Environmental Permit Application – Manchester Airport

Document no: 1
Revision no:1

Manchester Airport plc

MAN Combustion Permit
20 June 2025

Environmental Permit Application – Manchester Airport

Client name:	Manchester Airport plc		
Project name:	MAN Combustion Permit		
Client reference:		**Project no:**	MAG42059
Document no:	1	**Project manager:**	Katherine Eleanor Seddon
Revision no:	1	**Prepared by:**	David Howells
Date:	20 June 2025	**File name:**	MAG_Air Quality Impact Assessment v1.0_FINAL

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
0	27/05/2025	Draft for client review	D Howells	D Moroniak-Wawryszuk	G Wilson	K E Seddon
1	20/06/2025	Final for submission	D Howells	D Moroniak-Wawryszuk	G Wilson	K E Seddon

Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments

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Executive Summary

Manchester Airport plc, which is owned by Manchester Airport Group plc (hereafter 'MAG'), requires an Environmental Permit (EP) under the Industrial Emissions Directive (IED) (European Union, 2010), to operate on-site Medium Combustion Plant (MCP) at Manchester Airport (M90 1QX) (hereafter 'the site'). The MCP includes natural gas fired boilers and diesel fuelled standby generators, which provide heat and/or power across the site including the airport terminals, fire stations and associated training areas, sprinkler and hydrant systems and railway station.

Jacobs UK Limited (hereafter 'Jacobs') has carried out an Air Quality Impact Assessment (AQIA) on behalf of MAG to assess the potential impact of emissions from the existing boilers and standby generators.

The AQIA considers the impacts set out below.

- The potential impact on human health due to emissions of pollutants. The pollutants considered include nitrogen dioxide (NO_2); carbon monoxide (CO); sulphur dioxide (SO_2) and particulate matter (PM_{10}, particles with an aerodynamic diameter of 10 microns or less and $PM_{2.5}$, particles with an aerodynamic diameter of 2.5 microns or less).
- The potential impact on vegetation and ecosystems due to emissions of oxides of nitrogen (NOx) and SO_2.

Human receptors

Off-site sensitive human receptor locations

The results indicate that for annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations, the respective process contributions (PCs) are either less than 1% of the relevant long-term Environmental Quality Standard (EQS) or where the PCs are above 1% of the relevant EQS, the predicted environmental concentration (PEC) is less than 70% of the relevant EQS and the impacts are considered 'not significant' as per Environment Agency guidance (Environment Agency, 2025).

For short-term NO_2, CO, SO_2 and particulate concentrations, the PCs are either less than 10% of the relevant EQS or where the PCs are above 10% of the relevant EQS, the respective PEC is less than 70% of the relevant EQS and the impacts are considered 'not significant'.

On-site sensitive human receptor locations

For short-term CO and SO_2 concentrations, although there is no requirement to compare to the relevant EQS as the assessed on-site human receptor locations do not meet the relevant public exposure definition as per Defra's Local Air Quality Management (LAQM) Technical Guidance (TG22) (Defra, 2022), the PCs are less than 10% of the relevant EQS and the impacts are considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

For 1-hour mean NO_2 (99.79th percentile) concentrations, the PC is considerably elevated and the corresponding PEC exceeds the relevant standard. The highest PC is predicted to occur at R52, which represents a parking space on the upper floor of the T2 West multi-storey car park, adjacent to the A24 boiler stacks. As this receptor represents a parking space, it is reasonable to assume that a member of the public would not be exposed for an hour or more at this location.

Off-site modelled locations

For short-term CO and SO_2 concentrations, the PCs are equal to or less than 10% of the relevant EQS and the impacts are considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

For 1-hour mean NO_2 (99.79th percentile) concentrations, the PC is high and the corresponding PEC exceeds the relevant standard. The highest PC is predicted to occur at the southern fenceline of the site approximately 40 m east-southeast of GEN24. Although just beyond the site fence line, this location is not accessible to members of the public. Further analysis indicates that none of the off-site locations where an exceedance of the short-term NO_2 EQS is predicted (i.e. adjacent to GEN04 / GEN05, GEN 15, GEN21 / GEN 22, GEN24 / GEN 25), are accessible to members of the public.

For those locations that are accessible to members of the public, the highest concentration is predicted to occur on Woodend Lane adjacent to the southern boundary of the site. As there are no footpaths along this lane, it is reasonable to assume that a member of the public would not be exposed for an hour or more at this location

Greater Manchester Combined Authority Air Quality Management Area (AQMA)

The results indicate that for annual mean NO_2 and 24-hour mean (90.41st percentile) PM_{10} concentrations, the respective PCs are less than 16% of the relevant EQS. The highest PCs are predicted to occur in hedgerow between GEN15 and the M56 motorway in an area not accessible to members of the public. It should be noted there are no residential properties in the vicinity of this location. For those locations that are accessible to members of the public, the highest concentrations are predicted to occur on footpaths along Outwood Lane.

Based on the findings of the assessment and when considering the conservative approach adopted throughout, the overall impact is considered 'not significant' for sensitive off-site human receptor locations.

Protected conservation areas

For critical levels and critical loads, the results indicate that at the assessed European designated sites and assessed local nature sites, the PCs are less than 1% and 100%, respectively, of the relevant critical level / load and the effect is considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

At Cotteril Clough Site of Special Scientific Interest (SSSI), the annual mean NOx PC is above 1% (i.e. 3.6%) of the relevant critical level value and the corresponding PEC exceeds this critical level value. For critical loads, the PC for nutrient nitrogen deposition is just above 1% (i.e. 1.5%) of the relevant critical load value. Further analysis of Cotteril Clough SSSI indicates that the main habitat type at Unit 001 and 002 has been declared 'Favourable', even with the historical operation of the assessed combustion plant at Manchester Airport.

The conservative approach adopted throughout this assessment means the results presented are likely to be higher than would reasonably be expected. Therefore, the impact at Cotteril Clough SSSI is considered 'not significant'.

For the maximum 24-hour mean critical level for NOx, the results indicate that at Manchester Mosses Special Area of Conservation (SAC), the PC is less than 10% of the relevant critical level and the effect is considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025). At Rixton Clay Pits SAC Rostherne Mere Ramsar and Midland Mere & Mosses - Phase 1 Ramsar, the PCs are above 10% of the relevant critical level (i.e. 10.1%, 15% and 10.2%, respectively). However, the corresponding PEC equates to less than 61% of the EQS and the impact is considered 'not significant'.

