Western – Metropolitan Rail Systems Coal Dust Monitoring Program

Independent Peer Review

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Summary of the Report

The report summarises the results of a study, commissioned by the Queensland Resources Council and undertaken by members of Environmental Monitoring and Assessment Sciences, Science Delivery Division, Department of Science, Information Technology, Innovation and the Arts of the Queensland Government, dated September 2013.

The focus of the study was twofold:-

- to evaluate the contribution of coal dust from coal train movements through the suburbs of Brisbane to potential health and nuisance impacts and
- to assess the efficacy of a coal dust mitigation procedure of profiling and veneering for loaded wagons.

The study comprised initial monitoring at six locations, chosen for their location on coal transport lines and for access to historical data sets if needed, and a background location across the Western and Metropolitan rail system for a short period, followed by the continuous monitoring for a 12 month period at one location on the Metropolitan rail system. This review refers to the report on the initial study.

Although the study was impacted by unexpected rainfall events and equipment failures, it concluded the following

- accepted health criteria were not breached and there was no clear evidence that emissions of coal dust from loaded or unloaded carriages contributed significantly to the health-based indicators PM_{10} and $PM_{2.5}$;
- there is evidence that coal train movements contribute to dustfall and therefore potentially to nuisance or degradation of amenity, but that the guidelines established by the New Zealand Government for such matters were not exceeded; and
- there is evidence that profiling and veneering reduce the amount of coal dust deposited from passing trains.

Review of the Report

1. The monitoring program adopted in this report is a reasonable and acceptable method of addressing the aims of the study; the monitoring equipment was operated using standard procedures in all but one case, that of dustfall assessment, for which adequate care was taken to ensure that the variations would have no significant effect on the determinations.
2. Background information is well referenced, including online sources available to the general public; dates of access to this information have also been included.
3. Background information on the generation and properties of airborne particulates in relation to potential health and amenity impacts is appropriate and accurate.
4. Operational difficulties encountered during the monitoring program reduced the amount of data collected; despite this the data include clear signals that support the conclusions drawn.
5. The possible impact of unusual meteorology indicates that the study needs to be extended as proposed.
6. There is no evidence of impact of coal particle emissions associated with independent train movements on health criteria. It is noted that monitoring sites were placed close to transport corridors rather than in the community; dispersion occurring as air parcels are transported by wind movements into community areas would further decrease particulate concentrations.
7. There is evidence that nuisance dust levels are increased as a result of train movements. This could be noticed by a sensitised local population even though the (one) quoted set of alert levels (New Zealand) is not triggered.
8. Although it would not alter the overall conclusions of the report, it is noted that in the choice of monitoring sites, the methodology is biased towards assessing the impact on the community, rather than the efficacy of the proposed mitigation procedures. The latter would seem to be more likely to be best addressed from a focus on the results obtained at Oakey and Willowburn monitoring sites, where external impacts from regional sources would probably be less than would occur at the metropolitan sites.
9. The determination of the impacts of train movements on the surrounding community could benefit from the inclusion of community complaint statistics, if these were available.
10. Attention to the following information would add completeness to the report:-
    - The lack of overhead power line infrastructure in the Oakey and Willowburn photographs indicates that the locomotive power for the trains was diesel. Emissions for the diesel exhausts would be expected to be detected by the monitors it would be an advantage to have known if the number of engines was the same in each train.

- The location of the monitoring site and the data collected there indicate that this site could be useful in determining the effect of veneering as a dust mitigation procedure, and consideration could be given to including this site, as well as a metropolitan site, in the extended monitoring program.
- The number of wagons in each train would be expected to affect the coal dust and other emissions; it is not known if the lengths of the trains were consistent.
- As mentioned above, the inclusion and analysis of community complaint data could add to the study.
- More detail could be included in relation to the statistical analyses referred to on page 27.
- The title in Table 5 “proportion of winds..etc” does not appear to relate to all the columns which it spans.
- Train speeds, which will potentially affect wagon and trackside emissions, are not included. It is therefore presumed that these are constant, but this may not be the case.

Conclusion

The study used appropriate methodology, experimental design and data analysis to reach its conclusions. The report is comprehensive and logical and is appropriately referenced. Conclusions which are drawn are supported by the data.

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