

Carmeuse North America DPM Comments

Carmeuse Lime & Stone, Inc. (part of Carmeuse North America) operates two underground limestone mines in northern KY. Carmeuse North America is the largest lime producer in the United States. The two Kentucky operations (Maysville and Black River) produce approximately 7-million tons per year of calcine-able limestone for captive lime plants. Together the mines employ approximately 200 employees and both mines are highly dependent upon diesel equipment, and are impacted by the proposed DPM rule. The Maysville Operation in Mason County, KY has been in operation for 30 years, and the Black River Operation in Pendleton County, KY has been in operation for 40 years. There is currently no means by which these mines could have operated or continue to operate without the diesel equipment utilized by them.

Carmeuse is committed to aggressively protecting all personnel from hazards in the workplace, including any hazards that might be posed by diesel exhaust. Carmeuse supports sound regulations and fair enforcement that furthers safety and health in the metal/non-metal mining industry. Carmeuse continues to strive for no lost-time-accidents throughout all of its facilities. The Maysville Operation has operated with one or no LTA's for the last 4 years; and the Maysville Plant was a 2004 recipient of the Sentinel of Safety award. Annual hearing and pulmonary testing is conducted for all mine and plant employees.

The metal/non-metal mining industry has worked closely with MSHA to develop a better understanding of the issues presented by DPM in the underground environment, and to develop and evaluate various methods to control or limit DPM emissions. Carmeuse has moved forward aggressively on several fronts to determine appropriate methods to meet and maintain compliance with the current, negotiated 400 ug/m³ DPM level (308 ug/m³ with the compliance level expressed as elemental carbon). Carmeuse was one of the pioneers in utilizing alternative diesel-fuel blends when much of MSHA's compliance focus was on DPM filters. Little information was provided on alternative fuels during early compliance meetings/briefings as the focus was given to exhaust filtration. Carmeuse conducted many tests involving fuel blends and provided MSHA Tech Services with great opportunities to do concurrent testing. The testing shows the positive results of the blends, but it is the day-to-day usage that brings out the negatives.

A brief review to demonstrate the impact of the efforts that have been undertaken is in order. Carmeuse has made changes to maintenance programs; retrained personnel in both the production and maintenance departments; purchased new, more fuel efficient mobile equipment to replace otherwise adequate equipment; improved air flows within the mines and air quantity delivered to the mines; and switched to more costly and problematic alternative fuels.

As mentioned earlier, one significant activity Carmeuse has undertaken is to study the efficiency of alternative diesel fuel blends for DPM reduction. Two organic diesel fuel blends and a water emulsified diesel fuel blend were tested in the two underground

mines. The organic testing involved the use of biodiesel blends, specifically yellow grease and virgin soy-based. Also as mentioned, MSHA was invited to participate in the studies; the agency has penned several reports that describe the studies and analyze the fuel blends' impacts on DPM emissions. Carmeuse tested, and is now using, PuriNox, the water emulsified diesel fuel (since Jan. 2004). According to the sampling data, all these fuels produced measurable reductions in DPM emissions at the mine exhaust openings. However, the data alone does not demonstrate compliance with the interim limit as these are fully diluted values, i.e., most of the incoming fresh air has mixed with the diesel exhaust from each working area. The regulation requires that compliance samples be "personal samples", those collected in the breathing zone of individual employees. Therefore, the data represent an interesting trend, rather than an actual demonstration of compliance. Both internal and external personal DPM sampling shows that the mines are currently in compliance with the interim DPM limit, but not with the proposed final 160 DPM limit.

The impact of these various fuel blends must be evaluated in light of other factors such as the operational impacts. Information regarding increased fuel consumption, additional costs for the blends, increased downtime, increased maintenance costs, and the impact of power losses resulting from the use of the blended organic fuels was provided to MSHA in September 2003 at a public hearing in Pittsburgh, PA. The results expressed then are similar to the current conditions experienced with the PuriNox fuel blend. However, Carmeuse is finding that the PuriNOx is not an acceptable fuel for use in Tier 3 diesel engines. The engines will basically not run on the emulsified fuel and the Tier 3 engine equipment has been switched back to low-sulfur diesel fuel.

During initial usage of PuriNOx at Maysville in 2004, approximately 93% of the mine was operating on PuriNOx based on fuel usage. During the second-half of 2005, the amount of low-sulfur began increasing due to newer equipment so that only 69% of the fuel consumed at Maysville was PuriNOx. The overall 2005 average was 82% PuriNOx used. For 2006, the usage has shifted to approximately 44% PuriNOx as more equipment with Tier 3 engines is brought on-line. Dual fuel handling imposes additional costs and barriers on the operations. The fuel handling system for Maysville is not suited for this balance of fuel usage – 80% PuriNOx and 20% low-sulfur is more realistic, which is causing delivery, cost, and servicing issues.

It should be noted that the Tier 3 engines do not provide significant DPM emission reductions their purpose is to reduce NOx emissions. Additional DPM reductions related to engine performance do not occur until Tier 4 engines are implemented, and USEPA Tier 4 emission standards do not become effective for the high horsepower engines until around 2011.