At Cotteril Clough SSSI, the 24-hour mean NOx PC is elevated and equates to 74.3% of the EQS and the corresponding PEC is predicted to exceed the critical level value.

Further analysis indicates that GEN04, which is approximately 0.62 km south-southwest of this location, contributes approximately 91% of the predicted PC. GEN04 primarily operates during routine testing / essential maintenance works and typically operates for less than 200 hours per year (reducing to approximately 12 hours per year from May 2025 onwards). It is extremely unlikely that it would operate for a prolonged period up to 24 hours and would coincide with all of the worst meteorological conditions each year.

At Ponds near Manchester Airport Runway local wildlife site (LWS), Wood End - Lady Lane LWS and Oversley Ford Brickworks And Road Embankment LWS, the respective daily mean NOx PCs exceed 900 µg/m^3. The PCs predicted at these protected conservation areas are dominated by emissions from GEN04, GEN21 and GEN24, respectively. These standby generators operate primarily during routine testing / essential maintenance works and typically operate for less than 200 hours per year (reducing to approximately 12 hours per year from May 2025 onwards). It is extremely unlikely that they would operate for a prolonged period up to 24 hours and would coincide with all of the worst meteorological conditions each year.

The conservative assumptions adopted throughout this assessment means the results presented are likely to be considerably higher than would reasonably be expected and based on professional judgement, the impact is considered to be 'not significant'.

Summary

Based on the above assessment, it is concluded that the operation of the assessed combustion plant at Manchester Airport are acceptable from an air quality perspective.

Contents

Appendices

1. Introduction

1.1 Background

Manchester Airport plc, which is owned by Manchester Airports Group plc (hereafter 'MAG'), requires an Environmental Permit (EP) under the Industrial Emissions Directive (IED)[1,2] (European Union, 2010), to operate the on-site Medium Combustion Plant (MCP) at Manchester Airport (M90 1QX) (hereafter 'the site'). The MCP includes existing natural gas fired boilers and diesel fuelled standby generators, which provide heat and/or power across the site including the airport terminals, fire stations and associated training areas, sprinkler and hydrant systems and railway station.

Jacobs UK Limited (hereafter 'Jacobs') has carried out an Air Quality Impact Assessment (AQIA) on behalf of MAG to assess the potential impact of emissions from the existing boilers and standby generators.

1.2 Study Outline

This AQIA is required to support the EP application and assesses the likely significant air quality effects of emissions to air from the existing boilers and standby generators at the site. The air quality assessment has been carried out following the relevant Environment Agency guidance (Environment Agency; 2024, 2025). The AQIA considers the impacts set out below.

- The potential impact on human health due to emissions of pollutants. The pollutants considered include nitrogen dioxide (NO_2); carbon monoxide (CO); sulphur dioxide (SO_2) and particulate matter (PM_{10}, particles with an aerodynamic diameter of 10 microns or less and $PM_{2.5}$, particles with an aerodynamic diameter of 2.5 microns or less).
- The potential impact on vegetation and ecosystems due to emissions of oxides of nitrogen (NOx) and SO_2.

For the purpose of this assessment, the site boundary is denoted by the approximate site fenceline, as presented in Figure 1. In practice, the MAG ownership boundary extends beyond the fenceline and encompasses areas including the A538 (Wilmslow Road) and A555 (Manchester Airport Relief Road).

This report draws upon information provided from the following parties:

- MAG;
- ADM Ltd (meteorological data supplier);
- Centre for Ecology and Hydrology (CEH);
- Department for Environment, Food and Rural Affairs (Defra);
- Manchester City Council; and
- Greater Manchester Combined Authority (GMCA)[3].

This report includes a description of the emission sources, description of methodology and significance criteria, a review of the baseline conditions including an exploration of the existing environment of the site and surrounding area, an evaluation of results and the potential impact of emissions on human health and protected conservation areas (also referred to in this report as 'ecological receptors') during operation and, finally, conclusions of the assessment.

1 European Directive 2010/75/EU.

2 Transposed into UK law through the Environmental Permitting (England and Wales) Regulations 2016 (UK Government, 2016).

3 Made up of the ten Greater Manchester councils and Mayor, who work with other local services, businesses, communities and other partners to improve the city-region.

2. Emission Sources

2.1 Emission Sources to Air

When considering the on-site boilers to be included in the assessment it is important to note that the Medium Combustion Plant Directive (MCPD) EU/2015/2193 (European Union, 2015)[4] regulations only apply to MCP with a rated thermal input equal to or greater than 1 MWth and less than 50 MWth, regardless of the type of fuel used or the number of hours of operation. Therefore, any MCP less than 1 MWth do not fall under the MCPD regulations, nor is there a requirement to include them in the EP.

However, based on their typical operational hours (see Table 2-1), as a worst-case approach to the assessment all relevant boilers irrespective of thermal input capacity, have been included in the assessment.

The relevant on-site standby generators, which operate primarily during routine testing and maintenance, typically operate for less than 250 hours per year. As the operation of any standby generators less than 1 MWth is likely to have a negligible impact on air quality, this assessment only considers standby generators with a thermal input capacity equal to or greater than 1 MWth.

The emission sources to air being considered in this assessment and presented in Table 2-1 and Figure 1.

The modelling only considers emissions from these existing sources and no other emission points to air at the site have been included in the assessment.

Table 2-1: Combustion plant considered in this assessment

Emission point ref	Location / description	Thermal input capacity (MWth)	Typical annual operational hours
Assessed boilers			
A20	Fire training rig	7.728	12
A07	T2 Boiler House	7.143	4,200
A07	T2 Boiler House	7.143	4,200
A01	T1 Boiler House	4.643	4,200
A01	T1 Boiler House	4.643	4,200
A03	T3 Boiler House	2.857	4,200
A03	T3 Boiler House	2.857	4,200
A03	T3 Boiler House	2.857	4,200
A08	Cargo Centre Main Boiler House	2.857	4,200
A08	Cargo Centre Main Boiler House	2.857	4,200
A24	MAN- TP Energy Centre	2.144	4,200
A24	MAN- TP Energy Centre	2.144	4,200
A24	MAN- TP Energy Centre	2.144	4,200
A14	Aviation Viewing Park	0.824	4,200
A13	Voyager	0.714	8,400
A13	Voyager	0.714	8,400
A02	T1 Arrivals	0.673	4,200
A02	T1 Arrivals	0.673	4,200
A02	T1 Arrivals	0.673	4,200
A18[1]	Terminal 1 Stand 21 F&B	0.603	8,400
A05	Olympic House Plantroom	0.577	4,200
A05	Olympic House Plantroom	0.577	4,200
A24	MAN-TP Energy Centre	0.558	8,400
A18[1]	Terminal 1 Stand 21 F&B	0.177	8,400
A18[1]	Terminal 1 Stand 21 F&B	0.177	8,400
A18[1]	Terminal 1 Stand 21 F&B	0.177	8,400

4 Transposed into UK Law through the Environmental Permitting (England and Wales) (Amendment) Regulations 2018 (UK Government, 2018).

