OIZOM
REDEFINING RESOURCES

Dust Suppression

Data-Driven Dust Control System

Concept

By monitoring particulate matter around mining, quarrying and construction sites, dust impact is quantified. Setting thresholds on the dust levels, relevant alerts can be generated for the authorities and regulatory bodies. The alerts are useful to optimize the dust suppression process and automate the system.

Target Parameters

UFPM (PM$_1$)

RSPM (PM$_{2.5}$)

SPM (PM$_{10}$)

TSP(PM$_{100}$)

Data Use-case

Dust impact monitoring on surrounding areas

Data-driven dust suppression

Data-driven dust filtration

For each 10 micrograms per cubic meter of air particles, city death rates increased by over 1%.
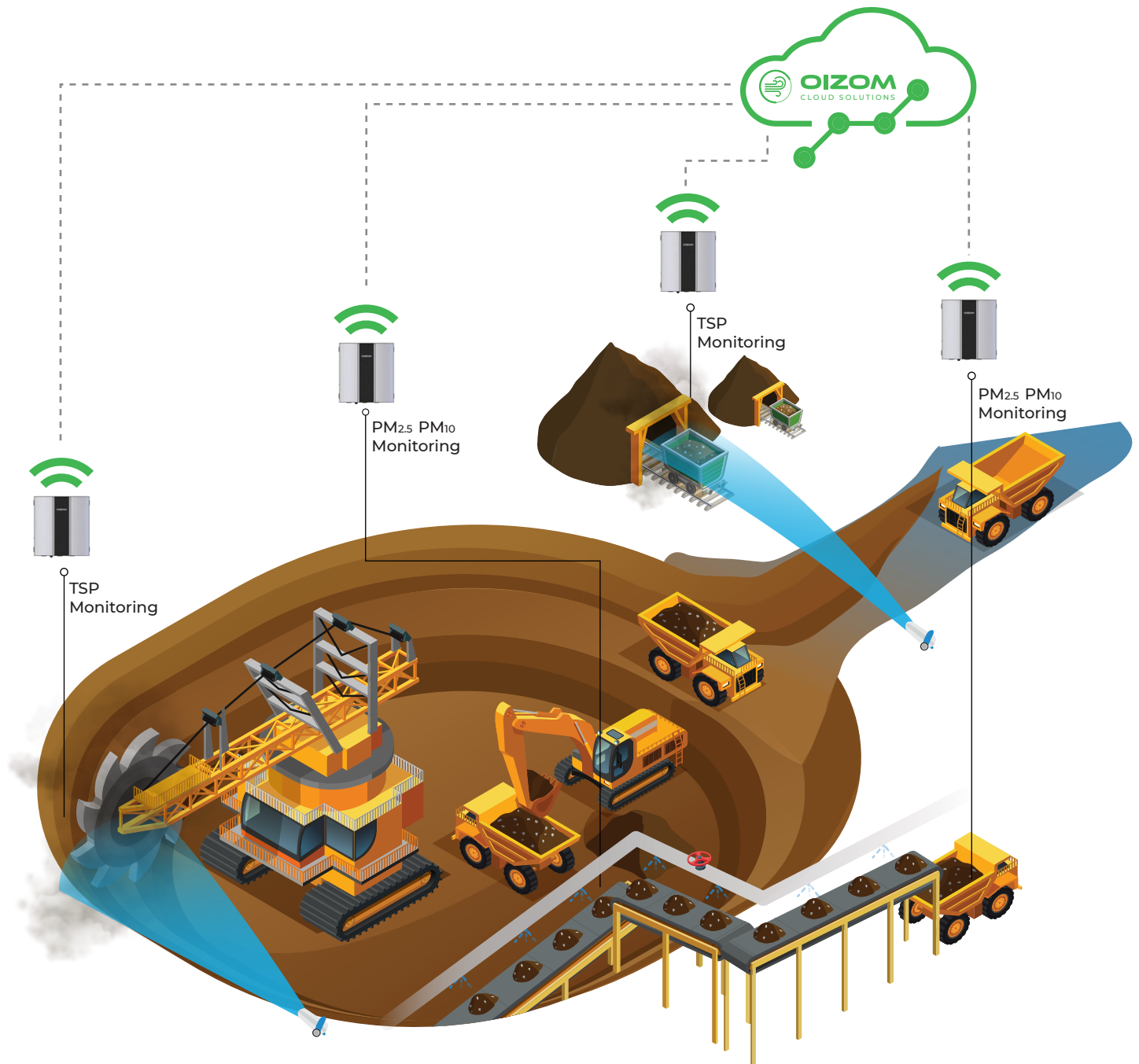
- Harvard University

Problem

Mining and quarrying activities contribute to dust emissions from periodic explosions and heavy transportation vehicles. Many industrial processes emit particulate matter mainly mineral, metallic and wooden dust. This phenomenon worsens air quality and increases the cases of respiratory ailments like asthma, bronchitis, etc.

Construction activities are also one of the major sources of airborne particles. It produces particles like metallic, gravel and concrete dust. In addition, DG sets and loading vehicles around the site emit gaseous pollutants like NO_2 and SO_2, which can form nitrate and sulphate particles. This attributes to the adverse effects on the health of the workers and residents living in the proximity.

Proposed Solution

- By installing Dustroid™ around mines, quarries and construction sites, monitoring of suspended particulate matter, i.e. PM_1, $PM_{2.5}$, PM_{10}, PM_{100} is done in real-time.
- The data helps in optimizing the dust suppression process in case of excessive emissions from the sources.
- This data is used to generate alerts and alarms based on the custom threshold set by regulators.
- Using such triggers, a pre-existing dust suppression system like Mist cannons, Sprinklers, Mechanical barriers, Dust collectors, Dust Filters, etc. is activated.

⚠️ **HIGH**
Dust Level
Initiate Dust
Suppression Unit

OFF ON

Intensity

OIZOM
CLOUD SOLUTIONS

TSP
Monitoring

$PM_{2.5}$ PM_{10}
Monitoring

$PM_{2.5}$ PM_{10}
Monitoring

TSP
Monitoring

TSP
Monitoring

Impact

The solution ensures that effective alerts are sent to the site contractor and the triggers automate the suppression systems on time. Taking relevant actions on these triggers, dust levels are maintained within the permissible limits for effective environmental regulation.

Case Studies

Industrial Dust Monitoring for JCB Manufacturing Plant, Pune

Heavy welding, metal cutting, and buffing activities inside the JCB manufacturing plant generate high amounts of $PM_{2.5}$ & PM_{10} (exceeding 300 ug/m^3). The situation demanded air quality monitoring and suppression of pollutants. Oizom deployed Dustroid™ to monitor real-time dust particle generation within the facility. The solution helped in setting up a threshold for the particulates and activate the air purification systems immediately.

📅 Jan 2019   ◎ 1 km²   ▦ Dustroid   🖥 Oizom Terminal

Air Quality Monitoring at GMR Thermal Power Plant, Warora, Maharashtra

Coal, fly ash, and secondary particles emitted from thermal power plants contribute to more than 30% of $PM_{2.5}$ generation in India. To meet the emission standards, the GMR Warora thermal plant needed to monitor and reduce the pollutants generated by stacking and moving of raw materials. Oizom Polludrone™ was installed to identify and monitor the ambient pollution level. The solution assisted in the automation of the air purifiers for suppressing the particulate pollution.

📅 Sep 2018   ◎ 2 km²   ▦ Polludrone   🖥 Oizom Terminal