

Central Hawkes Bay District Council Dust Mitigation Guidelines

1. Background

Council own and operate a 403km network of unsealed roads across the district that are maintained and serviced to a standard in line with national ONRC guidelines. NZTA provide funding assistance to operational and capital expenditure on these roads as per programmes of investment that are created by Council, based on risk and aligned with NZTA criteria.

Dust is one of several issues that Council manages on its unsealed road network and in the past two years has invested in trials of new and existing products to mitigate dust levels in problem areas. NZTA provide a mechanism for Council's to obtain funding assistance for dust suppression (either through sealing or other means), but strict criteria need to be met. Council are confident through experience that none of our roads meet the NZTA criteria for dust-related funding assistance with this primarily due to low population densities on unsealed roads and low traffic volumes.

The cost of a seal extension is approximately \$250,000 per kilometre. There are several components to a seal extension;

- base course strengthening
- stabilisation and
- sealing

A second seal coat is required 2-3 years after the initial sealing to waterproof the seal extension. The actual sealing portion of the seal extension is around 5% of the total cost.

Council contribute to the physical and financial delivery of dust suppression through sealing in line with the Dust Suppression Policy 2019 (insert Policy ref).

2. Objective

The objective of these Guidelines is to set out, in a clear and transparent manner, Council's guidelines for considering seal extension requests from ratepayers and/or residents. It will outline how and when Council will enter into arrangements with ratepayers and/or residents to ensure consistency, fairness and equity and in line with the Dust Suppression Policy 2019.

3. Factors (FIDOL)

The nuisance effects of dust emissions are influenced by the nature of the source, sensitivity of the receiving environmental and on individual perception. For example, the level of tolerance to dust deposition can vary significantly between individuals. Individual responses can also be affected by the perceived value of the activity producing the dust. For example, people living in rural areas may have a high level of tolerance for the dust produced by activities such as ploughing or top-dressing, but a lower tolerance level for dust from quarries or logging activities.

Whether a dust event has an objectionable or offensive effect always depends on the frequency, intensity, duration, offensiveness/character² and location of the dust event. These factors are collectively known as the FIDOL factors and are described

in table 1 below.

Different combinations of these factors can result in adverse effects. Location is particularly important as this relates to sensitivity of the receiving environment.

¹ Plus ongoing maintenance. ² in this context, offensive is one consideration in whether there is an 'objectionable or offensive' effect occurring as a result of exposure to dust.

Factor	Description	Measure
Frequency	How often an individual is exposed to dust	Provide diary (Appendix A)
Intensity	The Concentration of the dust	Dust deposition test
Duration	The length of exposure	Traffic
Offensive/Character	The type of dust	Receptors
Location	The type of land use and nature of human activities in the vicinity of the dust source	Site Characteristics

Table 1

These factors require a form of measurement to be useful as a way of determining the acceptability of a seal extension proposal by either an individual or group of local residents. The following looks at each of these factors and how they will be measured.

4. Dust Impact Diary

Dust diaries can be used by people in affected communities to record their daily exposure to dust. A dust diary programme can be useful for collecting data on the frequency, intensity, duration, and character of dust impacts at various locations over a given period. They can help to inform a FIDOL assessment to evaluate the overall level of adverse effect from a dust source. Dust diaries generally need to be completed for at least three to four months to provide meaningful information. If there are sufficient respondents and spatial coverage, the resulting data can be used to calculate the percentage of time (hours/year) that people are exposed to dust from a specific source. The information recorded in a comprehensive diary programme includes:

- date and time of day
- duration of the event
- continuity of the dust event
- character and amount of dust particles
- likely source of dust
- wind direction and strength.

5. Dust Deposition

Deposited dust is dust that settles out of the air. Measurement is by means of a collection jar or gauge that catches the dust settling over a fixed surface area over a fixed period of time. The dust is removed from the jar, filtered and weighed, and the results are reported in terms of the weight of dust collected per unit of surface area, and over a fixed period of

time,

The equipment used for deposition monitoring typically collects dust particles greater than about 10–20 micrometers, although there is no sharp cut-off in particle size and the collection efficiency is known to vary for different particle sizes.

The deposition gauge method is relatively simple and can provide an indication of long-term trends. It can also be useful for analysis of dust composition. This method has disadvantages including:

- the measurement period is typically one month and cannot be reduced to anything less than about 15 days without a significant loss in measurement sensitivity. This makes the method unsuitable for the monitoring and control of short-term dust problems
- the wide jar or gauge can be prone to contamination from other sources (eg, bird droppings and leaves).

Deposition gauge dust monitoring is generally not suitable for active site dust management. It may provide some data about the level of soiling nuisance but generally cannot identify the activity creating the nuisance (except where accompanied by source apportionment of dust deposited) or the effectiveness of any on-site dust mitigation techniques, except over very long time periods.