Emission point ref	Location / description	Thermal input capacity (MWth)	Typical annual operational hours
A11[2]	Rail Station	0.175	4,200
A11[2]	Rail Station	0.175	4,200
A11[2]	Rail Station	0.175	4,200
A18[1]	Terminal 1 Stand 21 F&B	0.089	8,400
A09	West Side Fire Station	0.191	8,400
A09	West Side Fire Station	0.191	8,400
A17	T1 OBC	0.183	8,400
A17	T1 OBC	0.183	8,400
Assessed standby generators			
GEN02	ATC Tower	1.33	39
GEN04	BSUB ENG 1	1.33	193[3]
GEN05	BSUB ENG 2	1.33	164[3]
GEN06	CSUB ENG 1	1.33	159[3]
GEN07	CSUB ENG 2	1.33	180[3]
GEN08	CSUB R2/C	1.21	<250
GEN09	D SUB	1.33	<10
GEN11	G SUB	1.52	12
GEN14	PHASE 4 SUB	1.48	<10
GEN15	Pump Station B7	1.05	25
GEN17	RSUB ENG 1	1.64	12
GEN18	RSUB ENG 2	1.33	12
GEN19	Southern Front	1.21	12
GEN21	R2/1 SUB ENG 1	2.42	126[3]
GEN22	R2/1 SUB ENG 2	2.42	128[3]
GEN24	R2/3 SUB ENG 1	2.42	140[3]
GEN25	R2/3 SUB ENG 2	2.42	120[3]
GEN28	T2 B1 SUB	1.06	72
GEN29	T2 G2A SUB	4.00	12
GEN30	T3 H1 SUB	1.64	12
GEN31	Voyager 7th Floor	1.83	12
GEN32	West Apron Ph6A	1.33	14

Note 1: Waste gases exit into the atmosphere via shared stack.

Note 2: Waste gases exit into the atmosphere via shared stack.

Note 3: Anticipated to be 12 hours per year from May 2025 onwards.

For long-term (i.e. annual mean) predicted modelled concentrations, this assessment has been carried out on the assumption that the considered boilers operate as per the hours presented in Table 2-1. As the standby generators operate intermittently (depending on demand or testing requirement), as a conservative approach to the assessment, it is assumed all considered standby generators operate for 250 hours per year.

From May 2025, some of the assessed standby generators will typically operate for 12 hours per year. It should be noted air dispersion modelling was carried out in March 2025 and so does not reflect this reduction in operational hours.

For short-term modelled concentrations, it is assumed the assessed boilers and standby generators operate continuously (i.e. 8,760 hours per year) as this approach ensures that the worst-case or maximum short-term modelled concentrations are quantified (further consideration of this is provided in Appendix A). This is considered an overly conservative approach for 8-hour and 24-hour mean averaging periods (see Table 3-1 and Table 3-2) as the standby generators in particular are extremely unlikely to operate for a continued period up to 24 hours during the year.

Due to the importance of maintaining power to essential services at the airport, some of the assessed standby generators presented in Table 2-1 act in a backup capacity to neighbouring standby generators and will not operate simultaneously. Therefore, GEN05 (which is paired with GEN04), GEN07 (which is paired with

GEN06), GEN22 (which is paired with GEN21) and GEN25 (which is paired with GEN24) are not included in the assessment for short-term modelled concentrations.

2.2 Emissions Data

2.2.1 Emission Concentration of Pollutants

For the assessed boilers (excluding emission points A24), the NOx emission concentration was obtained from the MCPD (European Union, 2015) for existing MCP other than engines and gas turbines. As the A24 boilers, were commissioned in 2019, the NOx emission concentration was obtained from the MCPD (European Union, 2015) for new MCP other than engines and gas turbines. For CO, in absence of emissions data, the emission concentration was obtained from the value for natural gas from Defra's Process Guidance Note 1/3,'*Statutory Guidance for Boilers and Furnaces 20-50MW thermal input*' (Defra, 2012).

As per the MCPD (European Union, 2015), there are no emission requirements for standby generators. Therefore (and in the absence of emissions data), a NOx emission concentration of 750 mg/Nm^{3,5} has been applied. This is derived from the Environment Agency's '*Emergency backup diesel engines on installations: best available techniques (BAT)*' guidance level (Environment Agency, 2023), which is not an emission limit value compliance requirement. In practice, based on the thermal input capacity of the standby generators (see Table 2-1), the NOx emission concentrations are likely to be considerably lower.

In the absence of emissions data, the CO, particulates and SO_2 emission concentrations used in the model are based on professional judgement acquired from previous work involving diesel fuelled standby generators of a similar size, which is considered an appropriate approach to the assessment.

2.2.2 Other Emission Parameters

For the assessed boilers and standby generators, the exhaust gas volumetric flows were determined using stoichiometric calculations based on the combustion of relevant fuel at the maximum thermal input rating of the assessed combustion plant.

For boiler emission sources; A01, A24, A02, A18, A11, A09 and A17, the exhaust gas temperature and oxygen content were obtained from on-site monitoring of the emission sources (MAG; 2024, 2025). The moisture content is based on professional judgement acquired from previous work involving natural gas fuelled boilers of a similar size. For the remaining assessed boilers, the exhaust gas temperature is based on the average monitored exhaust gas temperature for those boilers described above. The moisture and oxygen content are based on professional judgement acquired from previous work involving natural gas fuelled boilers of a similar size.

For the standby generators, the exhaust gas temperature, oxygen and moisture content are based on professional judgement acquired from previous work involving diesel fuelled standby generators of a similar thermal input capacity. This is considered an appropriate approach to the assessment.

The emissions inventory of releases to air from the assessed boilers and standby generators are provided in Appendix A.

