

Dustfall Monitoring and Pollution Control Objectives

The Ministry of Environment and Climate Change Strategy (ministry) reviewed the use of dustfall monitoring in *Environmental Management Act* authorizations. Based on the review, the ministry considers dustfall monitoring and the dustfall Pollution Control Objectives as outdated methodology/criteria and, with the exception of specific limited circumstances, is no longer recommending or supporting their use based on the following reasons:

- The BC dustfall objectives were originally developed under the old BC Pollution Control Objectives (PCOs) back in 1979 as a 'soiling index' or method of assessing the "dustiness" of an area from an aesthetic or nuisance perspective. Their effectiveness for determining impacts on human or environmental health (soil, water, vegetation) is extremely limited.
- The PCOs were rescinded in 2006, although the dustfall objectives were retained on the BC air quality website "for reference purposes".
- Dustfall sampling methodology (passive open canister exposure) does not perform well (severely underestimates) during high wind events (often associated with fugitive dust).
- Dustfall monitoring is often used around mining projects with the stated intention of tracking metals impacts associated with fugitive dust. However, results are poor indicators for metals effects monitoring as there is no indication of the bioavailability of any metal contained in the samples and no established relationship between deposition rates and protection of soil, water or vegetation health.
- Dustfall results cannot be used for dust episode management actions as the 30-day sample periods (and subsequent laboratory analyses) are too long to be of any use for this purpose.
- While dispersion modelling may assist with determining the possible affected areas from fugitive dust generated during mining operations, the modelled concentrations are highly uncertain due to the poor quality of the model inputs, namely simplistic emission factors, added to the inherent uncertainties and limitations in modelling dust dispersion and deposition. This is particularly the case with road dust.

Based on the rationale above, it is suggested that before requiring dustfall as a component of any assessment process or inclusion within a regulatory authorization, that the objectives of the monitoring and/or dust management plans be clearly defined. Some possible considerations:

- If the concern is simply one of an aesthetic or nuisance nature, the use of dustfall monitoring and the objectives may be justified, with careful selection of the appropriate criteria, e.g.
 - 'residential/parkland' PCO (1.75 mg/dm²/day),
 - 'industrial/other' PCO (2.90 mg/dm²/day), or
 - facility/site specific deposition rate.
- If the objective is to protect human health (i.e. nearby human receptors), monitoring of PM_{2.5}/PM₁₀ would be more appropriate, including compliance with associated Ambient Air Quality Objectives.
- If the objective is to protect the soil/water/vegetation and/or tracking accumulation of metals or other contaminants in the environment, including impacts to 'country foods', sampling of the specific media of concern would be more appropriate and specialists from the related disciplines should be involved in the development of baseline and on-going monitoring programs and determination of protective criteria.
- For episode management of fugitive dust, continuous monitoring of TSP or PM₁₀ would provide more timely information for triggering actions under a dust mitigation plan.
- If there are concerns regarding other emission sources and possible impacts to ambient air quality and the environment, the emissions/impacts should be characterized, assessed and the appropriate monitoring determined.

When dispersion modelling is used in an assessment, the B.C. modelling guidelines recommend that a modelling plan be developed with input and subsequent sign-off from an Air Quality Meteorologist at the ministry; it is recommended that a similar approach be used when developing baseline monitoring plans used to support assessments, compliance monitoring programs, or permit monitoring clauses. Proponents and permitting staff should consult with Air Quality Meteorologists at the ministry to determine the contaminant(s) of concern, the monitoring methods, sampling locations and air quality criteria to be used.

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