

RECENT DEVELOPMENTS IN THE ASSESSMENT, MONITORING AND MITIGATION OF DUST



Corby Steelworks
Corby
Northamptonshire
England
Decommissioning site
1985 to 1997



Stellar Cast



Chelsea – White
Lotus Season 3



Begbie –
Trainspotting 1 and 2

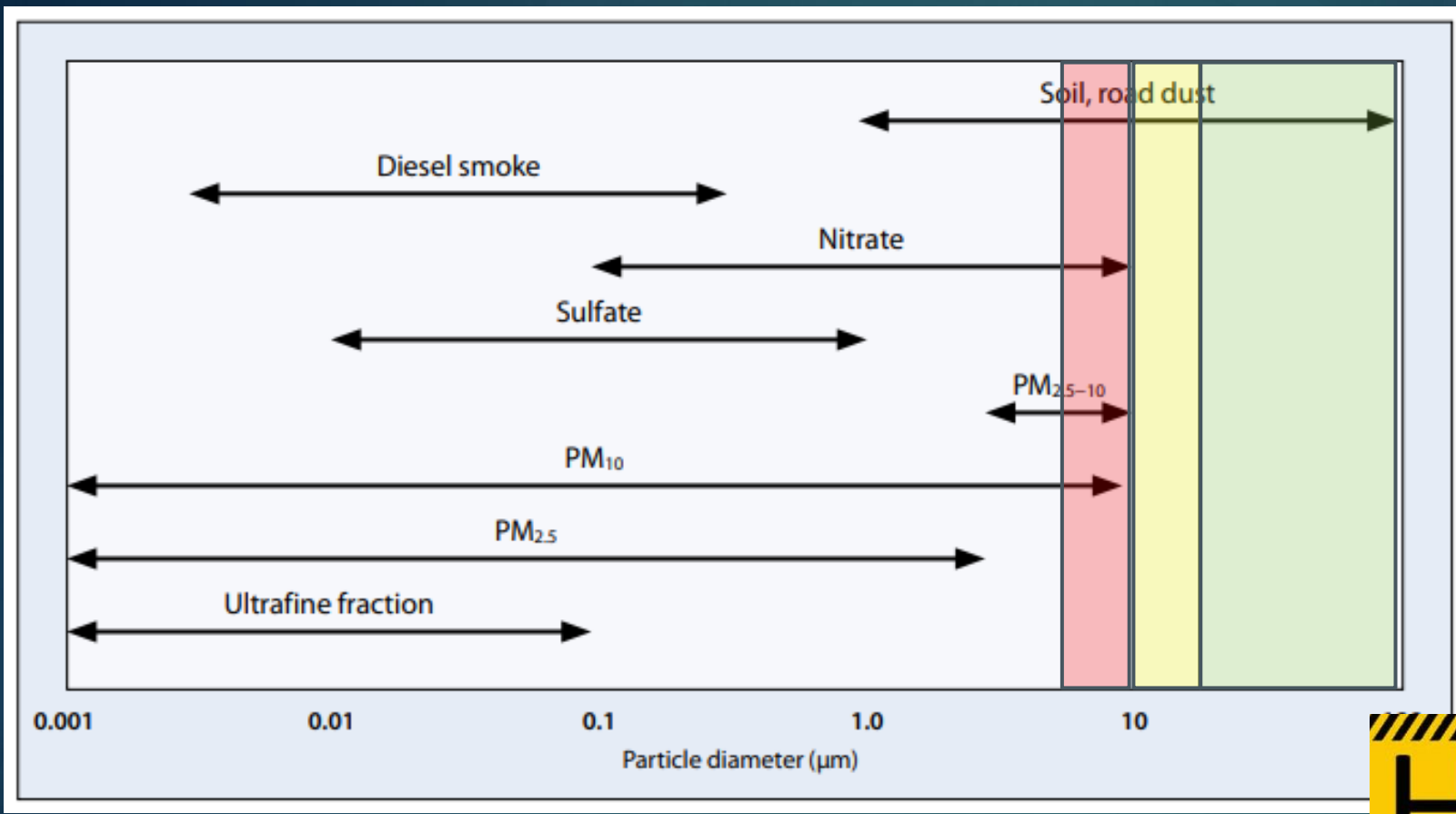


But the Real Star (Villian) of Toxic Town is ...

