM Seminars. During September and October 2002, MSHA conducted regional DPM seminars at Ebensburg, PA, Knoxville, TN, Lexington, KY, Des Moines, IA, Kansas City, MO, Albuquerque, NM, Coeur d'Alene, ID, Green River, WY, and Elko, NV. These full-day seminars were offered free of charge in the major underground metal and nonmetal mining regions of the country to facilitate attendance by key mining industry personnel. The seminars covered the health effects of DPM exposure, the history and specific provisions of the regulation, DPM controls, DPM sampling, and the DPM Estimator, which is an interactive computer spreadsheet program used for analyzing a mine's DPM sources and controls.

NIOSH Diesel Emission Workshops. MSHA staff participated in two NIOSH

Diesel Emissions and Control Technologies in Underground Metal and Nonmetal Mines in February and March 2003 in Cincinnati, OH and Salt Lake City, UT. These workshops provided technical presentations and a forum for discussing issues relating to control technologies for reducing miners' exposure to particulate matter and gaseous emissions from the exhaust of diesel-powered vehicles in underground mines, and to help mine managers, maintenance personnel, safety and health professionals, and ventilation engineers select and apply diesel particulate filters and other control technologies in their mines. Speakers represented MSHA, NIOSH, and several mining companies, and ample time was provided for questions and in-depth technical discussion of issues raised by attendees.