5 Normalised flows and concentrations presented at 273 K, 101.3 kPa, dry gas and oxygen content of 15%.

3. Assessment Methodology

This section presents a summary of the methodology used for the assessment of the potential impacts of the site. A full description of the study inputs and assumptions are provided in Appendix A.

3.1 Assessment Location

For this assessment, 47 of the closest off-site sensitive human receptors near the site boundary were identified for modelling purposes. These receptors, which surround the site, represent residential properties and hotels.

For information purposes, this assessment also includes 9 on-site human receptors, which represent hotels and car parks.

The human receptor locations considered in this assessment are presented in Figure 2.

Furthermore, the Greater Manchester Combined Authority Air Quality Management Area (AQMA) (see Section 4.2), which encroaches parts of the site, was also included in the assessment.

In line with the Environment Agency guidance '*Air emissions risk assessment for your environmental permit*' (Environment Agency, 2025), it is necessary to identify protected conservation areas within the following distances from the site:

- European sites (i.e. Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar sites) within 15 km; and
- Site of Special Scientific Interest (SSSI) and local nature sites (i.e. ancient woodlands, local wildlife sites[6] (LWS), national and local nature reserves (NNR and LNR) within 2 km.

Based on these criteria; Rixton Clay Pits SAC, Manchester Mosses SAC, Rostherne Mere Ramsar, Midland Mere & Mosses – Phase 1 Ramsar, Cotterill Clough SSSI (& AW, LWS) and 48 local nature sites were included in the assessment. The boundary of some of these protected conservation areas encroach the site, and in some instances, the standby generator housing envelope. An example of this is Wood End - Lady Lane LWS, which encroaches the generator housing envelope for GEN21 and GEN22. Therefore, modelled grid points[7] (at ground level) to represent those protected conservation areas closest to the site, have been applied in the model to quantify the maximum process contributions (PCs).

The location of the assessed protected conservation areas are presented in Figure 3 and further details are set out in Appendix A.

3.2 Overall Methodology

The assessment was carried out using an atmospheric dispersion modelling technique. Cambridge Environmental Research Consultants (CERC) Atmospheric Dispersion Modelling System (ADMS) version 6.0.2 was used to model releases of the identified substances. The ADMS model predicts the dispersion of operational emissions from a specific source (e.g. a stack), and the subsequent concentrations over an identified area (e.g. at ground level across a grid of receptor points) or at specified points (e.g. a residential property). ADMS was selected because this model is fit for the purpose of modelling the emissions from the type of sources on-site (i.e. point source emissions from a combustion source) and is accepted as a suitable assessment tool by the Environment Agency.

The modelling assessment was undertaken in accordance with the Environment Agency guidance '*Air emissions risk assessment for your environmental permit*' (Environment Agency, 2025).

A summary of the dispersion modelling procedure is set out below.

1. Information on plant location and stack parameters were supplied by MAG (MAG; 2024, 2025) and obtained during a site visit (Jacobs, 2024). Information on the boilers and generators were obtained from various sources as described in Section 2.2.
2. Five years of hourly sequential data recorded at Manchester Airport (2019 – 2023 inclusive) were used for the assessment (ADM Ltd, 2024).

6 Including sites of biological importance, which are non-statutory designations used locally by the Greater Manchester, Cheshire and Staffordshire County Councils.

7 Those grid points that are located on areas of hardstanding / within a building envelope, have been removed from consideration.

3. Information on the main buildings located on-site, that could influence dispersion of emissions from the boilers and generator stacks were estimated from Defra's environmental open-data applications and datasets (Defra, 2025a), on-site photography and Google Earth (Google Earth, 2025).
4. The maximum predicted concentrations (at a modelled height of 1.5 m or 'breathing zone') at the assessed sensitive human receptor locations R1 – R47 (representing long-term exposure at residential properties and off-site hotels) were considered for the assessment of annual mean, 24-hour mean, 8-hour mean, 1-hour mean and 15-minute mean pollutant concentrations within the study area. For receptors R48 - R56 (representing on-site hotels and car parks), only the 1-hour mean and 15-minute mean concentrations were considered. To note, on-site human receptors have been included in the assessment to provide a general understanding of pollutant dispersion across the site and not for the purpose of comparison with the relevant Environmental Quality Standard (EQS) (see Section 3.3). The maximum predicted concentrations at an off-site location in the vicinity of the site were considered for the assessment of short-term (1-hour and 15-minute mean) concentrations. The nearby AQMA (see Section 4.2) was considered for annual mean NO_2 and 24-hour mean PM_{10} concentrations only.
5. The above information was entered into the dispersion model.
6. The dispersion model was run to provide the Process Contribution (PC). The PC is the estimated maximum environmental concentration of substances due to releases from the process alone. The results were then combined with baseline concentrations (see Section 4.2) to provide the Predicted Environmental Concentration (PEC) of the substances of interest.
7. The PECs were then assessed against the appropriate environmental standards for air emissions for each substance set out in the Environment Agency's guidance (Environment Agency, 2025) document to determine the nature and extent of any potential adverse effects.
8. Modelled concentrations were processed using geographic information system (GIS) software (ArcGIS Pro 3.1.2) to produce contour plots of the model results. These are provided for illustrative purposes only; assessment of the model results was based on the numerical values outputted by the dispersion model on the model grid and at the specific receptor locations and were processed using Microsoft Excel.
9. The predicted concentrations of NOx and SO_2 were also used to assess the potential impact on critical levels and critical loads (i.e. acid and nutrient nitrogen deposition) (see Section 3.3.2) at the assessed protected conservation areas. Details of the deposition assessment methodology are provided in Appendix B.

In addition to the above, a review of existing ambient air quality in the area was undertaken to understand the baseline conditions at the site and at receptors within the study area. These existing conditions were determined by reviewing the monitoring data already available for the area and other relevant sources of information. The review of baseline air quality is set out in Section 4.

Where appropriate, a conservative approach has been adopted throughout the assessment to increase the robustness of the model predictions. In addition, an analysis of various sensitivity scenarios has also been carried out (see Section 5.5) to determine how changes to model parameters (e.g. differing surface roughness values or modelling without considering buildings) may impact on predicted concentrations at sensitive human receptors and off-site locations.