DUST!!!!



What is dust? - mechanically generated particulate

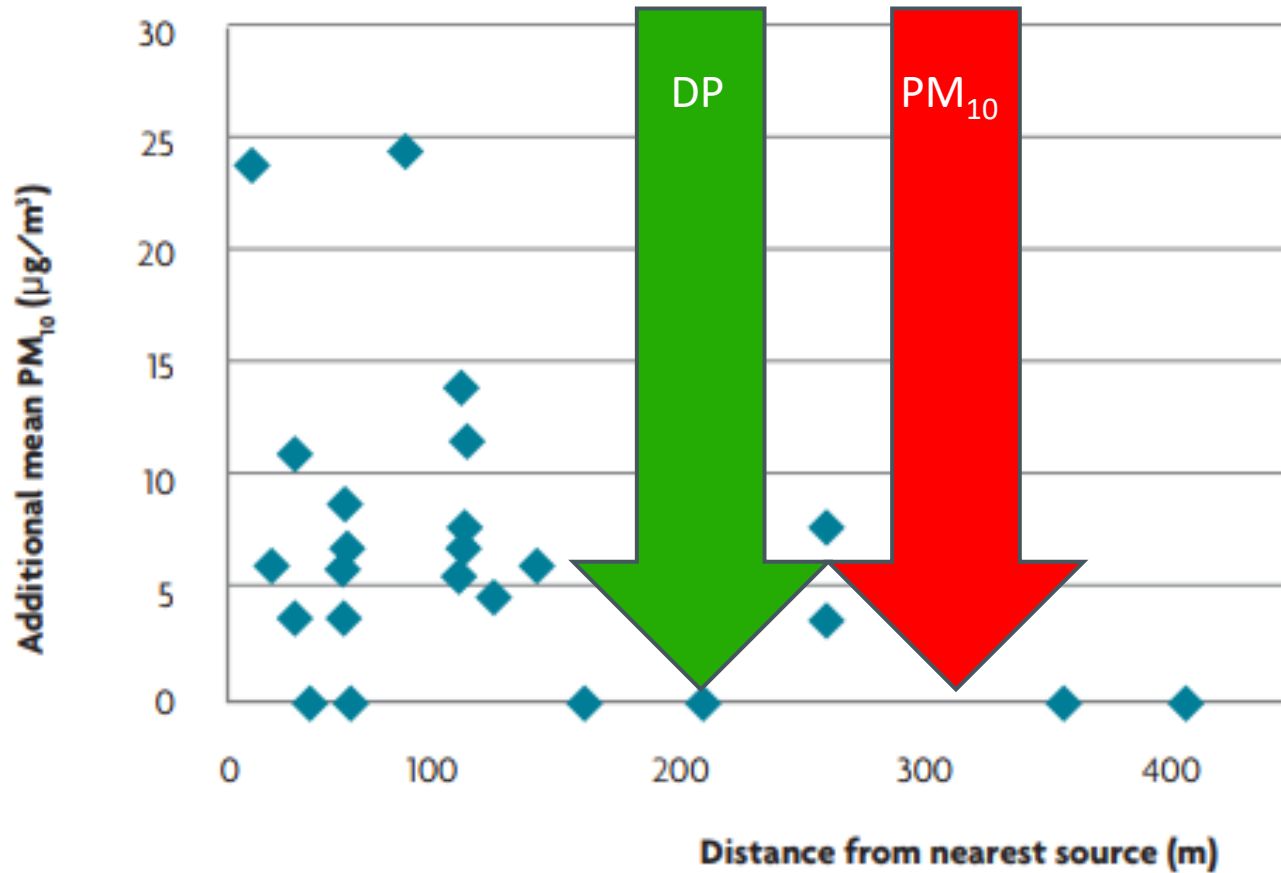


- Deposited dust
 - the real big stuff
- Total Suspended dust
 - middle sibling
- Fine inhalable or respirable fractions



