



Case Study

Cogan Environmental Consulting

Overview

Zephyr® air quality monitors deployed at Cilyrychen Quarry in Wales to complete three-month dust monitoring survey and help progress planning permissions for major construction project.

The Challenge

Cilyrychen Quarry is a disused quarry located in Carmarthenshire, Wales. The quarry has been closed for over 20 years and in 2022, a company called Dolawen Cyf applied for planning permission to build a new recycling facility at Cilyrychen Quarry.

As part of the permissions required from Carmarthenshire County Council, the local authority asserted one particular condition that stated: 'Prior to the commencement of development on the site. further baseline monitoring for air quality shall be carried out for a period of three months'. This was to protect the health of local residents.

Automatic monitoring to confirm baseline conditions was recommended as the Institute of Air Quality Management (IAQM) Mineral Dust Guidance states that when baseline dust concentrations are below 17 µg/m³, exceedances of the PM10 air quality objectives are protected and significant effects are unlikely.

The Solution

To help it to discharge this condition, Dolawen Cyf commissioned Cogan Environmental Consulting to undertake a dust monitoring survey at the quarry site. Cogan Environmental Consulting is an independent environmental consultancy providing customer focused expert air quality, dust, odour, and climate support.

A dust (PM10) monitoring survey was set up to capture a three-month period of baseline conditions. The monitoring strategy for the survey was devised and agreed with Carmarthenshire County Council, which requested that meteorological conditions should also be monitored.

Cogan Environmental Consulting used an MCERTS Zephyr® sensor from air quality monitoring specialist EarthSense, for the survey. The monitor was used to provide a continuous assessment of dust levels over the three-month period. A site was agreed that would most accurately represent surrounding properties, given topography of the land and safety of the monitoring equipment over the monitoring period. One of the key difficulties monitoring within a quarry is the lack of mains power; to overcome this the Zephyr® was powered by a solar panel supplied by EarthSense.

A meteorological station (DAVIS Vantage Pro2 GroWeather) was also installed by Cogan Environmental Consulting to report weather

conditions in the local vicinity. Solar power was also used for this monitor.



Outcomes

The EarthSense Zephyr® took measurements of PM10 concentrations every 10 seconds during normal mode and every one minute when in low power mode. The measurements were uploaded to a cloud-based system.

The Cogan Environmental Consulting meteorological station recorded measurements of wind speed, wind direction, rain, solar radiation, temperature and humidity every minute and uploaded to a cloud-based system.

The measurement data were downloaded from the cloud-based systems and analysed by Cogan Environmental Consulting. The measurements from the three-month period demonstrated that the average PM10 concentration level (i.e. baseline PM10 concentration) is 8.24 $\mu\text{g}/\text{m}^3$, well below the screening criterion of 17 $\mu\text{g}/\text{m}^3$.



Quotes

Dr Austin Cogan, Director & Practice Manager at Cogan Environmental Consulting, says: "This project provided a fantastic opportunity for Cogan Environmental Consulting to collaborate with EarthSense, a spin-out company from the University of Leicester.

As a former University of Leicester colleague of EarthSense's Chief Technical Director, Roland Leigh, it was great to see how much the company has evolved since early prototyping of Zephyr® in 2013."

Get in Touch

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