Laboratory and Field Performance of a Respirable Personal Dust Monitor

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Review Comments:

1. Page 2 – Check whether the ISO respirable convention is identical to the one proposed by Solderholm – my recollection is that it is subtly different (but I may be mistaken).

2. Page 4 – A question, rather than a comment – are there safety issues with Li-Ion batteries being used underground, given the need for complex power management systems to prevent them exploding/igniting?

3. Page 5 – The description of the momentum compensator is very unclear. More clarity and a citation would be helpful here.

4. Page 6 – Was the dust generated into the Marple chamber neutralized? How was this checked? What was the aerosol uniformity within the chamber? What was the flow rate through the chamber?

5. Page 8 – Impactor data. Just to confirm – I assume no inversion routine was used?

6. Page 14 and 15 – There seems to be quite a large difference in aerosol MMAD between the pre-mine and post-mine PDM evaluations. What was the variance in aerosol size distribution (variance in measured MMAD would be sufficient I think)?

7. Page 15 – Was K0 just measured before testing in mines? Can anything else be said about possible calibration drift with PDM use?

8. The acronym PDM is used by Grimm Technologies for their optical particle counter. The authors may wish to consider another acronym to avoid confusion.

9. I recommend that many tables be moved to the appendix. For instance, Table 2, 3, 7, and 8 are raw data and do not need to appear in the body of the report.

10. Also, I suggest that Table 4 be converted into a figure. The reader does not need to know what PDM # corresponds with what data. Thus, unit number is irrelevant in all tables.

11. The definition of accuracy, bias, and precision is inadequate on page 11. I should not have to look up the Kennedy et al. article to know what accuracy is in reference to. A basic definition of each term should be supplied for the reader in this section. Also, there seems to be inconsistencies in the use of these terms in

the manuscript. I suggest that both the results and discussion sections start with specific paragraphs that directly deal directly with each of these items.

12. The bias paragraph (p22) and the precision paragraph (p23) are probably the most important paragraph in the manuscript. For this reason, I suggest moving them to the beginning of the discussion section. It should start by restating the observed bias, which is difficult to ascertain from the results section.

13. Title, suggest adding 'real-time' to title. The real-time aspect is what sets the instrument apart.

14. Fig 1, I believe that the cap holds the light as well as the inlet. The light should be identified on this figure, if so.

15. Fig 8, I do not understand how cumulative mass concentration can decline during a run. There are some strange lines on my figure that do not look like they belong in the cumulative data. Perhaps this second issue is a problem with the pdf.

16. Abstract, Text says that "The dust monitor is an integral part of the cap lamp that miners normally carry…" But, only the inlet is an integral part, so this statement is somewhat misleading.

17. P8, discussion of filter blanks is confusing. Authors state that blanks 'could not' be weighed at the same time as filters? I suggest that they 'should have been' but 'were not' weighed at the same time.