3.3 Assessment Criteria

3.3.1 Environmental Quality Standards: Human Receptors

In the UK, the focus on local air quality is reflected in the air quality objectives (AQOs) set out in the *Air Quality Strategy for England* (Defra, 2023). The Air Quality Strategy stipulates a number of air quality objectives for nine main air pollutants with respect to ambient levels of air quality (Defra, 2023). The AQOs are similar to the limit values that were transposed from the relevant EU directives into UK legislation by *The Air Quality Standards Regulations 2010* (UK Government, 2010). The objectives are based on the current understanding of health effects of exposure to air pollutants and have been specified to control health and environmental risks to an acceptable level. They apply to places where people are regularly present over the relevant averaging period. The objectives set for the protection of human health and vegetation of relevance to the project are summarised in Table 3-1. Relevant Environmental Assessment Levels (EALs) set out in the Environment Agency guidance (Environment Agency, 2025) are also included in Table 3-1 where these supplement the AQOs.

For the purposes of reporting, the AQOs and EALs have been collectively termed as EQSs.

Table 3-1: Air quality objectives and environmental assessment levels

Pollutant	EQS[1] (µg/m³)	Concentration measured as
NO_2	40	Annual mean
	200	1-hour mean, not to be exceeded more than 18 times a year (99.79th percentile)
CO	10,000	Maximum daily 8 hour running mean (100th percentile)
	30,000	Maximum 1-hour mean (100th percentile)
SO_2	125	24-hour mean not to be exceeded more than 3 times a year (99.18th percentile)
	350	1-hour mean not to be exceeded more than 24 times a year (99.73rd percentile)
	266	15-minute mean not to be exceeded more than 35 times a year (99.9th percentile)
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded more than 35 times a year (90.41st percentile)
$PM_{2.5}$	20	Annual mean

Note 1: The EQSs presented in Table 3-1 apply to locations where public exposure may occur. As the on-site human receptor locations do not meet the relevant public exposure definition as per Defra's '*Local Air Quality Management Technical Guidance (TG22)*' (Defra, 2022), this assessment does not make comparison against the EQSs presented in Table 3-1. The results presented in Section 5 for on-site human receptors are provided for context only.

For the assessment of long-term average concentrations (i.e. the annual mean concentrations) at human receptors, impacts were described using the following criteria:

- if the PC is less than 1% of the long-term EQS, the contribution can be considered as 'insignificant' and not representative of a significant effect (i.e. not significant) (Environment Agency, 2025);
- if the PC is greater than 1% of the EQS but the PEC is less than 70% of the long-term air quality objective, based on professional judgement, this would be classed as 'not significant'; and
- where the PC is greater than 1% of the EQS and the PEC is greater than 70% of the EQS, professional judgement is used to determine the overall significance of the effect (i.e. whether the effect would be 'not significant' or 'significant'), taking account of the following:
  - the scale of the changes in concentrations;
  - whether or not an exceedance of an EQS is predicted to arise in the study area where none existed before, or an exceedance area is substantially increased as a result of the development; and
  - uncertainty, including the influence and validity of any assumptions adopted in undertaking the assessment.

For the assessment of short-term average concentrations (e.g. the 1-hour mean NO_2 concentrations, and the 15-minute, 1-hour and 24-hour mean SO_2 concentrations etc.), impacts were described using the following criteria:

- if the PC is less than 10% of the short-term EQS, this would be classed as 'insignificant' and not representative of a significant effect (i.e. not significant) (Environment Agency, 2025);
- if the PC is greater than 10% of the EQS but less than 20% of the headroom between the short-term background concentration and the EQS, based on professional judgement, this can also be described as not significant; and
- where the PC is greater than 10% of the EQS and 20% of the headroom, professional judgement is used to determine the overall significance of the effect (i.e. whether the effect would be not significant or significant) in line with the approach specified above for long-term average concentrations.

Environment Agency guidance recommends that further action will not be required if proposed emissions comply with Best Available Techniques Associated Emission Levels (BAT AELs) and resulting PECs do not exceed the relevant EQS (Environment Agency, 2025).

3.3.2 Environmental Quality Standards: Protected Conservation Areas

Critical levels

The environmental standards set for protected conservation areas of relevance to the project are summarised in Table 3-2 (Environment Agency, 2025).

Table 3-2: Air Quality Objectives and Environmental Assessment Levels for protected conservation areas

Pollutant	EQS (µg/m³)	Concentration measured as
NOx	30	Annual mean limit value for the protection of vegetation
	75	Maximum 24-hour mean for the protection of vegetation

Pollutant	EQS (µg/m^3)	Concentration measured as
SO_2	10	Annual mean limit value for the protection of vegetation where lichens or bryophytes are present
	20	Annual mean limit value for the protection of vegetation where lichens or bryophytes are not present

Critical loads

Critical loads for pollutant deposition to statutorily designated habitat sites in the UK and for various habitat types have been published by the CEH and are available from the Air Pollution Information System (APIS) website. Critical Loads are defined on the APIS website (Centre for Ecology and Hydrology, 2025) as:

"a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge".

Compliance with these benchmarks is likely to result in no significant adverse effects on the natural environment at these locations. The critical loads for the designated habitat sites considered in this assessment are set out in Table 3-3.

For the European designated sites and SSSI, the *Site Relevant Critical Loads* tool function on the APIS website was used to determine the relevant critical loads.

For the assessed local natures sites, the *Search by Location* function on the APIS website was used. Where the likely vegetation type inhabiting the assessed local nature site is unknown, the acid grassland (representing short vegetation type) and / or broadleaved, mixed and yew woodland habitat feature (representing tall vegetation type) were selected on the APIS website.

The critical loads for the designated habitat sites considered in this assessment are set out in Table 3-3.