Dust gauges should be carefully sited according to AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment standard, having regard to:

- the risk of tampering or vandalism by members of the public
- the impact of nearby structures on wind flow (and thus dust collection efficiency), as required by the monitoring method
- proximity to other local dust sources (such as a private logging road) that may affect the measurement.

Trigger	Averaging period	Trigger Level	Risk Factor/ Score
Monthly	30 Days	4 g/m ² /30 days	5
Month	30 Days	< 4 g/m ² /30 days	0

6. Dust Deposition

The remaining risk factors and their scores are detailed in Table 2 below. The relative risk assigned to each factor listed in the table is based on a qualitative assessment of the findings from the road dust monitoring. These are basic criteria that are easily explained using a table.

Risk factor/Score	0	1	2	3	4	5
Traffic						

5 day AADT of HDVs	0	1-5	6-10	11-25	26-50	>50
Speed limit of HDVs (km/h)	No HDVs	20 km/hr	50 km/h or greater			
5 day AADT of LDVs	<100	101-300	>300			
Speed of LDVs (km/h)	<50	50-70	>70			
Receptors (within 80m of roadway)						
Number of dwellings (houses/km)	0	1	2-4	5-7	8-10	>10
Other locations where people are likely to be exposed. (eg, schools, marae, or hospitals) (sensitive locations)	None	1-2	3 or more			
Nuisance effects for residents (complaints/year)	None	1-2	3 or more			
Ecologically sensitive areas such as rare species habitats or wetlands (sensitive locations/km)	None	1-2	3 or more			
Horticultural sensitive areas such as fruit orchards (sensitive locations/km)	None	1-2	3 or more			
Site characteristics						
Location of roadway	Open plains or coastal area	Some land features likely to slow winds	Inland enclosed valley			
Frequency of rain days (>5mm)	More than 2 events per week	0-1 events per week	Less than one event every two weeks			
Longevity of logging route use	Not a logging route	1-2 years	Longer than 3 years			

Table 2

The site dust risk score is calculated by totaling the scores for each of the 14 individual factors. The site dust risk score will fall into one of three dust risk categories in Table 2, Table 3 provides a first order assessment on the potential benefits gained by mitigating that section of unsealed road. Finally, Table 3 indicates what action (if any) is needed to complete the decision-making process.

Total dust risk score	Dust risk category	Potential benefit from dust mitigation	Action to be taken
0 to 9	Low	Little or no benefit from mitigation	End of decision-making process

10 to 19	Medium	There may be some benefit from mitigation	Return to and repeat the 'site dust risk factors and scores' with refined site-specific information
20 to 30	High	There is likely to be a benefit from mitigation	Complete assessment of suitable mitigation options

Table 3

If the site dust risk falls into the low category, no further action is required. The actions required if the dust risk falls into either the medium or high-risk categories.

7. Funding

Council will consider its own contribution to funding in light of funds available, the criteria above and where external funding is available. Preference will be given to sealing sections of road where external funding streams are available. These could include NZTA, private funding or others.

Where 100% private funding is chosen, the following considerations will be given and will be communicated with the person providing funding:

The following requirements shall be met for privately funded seal extensions:

- The costs for a second coat of seal must be considered and agreed;
- The minimum length of road to be sealed shall be 100m;
- A per km rate will be agreed between Council and the funder prior to commencement of works;
- The timing and method of payment will be agreed between Council and the funder prior to commencement of works;
- The costs of ongoing maintenance will be agreed between Council and the funder prior to commencement of works;
- Council will provide a receipt for the funds received.

Council will use the current maintenance contractor to undertake the construction works unless otherwise agreed prior to construction. At the completion of the seal extension Council will advise the ratepayers and/or residents the total cost. Should the total cost be less than the funds provided by the ratepayers and/or residents, Council will refund the difference, once the second seal coat is completed.

8. Future Maintenance

The sealing of a road has to be maintained to restore its waterproofing properties and level of service. To do this the section of road has to be resealed within two to three years of the initial seal coat (second coat seal), and then resealed every 12 to 15 years after that. Resealing not only includes the actual resurfacing of the road, it also includes line marking, pothole patching and surface water channel maintenance.

The funds required to be provided by the ratepayers and/or residents shall also

cover the cost of a second coat seal to be undertaken within two to three years after the initial sealing.

Council will then take over and fund the maintenance of the road once it has been sealed including a reseal every 12-15 years. This is estimated to average around \$3,652 + GST per kilometre per year. Currently the on-going maintenance of a sealed road attracts NZTA subsidy.

Any future maintenance obligations will be undertaken by Central Hawkes Bay District Council under the maintenance contract.

