RESPIRABLE AND SILICA DUST CONTROL

FUSING DUST MONITORING, MODELLING ENGINEERING CONTROLS AND VERIFICATION

PM10 Laboratories

PARTICULAR ENGINEERING

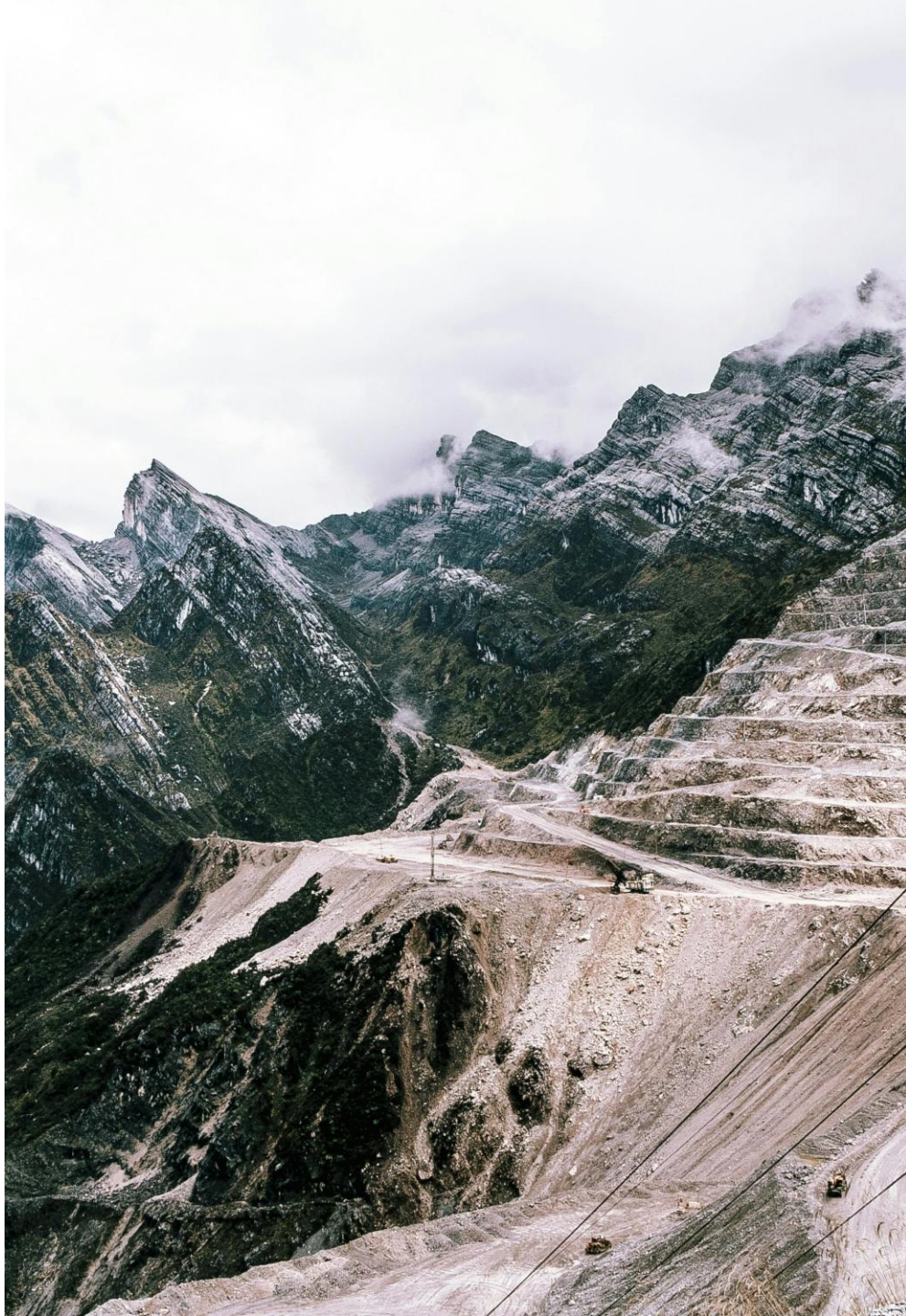
BEAUFORT PROFESSIONALS

INTRODUCTION

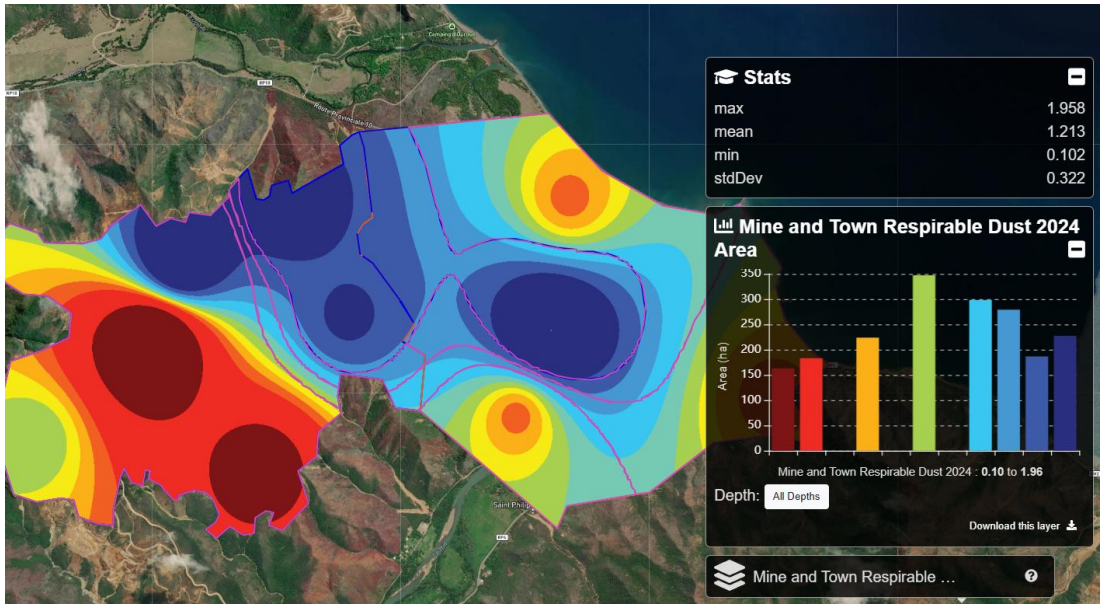
- Respirable and silica dust poses significant risks to workers health and the community.
- Effective monitoring is critical for safety, compliance, and efficiency.
- Modelling results to identify dust hotspots and assess the effectiveness of engineering controls.

CHALLENGES IN DEMONSTRATING THE EFFECTIVENESS OF A RESPIRABLE AND SILICA DUST SOLUTION

- Limited spatial resolution from traditional sampling methods.
- Difficulty identifying and managing dust hotspots in real-time.
- Lack of tools to evaluate the effectiveness of engineering controls.
- Need for precise, actionable, and adaptive solutions.



USING AN ENVIRONMENTAL MEASUREMENT PLATFORM



FarmLab Environmental Measurement Platform:

- Beaufort Professionals uses the FarmLab Environmental Measurement Platform to record all data and have a chain of custody from field measurement to analysis.