Table 3-3: Critical loads for modelled protected conservation areas

Rec ref	Protected conservation area	Habitat feature applied	Vegetation type (for deposition velocity)	Critical load			
				Acid deposition (kEqH+/ha/year)			Nitrogen deposition (kg N/ha/year)
				CLMaxS	CLMinN	CLMaxN	Minimum
H1	Rixton Clay Pits SAC	Humid grassland, Mesophile grassland (used acid grassland as Mesophile grassland slightly acidic)	Short	0.880	0.438	1.318	5
H2	Manchester Mosses SAC	Raised and blanket bogs	Short	0.243	0.321	0.564	5
H3	Rostherne Mere Ramsar	Fen, Marsh and Swamp	Short	This habitat is not sensitive to acidity			5
H4	Midland Mere & Mosses - Phase 1 Ramsar	Fen, Marsh and Swamp	Short	This habitat is not sensitive to acidity			5
H5	Cotteril Clough SSSI & AW & LWS	Fraxinus Excelsior - Acer Campestre - Mercurialis Perennis Woodland	Tall	1.611	0.357	1.968	15
H6	Oversley Farm Wood (ID 1104307) AW & LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H7	Ancient woodland (ID 1417980)	Broadleaved deciduous woodland	Tall	1.144	0.357	1.501	10
H8	Ancient woodland (ID 1417975)	Broadleaved deciduous woodland	Tall	1.144	0.357	1.501	10
H9	Sunbank Wood (ID 1105635) AW & LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H10	Warburton Wood (ID 1105631) AW	Broadleaved deciduous woodland	Tall	1.541	0.357	1.898	10
H11	Hennersley Bank (ID 1505490) AW	Broadleaved deciduous woodland	Tall	1.541	0.357	1.898	10
H12	Bently/Tomfield Banks (ID 1105630) AW	Broadleaved deciduous woodland	Tall	1.558	0.357	1.915	10
H13	Ancient woodland (ID 1417983) AW & LWS	Broadleaved deciduous woodland	Tall	1.542	0.357	1.899	10
H14	Davenport Green Wood (ID 1505436)	Broadleaved deciduous woodland	Tall	1.574	0.357	1.931	10
H15	Bollin Bank (ID 1505489) AW & LWS	Broadleaved deciduous woodland	Tall	1.541	0.357	1.898	10
H16	Well and Double Woods LWS	Acid grassland	Short	0.900	0.438	1.338	5
H17	Road Cutting at Castle Hill LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H18	Ponds near Manchester Airport Runway LWS	Acid grassland	Short	0.900	0.438	1.338	5
H19	Bentley & Tomfield Banks LWS	Broadleaved deciduous woodland	Tall	1.557	0.357	1.914	10
H20	Ponds at Davenport Green LWS	Broadleaved deciduous woodland	Tall	1.576	0.357	1.933	10
H21	Big Wood LWS	Broadleaved deciduous woodland	Tall	1.574	0.357	1.931	10

Rec ref	Protected conservation area	Habitat feature applied	Vegetation type (for deposition velocity)	Critical load			
				Acid deposition (kEqH+/ha/year)			Nitrogen deposition (kg N/ha/year)
				CLMaxS	CLMinN	CLMaxN	Minimum
H22	Park Wood LWS	Broadleaved deciduous woodland	Tall	1.573	0.357	1.930	10
H23	Davenport Green Wood LWS	Broadleaved deciduous woodland	Tall	1.574	0.357	1.931	10
H24	Painswick Park Meadow LWS	Broadleaved deciduous woodland	Tall	1.575	0.357	1.932	10
H25	Rossmill LWS	Broadleaved deciduous woodland	Tall	1.541	0.357	1.898	10
H26	Heald Green Marsh LWS	Acid grassland	Short	0.890	0.438	1.328	5
H27	West Woodend Wood LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H28	Ecclesfield Wood LWS	Broadleaved deciduous woodland	Tall	1.543	0.357	1.900	10
H29	Wood Near Valley House LWS	Broadleaved deciduous woodland	Tall	1.144	0.357	1.501	10
H30	Styal Woods LWS	Acid grassland	Short	1.650	0.438	2.088	5
H31	East Woodend Wood LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H32	Mobberley Brook Wood LWS	Broadleaved deciduous woodland	Tall	1.542	0.357	1.899	10
H33	Round Covert LWS	Broadleaved deciduous woodland	Tall	1.543	0.357	1.900	10
H34	Jackson's Bank East LWS	Broadleaved deciduous woodland	Tall	1.074	0.357	1.431	10
H35	Wood End - Lady Lane LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H36	Fields Near Mobberley Brook LWS	Acid grassland	Short	0.890	0.438	1.328	5
H37	Town Lane Farm Sand Pit And Ponds LWS	Acid grassland	Short	0.880	0.438	1.318	5
H38	Raleigh Wood LWS	Broadleaved deciduous woodland	Tall	1.542	0.357	1.899	10
H39	Square Wood LWS	Broadleaved deciduous woodland	Tall	1.542	0.357	1.899	10
H40	Saltersley Hall Farm LWS	Acid grassland	Short	0.900	0.438	1.338	5
H41	Oversley Lodge LWS	Acid grassland	Short	0.900	0.438	1.338	5
H42	Burleyhurst Wood LWS	Broadleaved deciduous woodland	Tall	1.144	0.357	1.501	10
H43	Hooksbank Wood And Bollin Oxbows LWS	Acid grassland	Short	0.500	0.438	0.938	5
H44	Bollin Oxbow At Castle Hill LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H45	Lindow Moss & Newgate Nature Reserve LWS	Acid grassland	Short	0.258	0.366	0.624	5
H46	Mill Wood; Castle Mill LWS	Broadleaved deciduous woodland	Tall	1.542	0.357	1.899	10

Rec ref	Protected conservation area	Habitat feature applied	Vegetation type (for deposition velocity)	Critical load			
				Acid deposition (kEqH+/ha/year)			Nitrogen deposition (kg N/ha/year)
				CLMaxS	CLMinN	CLMaxN	Minimum
H47	Lindow Moss & Morley Green Heath LWS	Broadleaved deciduous woodland	Tall	0.318	0.285	0.603	10
H48	Oversley Ford Brickworks And Road Embankment LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H49	Dobbin Brook Clough LWS	Broadleaved deciduous woodland	Tall	1.681	0.357	2.038	10
H50	Norcliffe Farm, Styal LWS	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10
H51	Holly Bank Wood LWS	Broadleaved deciduous woodland	Tall	2.728	0.357	3.085	10
H52	Park Farm Grassland LWS	Acid grassland	Short	0.900	0.438	1.338	5
H53	Cotteril Clough AW	Broadleaved deciduous woodland	Tall	1.611	0.357	1.968	10

Critical load functions for acid deposition are specified on the basis of both nitrogen and sulphur derived acid. The critical load function contains a value for sulphur derived acid and two values for nitrogen derived acid deposition (a minimum and maximum value). The APIS website provides advice on how to calculate the PC (i.e. emissions from the modelled process alone) and the PEC (i.e. the PC added to the existing deposition) as a percentage of the acid critical load function and how to determine exceedances of the critical load function. This guidance was adopted for this assessment. The minimum of the range of nitrogen critical loads was used for the assessment in line with the advice on the APIS website (Centre for Ecology and Hydrology, 2025).