of the

Dust Travel Distance



- PM₁₀ increment, all windspeeds downwind from quarry operations (IAQM, 2016)

300m? B***S**T Jeff!
What about dust
storms?

Damaging winds produced
by thunderstorms across
central New South
Wales have whipped up
dust storms that turned
daytime into night in some
towns. (January 2020)



What Effects Does Dust Have?



Te Whatu Ora – Dr Cheryl Brunton (Medical Specialist)

Pers. Com. 21/08/25

Original Statement in 2018

“Overall, the results show there is no serious public health risk to Yaldhurst residents from airborne dust,” he said. “Nuisance dust levels will not cause long-term health effects, but we know it can cause irritation and symptoms of concern in some people and we have prepared a factsheet with advice for residents.”

Proposed Revised Statement in 2023

Updated international and national research (WHO and HAPINZ reports) shows that exposure to PM₁₀ has the potential to impact public health in a more substantial way than has been previously understood.

New evidence shows that there is a strong association between exposure to PM₁₀ and adverse health impacts. The strength of this relationship depends on the frequency, amount and duration of exposure and the location/distance from the dust source.

An Emerging issue:
Respirable
Crystalline Silica
(RSC)

Accelerated
silicosis (Fear)

Mainly

engineered stone

One mining case

Aus



CDC

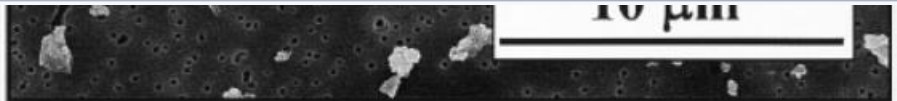
Silic
NIC

the asbestos of the 2020s.
So, what is silicosis? How big
is the problem? And is silica
really the new asbestos?

What silicosis is, and what
causes it
Silicosis is a long term lung
disease caused by inhaling
crystalline silica, a fine dust
naturally occurring in many
construction materials such as
stones, rocks, sand, bricks and
tiles. Silica is present in
particularly large amounts – up
to 96% – in engineered stone, the

to medical and
and safety experts
"It's causing
quicker than we
we're getting our
young workers."

What are the
Symptoms can
shortness of bre
tiredness. There
in the early stag
the disease spre
lungs, the more
breaths.
Silicosis shun



Crystalline silica used in this experiment. | Download

Scientific Diagram

Visit >

Tavern
Restaurant
Meals TAB
Gaming Machines

SKY

Wangler



**NO
QUARRY**

facebook.com/
Templeton Residents'
Association - NO QUARRY

**\$10
LUN
7 DA
11am -**





NO QUARRY
Opposition to Quarry Expansion
Residential Area

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On my way into the office one morning.....



How Do We Monitor Dust? Old School: Eyes, Deposition Gauges and High-Volume Sampler



Real-Time monitors – Solar power Moderate Cost



DUST MASTER PRO 7000

Real-time particle counter using laser technology for simultaneous PM monitoring of up to 5 PM fractions: PM₁₀, PM₄, PM_{2.5}, PM₁ and Total PM.

