Explain your report

At the start of your report you must:

- explain the purpose of the study **– assess the impact of changing the height of stack A58**
- describe the site **– integrated steelworks – the stack of interest is the West Secondary Vent stack, which is a backup in case of unavailability of the main secondary ventilation system at the BOS Plant**
- explain the modelled scenarios and how they represent your operations **– three scenarios are included – the original stack height (45.7 metres), current stack height following safety works (27 metres) and the proposed rebuilt stack height (36 metres)**

List emissions and environmental standards for air

- **Emissions of particulate matter**
- **Standards: annual mean PM_{10} < 40 µg/m³; 90th percentile of daily mean PM_{10} < 50 µg/m³; annual mean $PM_{2.5}$ < 25 µg/m³**

Work out ambient and background levels

You must:

work out a representative value for the background concentration

explain how your background concentrations are representative of the local environment

- **See Table 2 "Results of local air quality monitoring, 2019" in report already submitted**

Explain the model

You must list the:

- dispersion modelling software used **– ADMS**
- software name, including version number **– model version 5.2.1.0**
- type of model, for example Gaussian or new-generation **– new generation Gaussian**
- supplier **– CERC**

Explain emission parameters

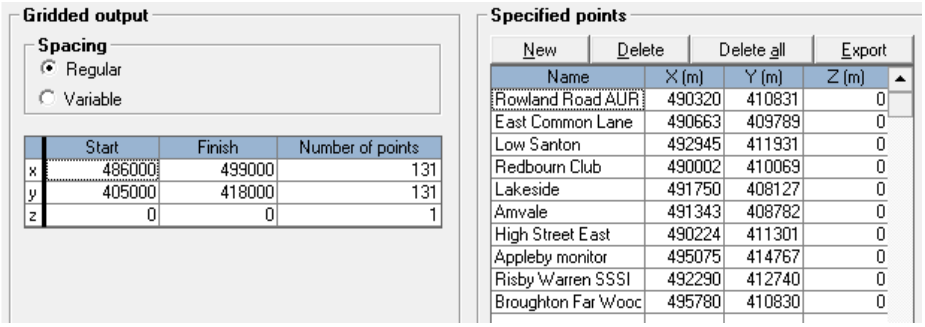
You must provide and explain the following information, including relevant units, in a table.

Parameter	Value	Units
Stack location	492923 408642	(grid reference)
Stack height	27, 36 and 45.7	(metres)
Pollutant emission rate	1.9	(grammes per second)
Exit diameter	2.58	(metres)
Exit temperature	28	°C
Volumetric flow rate	38.7	Nm³/s

You must explain how you have worked out the emission rates used in your model.

- **Emission rate calculated assuming emissions continuously at the ELV (50 mg/Nm³)**

Explain the modelled domain and receptors

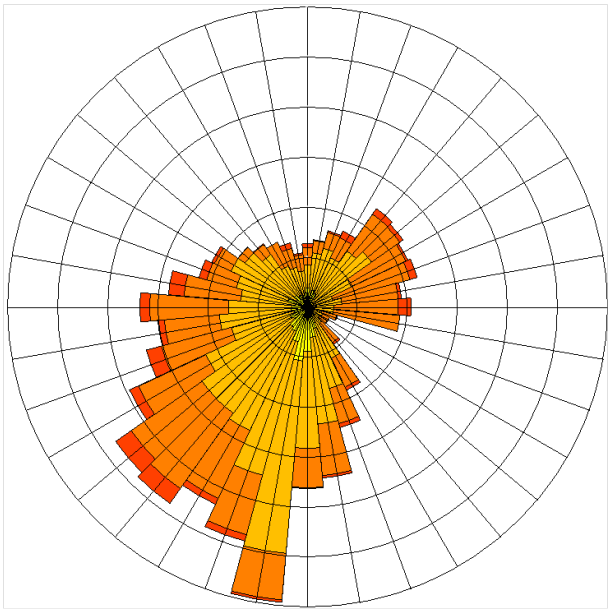


Explain meteorological data and surface characteristics

Wind direction and wind speed are routinely measured at the Rowland Road monitoring site in Scunthorpe, operated by North Lincolnshire Council, but there is no cloud cover data or any other data suitable for the assessment of atmospheric stability. The nearest site where cloud cover data are recorded is Humberside Airport, 17 km east of the steelworks. The meteorological data used for this modelling was an amalgam of wind direction and speed from Rowland Road and cloud cover, ambient temperature, rainfall and relative humidity from Humberside Airport.

The data is hourly sequential for the period 2012 to 2014.

A wind rose showing the distribution of wind speed and direction:



Wind Speed

0 3 6 10 16 (knots)

0 1.5 3.1 5.1 8.2 (m/s)

Explain terrain and building treatments

Buildings were included in the modelling study as the stack under consideration is close to the BOS Plant. Complex terrain was not included as the area in the vicinity of Scunthorpe is generally flat.

Show the location and dimensions of all buildings included in the model, including National Grid reference, height, width and rotation

Main	Name	Shape	X (m)	Y (m)	Height (m)	Length / Diameter (m)	Width (m)	Angle (°)
✓	BOS Plant	Rectangular	493020	408740	71.4	335	105	98

Special treatments

No special treatments (other than the inclusion of buildings) have been used in this modelling study.