Significance Criteria – European designated sites (i.e. SAC and Ramsar) and SSSI

With regard to concentrations at the assessed designated habitat site, the Environment Agency guidance (Environment Agency, 2025) states emissions can be described as 'insignificant' and no further assessment is required (including the need to calculate PECs) if:

- the short-term PC is less than 10% of the short-term environmental standard for protected conservation areas; or
- the long-term PC is less than 1% of the long-term environmental standard for protected conservation areas.

Where appropriate, the significance of the predicted long-term (annual mean) concentrations or deposition at protected conservation areas were determined in line with Environment Agency guidance (Environment Agency, 2025) summarised as follows:

- Where the PC is less than 1% of the relevant critical level or critical load, the emission is not likely to have a significant effect alone or in combination irrespective of the existing concentrations or deposition rates.
- Where the PC is above 1%, further consideration of existing background concentrations or deposition rates is required, and where the total concentration or deposition is less than 70% of the critical level or critical load, calculated in combination with other committed projects or developments as appropriate, the emission is not likely to have a significant effect.
- Where the contribution is above 1%, and the total concentration or deposition rate is greater than 70% of the critical level or critical load, either alone or in combination with other committed projects or developments, then this may indicate a significant effect and further consideration is likely to be required.

The above approach is used to give a clear definition of what effects can be disregarded as 'insignificant', and which need to be considered in more detail in relation to the predicted annual mean concentrations or deposition.

For short-term mean concentrations (i.e. the 24-hour mean critical level for NOx) where the PC is less than 10% of the critical level then it would be regarded as 'insignificant'. A potentially significant effect would be identified where the short-term PC from the modelled sources would lead to the total concentration exceeding the critical level. Further consideration is likely to be required in this situation.

Significance Criteria – Local nature sites (i.e. ancient woodland and LWS)

The relevant significance criteria for these protected conservation areas are set out below.

With regard to concentrations or deposition rates at local nature sites, the Environment Agency guidance (Environment Agency, 2025) states emissions can be described as 'insignificant' and no further assessment is required (including the need to calculate PECs) if:

- the short-term PC is less than 100% of the short-term environmental standard for protected conservation areas; or
- the long-term PC is less than 100% of the long-term environmental standard for protected conservation areas.

The above approach is used to give a clear definition of what effects can be disregarded as 'insignificant', and which need to be considered in more detail in relation to the predicted annual mean concentrations or deposition.

4. Existing Environment

4.1 Location

Manchester Airport is located approximately 14 km south-southwest from the centre of the city of Manchester in the metropolitan county of Greater Manchester. The M56 motorway is adjacent to the northern and eastern boundary of the site with open grassland and woodland adjacent to the southern and western boundary. Beyond the M56 are the residential developments of Warburton Green and Woodhouse Park.

There are several sensitive human and ecological receptors in the vicinity of the site in respect of potential air emissions from the process. The most relevant sensitive receptors have been identified from local mapping and are summarised in Appendix A and presented in Figure 2 and Figure 3.

4.2 Local Air Quality Management (LAQM)

A review of baseline air quality was carried out prior to undertaking the air quality assessment. This was carried out to determine the availability of baseline air quality data recorded in the vicinity of the site and also if data from other regional or national sources such as the UK Air Information Resource (UK-AIR) (Defra, 2025b) website could be used to represent background concentrations of the relevant pollutants in the vicinity of the site.

As part of the LAQM process, GMCA has declared an AQMA, termed 'Greater Manchester Combined Authority AQMA') for elevated concentrations of annual mean NO_2 and 24-hour mean PM_{10} concentrations. This AQMA encompasses an area covering the 10 districts of Greater Manchester including arterial routes, district centres and parts of Manchester Airport (see Figure 4). The closest section of the AQMA to the site , has been included in the assessment accordingly.

The GMCA carries out regular assessments and monitoring of air quality within the Greater Manchester authorities as part of the LAQM process. The most recent Air Quality Annual Status Reports (GMCA, 2024) was reviewed to determine the concentrations of NO_2, particulates and SO_2 in the vicinity for the site. Furthermore, in partnership with Manchester City Council, MAG also carries out on-site and off-site air quality monitoring.

Table 4-1 present information on the nearest monitoring locations to the site (see Figure 4).

Table 4-1: Nearest monitoring locations to the site

Site ID	Description	Site type	Location	Distance and direction from approximate site centre	Pollutants monitored	2023 Annual mean concentration (µg/m^3)
GMCA						
Automatic monitoring						
MAHG	Manchester Sharston	Suburban	E 384179 N 386086	2.81 km, ENE	NO_2, PM_{10}, $PM_{2.5}$, SO_2	14.7 (NO_2) 11 (PM_{10}) 6 ($PM_{2.5}$) SO_2, 0 reported exceedances of 24-hr mean EQS (i.e. 125 ug/m^3)
STK7	Stockport Cheadle A34	Roadside	E 385047 N 388339	4.83 km, NE	NO_2, PM_{10}	26 (NO_2) 13 (PM_{10})
Non-automatic monitoring (diffusion tubes)						
MA90BNO, MA91BNO, MA92BNO	92	Suburban	E 384202 N 386121	2.84 km, ENE	NO_2	14.2
ST13NO	ST 13	Urban Background	E 384675 N 386295	3.35 km, ENE	NO_2	12.5
TR24NO	24	Roadside	E 379263 N 385812	2.51 km, WNW	NO_2	18.5
Manchester City Council and MAG						
Automatic monitoring						
Daisy Bank Lane[2]	Off-site location	n/a	E 384207 N 386040	2.82 km, ENE	NO_2	11.8
Non-automatic monitoring (diffusion tubes)						
T2 Traffic Crossing	On-site location	-	E 381725 N 385309	Within airport	NO_2	28.7
Stand 69	On-site location	-	E 381022 N 385235	Within airport	NO_2	20.8
B1D	On-site location	-	E 381635 N 384787	Within airport	NO_2	29.9 (2022)[1]
Stand 42	On-site location	-	E 382046 N384853	Within airport	NO_2	24.7
05L Localiser	On-site location	-	E 383235 N385225	Within airport	NO_2	17.9
05R Localiser	On-site location	-	E 382150 N383839	Within airport	NO_2	11.7
05R Glidepath	On-site location	-	n/a	Within airport	NO_2	8.8
Crash Gate 13	On-site location	-	E 380764 N383069	Within airport	NO_2	12.8
Styal Road	Off-site location	-	E 383906 N385826	2.46 km, ENE	NO_2	11.7
Outwood Lame	On-site location	-	E 382071 N385119	Within airport	NO_2	32.0

