

# WIND-BLOWN DUST



Assessing and controlling dust emissions at industrial facilities

Dust is more than an annoyance; depending on its size and composition, dust can be a significant health and environmental hazard.

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Specifically, airborne dust particles (in particular those finer than 10 microns in diameter, called PM10) can penetrate deep into the lungs and impair respiratory processes. Dust that contains heavy metals or other toxic compounds can also cause a wide range of acute and chronic health effects. For these reasons, ambient dust levels are regulated in most jurisdictions around the world.

Dust is emitted as a result of both natural processes (wind erosion, wildfires) and human activities. Common sources of dust emissions at industrial facilities and mine sites include traffic on unpaved roads; drilling and blasting; and handling of raw materials or finished products (e.g., crushing, screening, stockpiling, loading/unloading).

Most dust issues can be managed effectively by adhering to site-specific dust control strategies and management plans.

## Our service

We quantify dust emissions from your operations and help you develop site-specific, pragmatic solutions to reduce dust emissions.

We have a unique set of skills crossing multiple disciplines and fields of expertise. Our core knowledge in the science of wind erosion is supported by expertise in meteorology, fluid dynamics, dispersion and deposition of airborne particles, the development of innovative mitigation strategies, computer simulations, and the implementation of real-time decision support systems.



This breadth of expertise, combined with our culture of innovation, means we are able to spot unexpected solutions or approaches that others might miss, particularly in unusual or complex situations. Although the science behind our analyses may be complex, we are committed to producing practical and cost-effective solutions that are easy to understand, implement, and maintain.

We typically start by visiting your site to determine baseline conditions and gain an in-depth understanding of day-to-day operations at your facility. Our analyses may range from source-specific measurements to full experimental testing. We then develop a list of priorities and recommendations, including mitigation where appropriate.

RWDI is a valuable partner to clients seeking to...

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### Explore Innovations

- Develop unique, cost-effective and customized solutions to minimize dust emissions from your specific site or operations
- Adapt operations in real-time based on forecasted weather and dispersion information

### Create Opportunities

- Find the most cost-effective operational changes to mitigate dust emissions

### Meet Challenges

- Monitor and mitigate hazardous material sources appropriately
- Balance costs with environmental protection

### Fulfill Expectations

- Meet or exceed compliance and regulatory requirements
- Address community concerns proactively

## How we work

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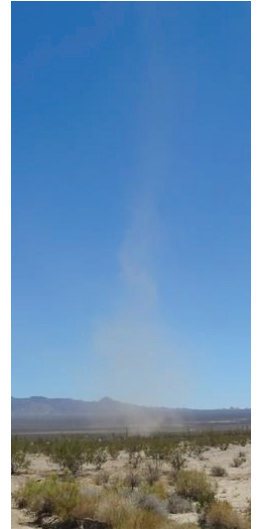
Our primary focus is the entrainment, transport, and deposition of particles by the wind. These processes are governed by a number of factors, including:

- Characteristics of the surface material
- Mechanical disturbance or handling of the material
- Meteorological conditions preceding and during the period of concern (wind speed, direction, precipitation).

When a senior consultant visits your site, he or she will tour the operation to evaluate sources and context.

- For sources, we note the location, dimensions and physical characteristics of dust emitting sources. These sources may include roads, material handling areas, raw material or product stockpiles, active mine surfaces, open areas and so on.
- For the context, we look for features that may affect wind flow patterns and therefore dust dispersion. These may be found in the local topography (terrain, vegetation, water bodies, etc.) or the built environment or structures.

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Depending on the specific needs and unique characteristics of your site, we may draw on any of the following resources:

- A full complement of active and passive air-sampling equipment and techniques—used to establish baseline conditions for ambient particulate matter across all pertinent size ranges (e.g., TSP or TPM, PM10, PM2.5, PM1)
- A portable wind tunnel—used on site to quantify dust emissions from such surfaces as material stockpiles or tailings
- Laboratory, boundary-layer wind tunnels—used to model complex wind-flow patterns over large facilities and to test mitigation strategies (e.g., enhanced pile management, berms, wind fences) at scale
- Meteorological data and modeling—used to anticipate risk of weather-related dust issues
- Real-time, source-specific measurement of ambient dust and weather—available to clients through a web-based interface.

The consultant often shares short-term solutions directly with site personnel in the field. Suggestions often include simple yet cost-effective changes to operating procedures, such as flattening piles, decreasing stacker drop heights, reducing traffic speeds or altering equipment placement or orientation. We collaborate with you to understand opportunities and constraints specific to your site and operations. Our goal is to develop specific, pragmatic and cost-effective solutions. And typically we favor passive options that require less maintenance or operating capital.

We caution that “magic bullet” solutions are rare. Instead, we consider and present multiple options, ranked in terms of a range of factors, such as mitigation efficiency, cost and requirements for passive versus active management. With these criteria, your technical staff and management can weigh the options according to your own needs and priorities.