Modelling Physical Dust Samples to:

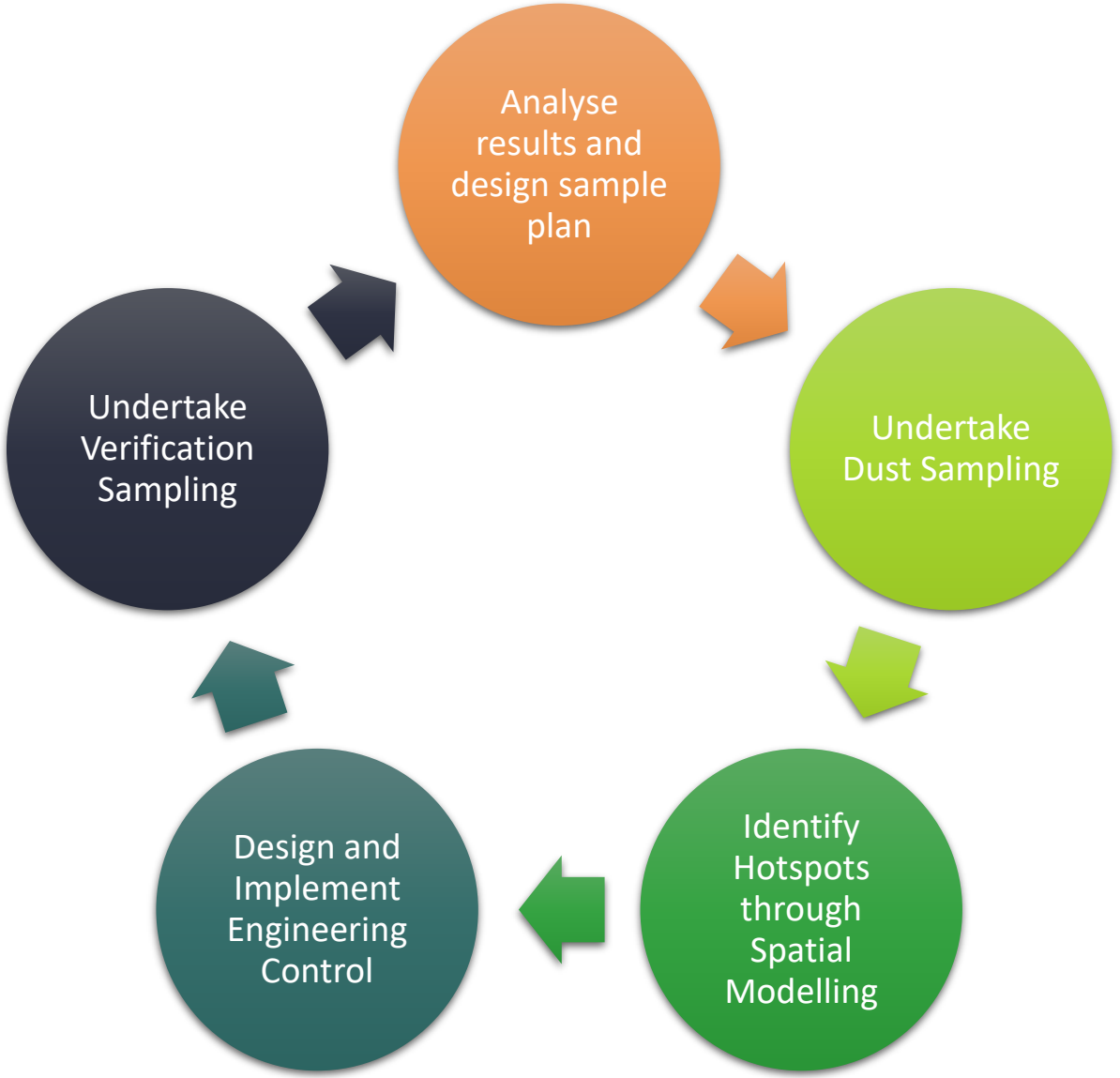
- Pinpoint dust concentration hotspots.
- Map spatial distribution with high resolution.

Outcome:

- Provides clear insights into dust hotspots,
- Enabling targeted application of engineering controls and real-time impact assessments.