PERFECT FOR:

- Governments & Authorities
- Consultants & Engineering
- Civil & Construction
- Mining & Quarries
- Logistics, Ports & Terminals

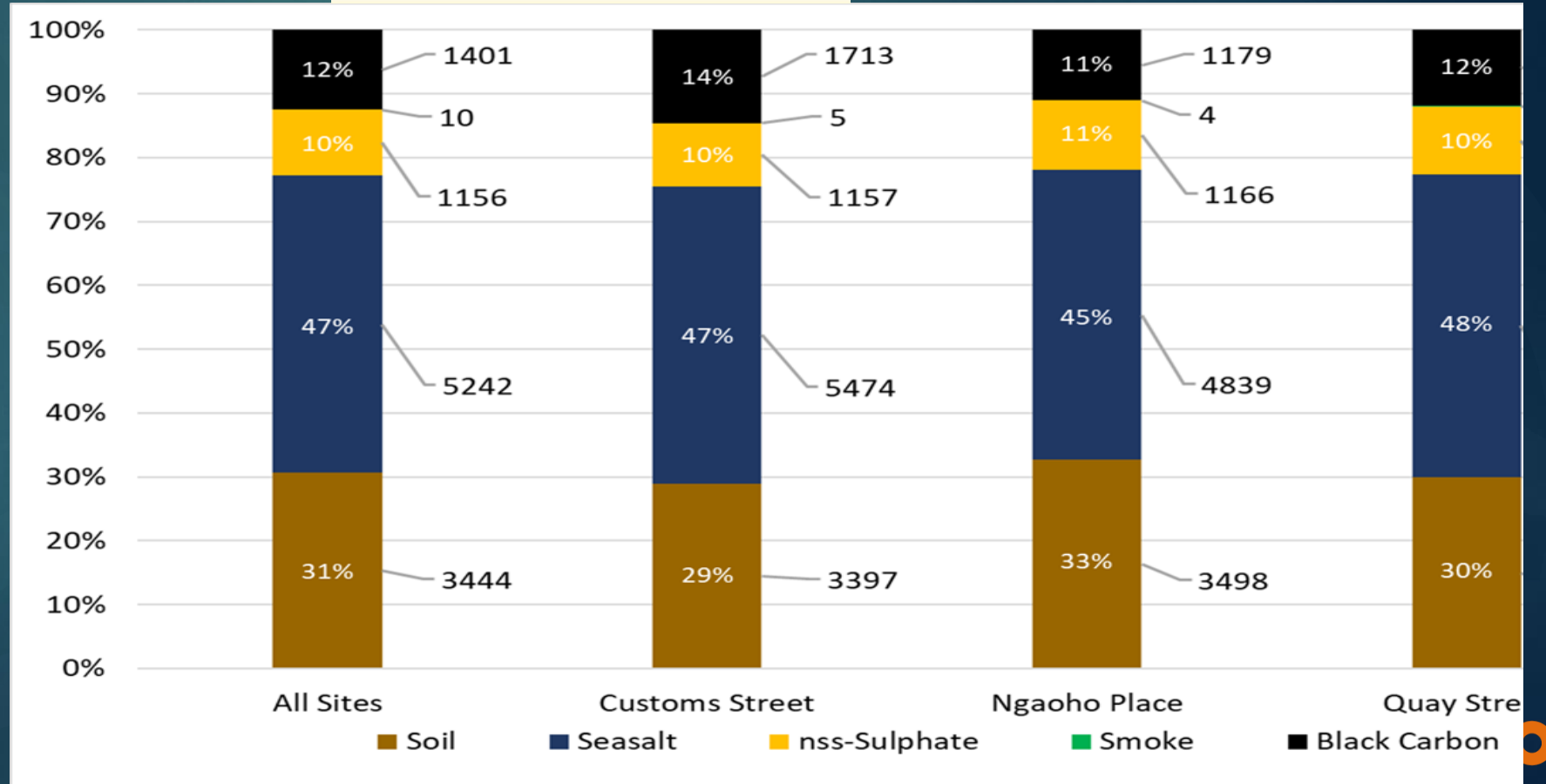


Trox Air XS - Real-Time RCS Monitor

- Independently Tested
- Reports in user-selectable time-weighted averages of 1 minute to 8 hours
- Alarms as user-selectable thresholds
- Instant Results on-screen
- Onboard data storage & dedicated Breathe XS software



