

**Safety In Mines Research Advisory Committee
Project Summary : SIM 020605**

Project Title:	An Investigation into the Surface Activity of Airborne Particles in the Gold mining Environment (48 pages)
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Report Date:	26-4-2007	Related Projects:	
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Category:	Particle Toxicology	Applied Research	Yes
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Summary

Surface activity of representative settled bulk mine dust samples collected from ten mines located within three provinces in South Africa as well as their < 20 µm size-separated fractions were studied using a number of *in vitro* test systems. These included the ability to generate the hydroxyl radical, to initiate lipid peroxidation and also to induce damage to DNA. The physicochemical properties such as surface area, elemental composition and α-quartz content of these particles were also assessed. It was found that dust samples collected from these mines and their size-separated fractions were not equal in initiating these toxic reactions. Accordingly, it is proposed that equal masses of these dust particles will not translate into equal doses of exposure. Recommendations are therefore made to take this variability in toxicity of mine dust in establishing a more relevant dose response relationship of exposure to pathological effects. Additional toxicological tests involving the assessment of surface elemental contamination of dust particles with iron will further assist in establishing the latter relationship.