Use of PPE for compliance is an issue which should be carefully reviewed, and not cavalierly discarded. Carmeuse experience tells that occasions will arise during which personal protective equipment (PPE) will be the best method to address the DPM levels. At the Maysville Mine, there are occupations, such as a roof bolter, which require personnel to work outside of the cab, near the back of the heading. The use of PPE such

as air filtering helmets and face shields as an optional primary means of compliance will achieve the objective without extraordinary efforts to move more air into areas where few personnel are exposed. This diversion of air deprives other working areas of fresh air that may allow a larger number of employees to work in air that otherwise would meet DPM limits. The movement of this air is also expensive and not always technically feasible. For example, the use of PPE to achieve the compliance level may offset the installation of an additional 16-foot diameter airshaft at a cost of \$1000 per vertical foot. The Maysville Mine lies 800 to 1200 feet below ground, depending on the location where a new air shaft might be located. The cost of the shaft alone would be \$800,000 to \$1.2-million, and when ventilation fans are included that are required to move the air the cost approaches \$1.5-million.

Maysville has developed and mined over 1100 acres of reserves, and this requires air to be coursed through the mine at distances up to 1.5 miles. The mine currently circulates 850,000 cfm through two 425,000 cfm air splits using numerous airwalls/stoppings, 12 auxiliary/booster fans, and four permanent fans. As mentioned above, adding additional air is not an inexpensive task, and developing a site for an air shaft takes time and many resources.

Turning to the question of a “single sample” for compliance, Carmeuse does not believe that a single sample will fairly represent the then current situation and that the method has not been proven accurate and feasible. This is clearly illustrated by examination of the data presented by MSHA in one of its papers, **Diesel Particulate Concentrations from Diesel Particulate Matter Studies at the Carmeuse North America, Inc., Maysville Mine, Mine I.D. No. 15 07101, Maysville, Kentucky**, August 29, 2003. During the initial baseline and biodiesel studies, MSHA and Carmeuse had samplers hanging “side-by-side” in several “personal” applications; at the return air locations, MSHA had two samplers beside a Carmeuse sampler. The variation in the averages between the samplers ranged from almost none to as much as 51%. The sampling environment where the greatest variation was obtained (one each sampler) was inside a cab on a new piece of equipment (CAT 988G loader). The next greatest variation, 40% at the exhaust slope, as well as the least variation, 1.5% at the exhaust shaft, occurred at very stable platforms, all pumps (two MSHA and one Carmeuse) hanging on a stand in the mine opening. The distance between sample pump intakes was less than 18 inches. These types of variations cause Carmeuse great concern as compliance testing is implemented. How can a single sample be considered accurate for compliance or non-compliance when there is such variability? In addition, MSHA has admitted that the relationship between elemental carbon and total carbon is not stable and varies from mine to mine, day to day, and place to place within a mine, in a statically significant manner. Once again, how can a single sample be considered accurate for compliance or non-compliance when there is such variability? Dr. J. Borak from the Yale University School of Medicine, a world recognized expert in toxicology and risk assessment, has expressed serious concerns that measuring diesel exhaust at low levels, measuring TC, and measuring the 160 PEL, are neither feasible nor accurate. Now, how can future sampling for lower compliance levels be considered accurate?

The most controversial portion of the proposed regulation, a PEL of 160 ug/m³, is unsupported by sound scientific data. Preliminary data releases from an ongoing study, being conducted by NIOSH/NCI of 14,000 miners involving sampling access and extensive records access for miners using diesel equipment since it was originally introduced into mining 30 plus years ago, have NOT demonstrated that there is excess cancer or disease found among our miners. This comment, made by Dr. J. Chase, who has evaluated the data on behalf of MARG, is contained in the rulemaking record. The NIOSH / NCI study is expected to be completed in 2006-7. The results of the study are what should be driving the rulemaking - not MSHA selecting levels that are perceived to be achievable. Industry is in need of solid evidence in order to be supportive of the DPM regulation. The costs, compliance difficulties, and violation risks make this a very serious rule that must be based on sound science. There is also much uncertainty that increases the difficulties associated with compliance and the risk of being in violation. As far as costs go, the Maysville Operation has spent an extra \$230,000 on the PuriNOx fuel, with each gallon costing approximately \$0.08 more. These fuel costs do not reflect the cost of issues associated with engine repairs, engine changes, and other compliance costs.

Carmeuse asks that MSHA consider these comments during its deliberations on the rule. The current negotiated standard (308) is difficult and costly to achieve and maintain, but Carmeuse is committed to doing so. As to the matter of a final DPM PEL, Carmeuse sees no justification for a 160 ug/m³ standard, and asks that it be revoked until sound scientific data proves otherwise (NIOSH/NCI study). Carmeuse also requests that MSHA reconsider the “single sample” for compliance as gathered data, in conjunction with MSHA personnel, clearly show problems with this concept. The conversion factor at lower DPM levels also needs to be fully understood before a 160 level is stayed. Not only does the level need to be based on sound science, but the measuring methodology needs to be soundly based. There is too much at stake for this rule to be implemented otherwise.

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