Speciation and Morphology of Particulate



Toolbox - Mitigation of Dust

- 8.0 Reducing Dust Emissions**
- 8.1 Introduction
- 8.2 Site planning
- 8.3 Buffer zones/Separation distances
- 8.4 Water dust suppression
- 8.5 Site preparation, aggregate extraction, material handling and backfilling
- 8.6 Aggregate processing
- 8.7 Stockpiles
- 8.8 Haul Roads
- 8.9 Vehicle movements
- 8.10 Chemical dust suppression
- 8.11 Wind Barriers
- 8.12 Wind operation limits
- 8.13 Rating importance, effectiveness and cost of mitigation measures

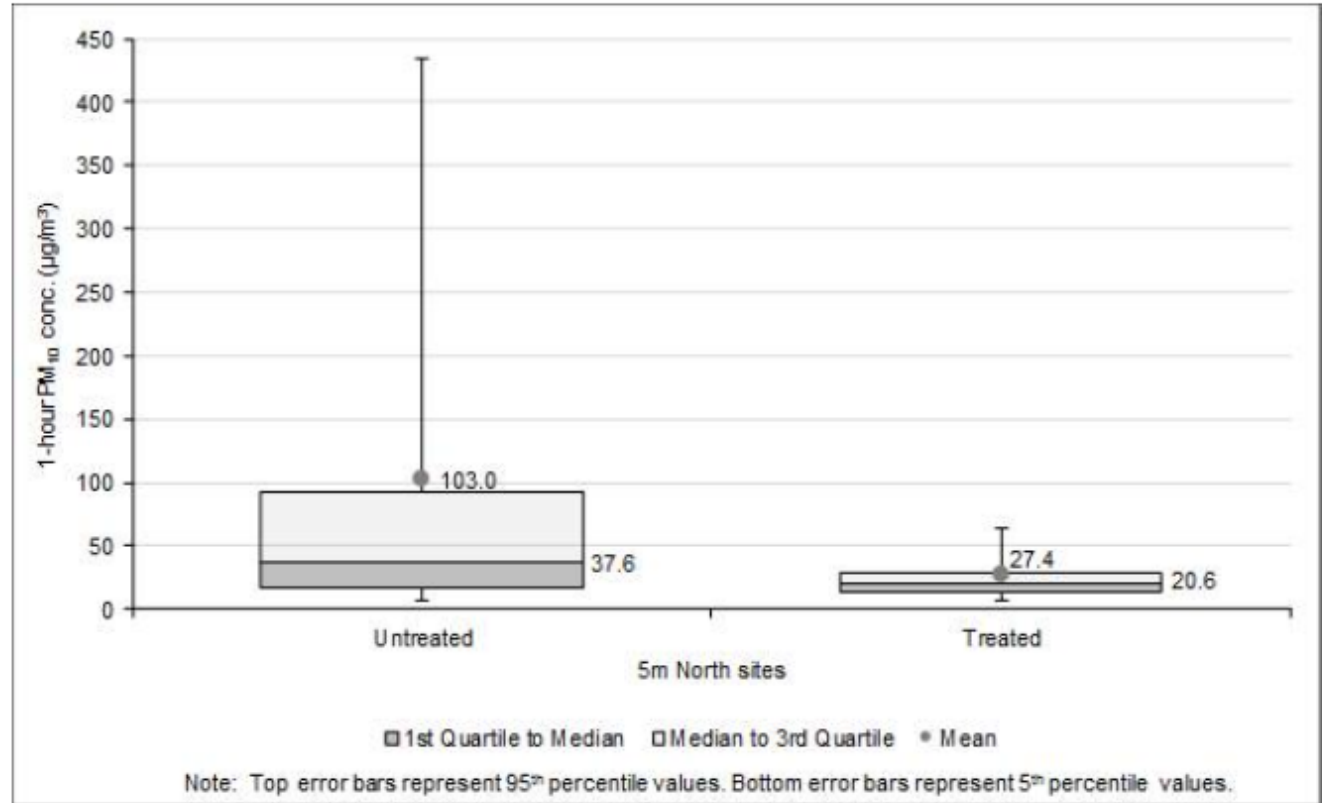


Chemical Suppressants (NZTA) also Shortage of Water

Figure 3.7 Application of magnesium chloride to Mataraua Road



Figure 5.1 PM₁₀ concentrations for the 5m north sites - untreated and treated sections of the road



Smart Monitoring and Forecasting



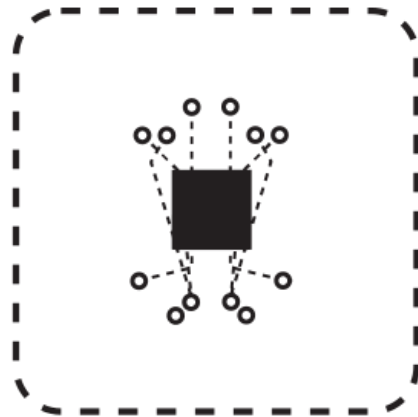
PRECISION
FORECASTING

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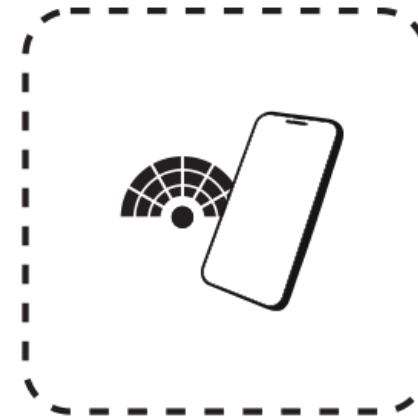
SENSORS