HOW IT WORKS

1. **Data Collection - PM10 Laboratories**:
   - Sensors measure dust concentrations, wind data, and environmental parameters.
2. **Hotspot Identification – Beaufort Professionals**:
   - Interpolates sensor data to reveal high-concentration areas.
3. **Engineering Controls Implementation – Particular Engineering** :
   - Apply dust suppression techniques (e.g., water sprays, enclosures) to identified hotspots.
4. **Effectiveness Assessment – PM10 Laboratories**:
   - Post-control data compared against baseline hotspot maps to evaluate improvements.



WHY CHOOSE AN INTEGRATED METHOD?

- **Precision Targeting**: Rapidly identifies critical areas for intervention.
- **Actionable Insights**: Empowers decision-making with clear visualisations of dust hotspots.
- **Impact Assessment**: Quantifies the effectiveness of engineering controls in real-time.
- **Cost Efficiency**: Optimises resource use by focusing efforts where they are needed most.
- **Enhanced Worker/Community Safety**: Minimises exposure to harmful dust through targeted interventions.

MEASURING THE IMPACT OF OPEN CUT MINING ON COMMUNITIES

- **Scenario**: Monitoring fugitive and silica dust at a large open-pit mine and in surrounding township.

- **Steps**:

- Identify likely dust vectors and undertake monitoring.

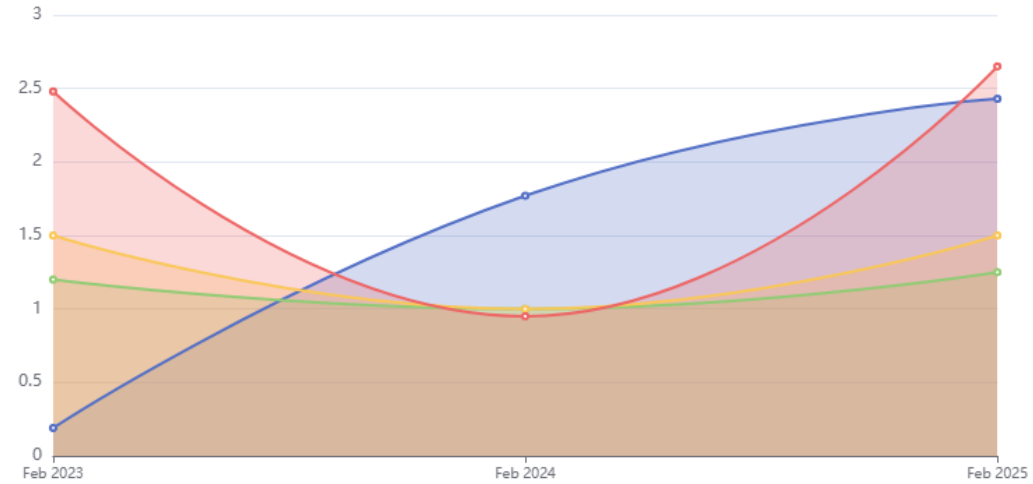
- Model Hotspots using collected data

- Apply dust suppression systems to targeted areas.

- Undertake post-intervention sampling and mapping to measure effectiveness.

- **Outcome**: Demonstrates the measurable impact of engineering controls and enables continuous improvement.

IMPACT OF OPEN CUT MINING ON COMMUNITIES



Sampling Results 23

Contaminant Testing Demo #5235 — Sample Results Table

Boundary		Mine Site	Township
Area	*ha*	893.11ha	1,015.15ha
Arsenic Mg-m3		0.13	0.05
Asbestos F-cc		0.09	0.03
Lead Mg-m3		0.03	0.03
Nickel Mg-m3		0.07	0.05
Respirable Coal Dust Mg-m3		1.95	2.04
Respirable Dust Mg-m3		1.88	1.44
Silica Mg-m3		0.03	0.04

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CONCLUSION

- Respirable and silica dust pose significant health risks and require effective management to mitigate their impact.
- An integrated solution covering monitoring, modelling, engineering control, and verification is the most effective way of minimising exposure, ensuring compliance, and safeguarding both workers and the community.

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THANK YOU