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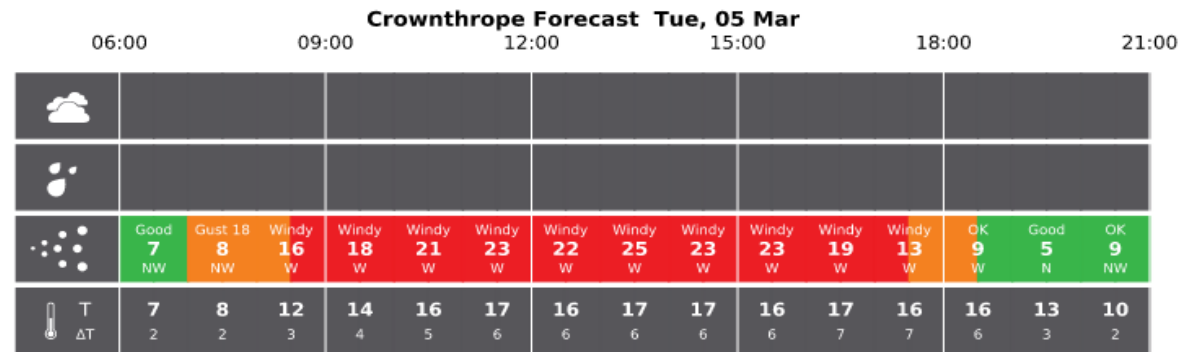
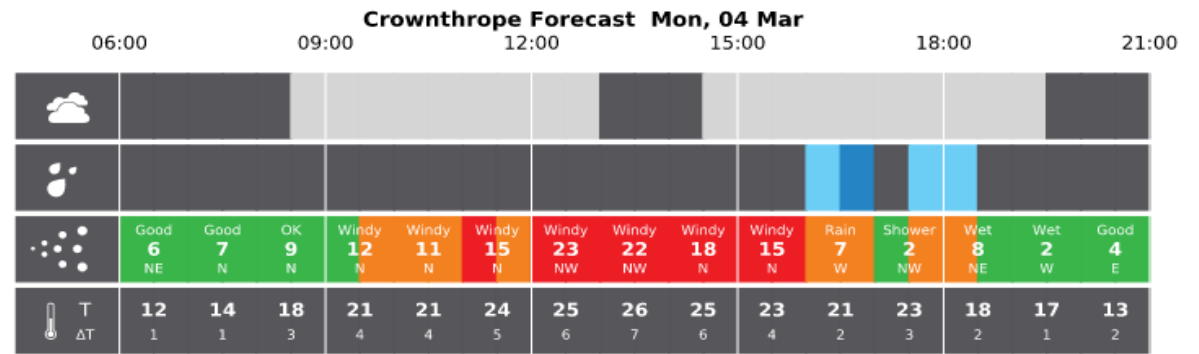
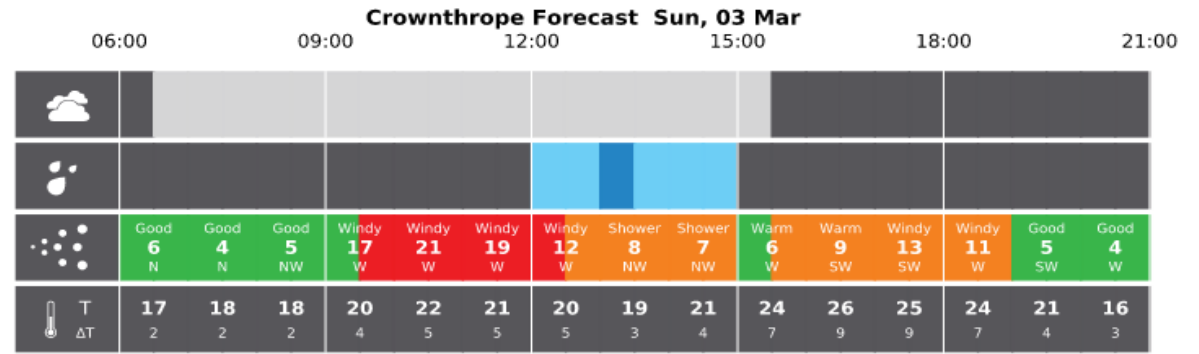
ARTIFICIAL
INTELLEGENCE

=



TAILORED ADVICE TO
INFORM YOUR OPERATIONS

FACTOR	POTENTIAL DRIFT HAZARD SCALE	
	HIGH	LOW
Wind speed	Zero/very low (<1 m/s) or >6 m/s	Steady (1-3 m/s)
Wind direction	Unpredictable	Predictable, and away from sensitive areas
Humidity	Low ($\Delta T > 8^{\circ}\text{C}$)	High ($\Delta T < 4^{\circ}\text{C}$)
Atmospheric stability	Inversion layer present	No inversion layer
Maximum height of release	>1.5 m above the target	<0.5 m above the target
Particle (droplet) size	<50 microns diameter	>250 microns diameter
Volatility	High (vapour pressure >10 mPa)	Low (vapour pressure <0.1 mPa)
Sensitive area	Close (<100 m away)	None, or more than 1 km distant
Buffer zone	None	Yes (>100 m)
Shelter belts	No shelter	Live shelter, >3 m high and 1 m thick
Toxicity	Scheduled agrichemicals	Unscheduled agrichemicals





Fort Knox for dust

PDP's Review of NZ's Regulation of Dust

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Toxic Town Ending: Spoiler Alert

- Dust disappears
- Loong court case
- Moral victory for the Good guys
- Good guys get heaps of cash
- Bad guys to go jail forever



Tox COU

Our Air C



Andrew C
Technical Dir



RE PARTNERS



mins
der

Dust is trending - CASANZ Dust Special Interest Group



our Seminars:

Dust?

of dust?

ception and