Site ID	Description	Site type	Location	Distance and direction from approximate site centre	Pollutants monitored	2023 Annual mean concentration (µg/m^3)
T1 Departures A	On-site location	-	E 381846 N385131	Within airport	NO_2	41.5
Daisy Bank Lane[2]	Off-site location	-	E 384207 N386040	2.82 km, ENE	NO_2	11.8
Stand 212	On-site location	-	E 381342 N385571	Within airport	NO_2	21.7
Toronto Avenue	On-site location	-	E 381816 N385314	Within airport	NO_2	29.2
ATC Tower	On-site location	-	E 381419 N 384546	Within airport	NO_2	19.8
Little West Gate	On-site location	-	E 381087 N384858	Within airport	NO_2	20.7
T3 Departures	On-site location	-	E 382213 N385028	Within airport	NO_2	29.4
Stand 56	On-site location	-	E 382389 N385047	Within airport	NO_2	19.2
Stand 112	On-site location	-	E 380917 N 385725	Within airport	NO_2	24.6
Stand 12	On-site location	-	E 381806 N 384654	Within airport	NO_2	26.2

Note 1: Data capture for 2023 <25%.

Note 2: Co-located.

Information on background air quality in the vicinity of the site was also obtained from Defra background map datasets (Defra, 2025b). The 2021-based background maps by Defra are estimates based upon the principal local and regional sources of emissions and ambient monitoring data. For SO_2 and CO concentrations, the 2001-based background maps were used, which are the latest available. These background concentrations are presented in Table 4-2.

As it is necessary to determine the potential impact of emissions from the site at the assessed protected conservation areas, the background concentrations of NOx and SO_2 were also identified. These background concentrations were also obtained from the Defra background map datasets (Defra, 2025b) and are displayed in Table 4-2.

Table 4-2: Background concentrations: adopted for use in the assessment for human receptors and protected conservation areas

Pollutant	Annual mean concentration ($\mu g/m^3$)	Description
Human receptors		
NO_2	7.0 – 20.4	Defra 1 km x 1 km background map value for the assessed sensitive human receptor locations, 2025 map concentration
CO	150 - 191	Defra 1 km x 1 km background map value for the assessed sensitive human receptor locations, 2001 based map concentration
PM_{10}	10.2 – 13.5	Defra 1 km x 1 km background map value for the assessed sensitive human receptor locations, 2025 map concentration
$PM_{2.5}$	5.9 – 7.2	Defra 1 km x 1 km background map value for the assessed sensitive human receptor locations, 2025 map concentration
SO_2	4.5 – 8.4	Defra 1 km x 1 km background map value for the assessed sensitive human receptor locations, 2001 based map concentration
Protected conservation areas		
NOx	8.0 – 52.1[1]	Defra 1 km x 1 km background map value for the assessed protected conservation areas, 2025 map concentration
SO_2	4.5 – 10.0	Defra 1 km x 1 km background map value for the assessed sensitive human receptor locations, 2001 based map concentration

Note 1: The maximum annual mean NOx concentration is predicted to occur at NGR E 380500 N 385500 (Defra, 2025b).

4.2.1 Background Concentrations Applied in the Assessment

For the assessed on-site human receptors (i.e. hotels and car parks), the background annual mean NO_2 concentration recorded at monitoring location *05R Localiser* (see Table 4-1 and Figure 4), has been applied in the assessment. This diffusion tube is located approximately 0.4 km south of runway 05L / 23R and 0.6 km northeast of runway 5R / 23L and would primarily be subject to aviation emissions and to a lesser extent, emissions from the assessed combustion plant during operation. Although this may represent some degree of double counting of emissions from the combustion plant, this is considered a suitable and conservative approach to the assessment. For the remaining pollutants, the Defra background map concentrations presented in Table 4-2 have been applied for the assessed sensitive human on-site human receptors.

For the assessed off-site human receptors (i.e. residential properties and hotels) and protected conservation areas, the Defra background map concentrations presented in Table 4-2 have been applied. It should be noted the background NO_2 concentrations applied at off-site human receptors adjacent to the northern boundary of the site are generally higher than the measured NO_2 concentrations recorded at 05R Localiser (i.e. 11.7 $\mu g/m^3$), Crash Gate 13 (i.e. 12.8 $\mu g/m^3$), Daisy Bank Lane (i.e. 11.8 $\mu g/m^3$) and Styal Road (i.e. 11.7 $\mu g/m^3$) monitoring locations. This represent a conservative approach to the assessment.

As discussed above, this may represent some degree of double counting of emissions from the combustion plant.

The long-term background concentrations were doubled to estimate the short-term background concentrations in line with the Environment Agency guidance (Environment Agency, 2024).

4.3 Existing Deposition Rates

Existing acid and nutrient nitrogen deposition levels were obtained from APIS (Centre for Ecology and Hydrology, 2025). As a conservative approach to the assessment, it is assumed the vegetation type selected is present at the specific modelled location within the assessed protected conservation area. The existing deposition values at the assessed ecological designations are set out in Table 4-3.

Table 4-3: Existing deposition at modelled habitat sites

Rec ref	Protected conservation area	Vegetation type (for deposition velocity)	Existing deposition rates		
			Existing acid deposition (kEqH+/ha/year)		Existing nutrient N deposition (kg N/ha/year)
			(N)	(S)	Nitrogen
H1	Rixton Clay Pits SAC	Short	1.34	0.21	18.78
H2	Manchester Mosses SAC	Short	1.31	0.23	18.30
H3	Rostherne Mere Ramsar	Short	1.44	0.19	20.17
H4	Midland Mere & Mosses - Phase 1 Ramsar	Short	1.52	0.18	21.30
H5	Cotteril Clough SSSI & AW & LWS	Tall	2.40	0.27	33.50
H6	Oversley Farm Wood (ID 1104307) AW & LWS	Tall	2.40	0.27	33.55
H7	Ancient woodland (ID 1417980)	Tall	2.41	0.27	33.71
H8	Ancient woodland (ID 1417975)	Tall	2.41	0.27	33.71
H9	Sunbank Wood (ID 1105635) AW & LWS	Tall	2.41	0.26	33.67
H10	Warburton Wood (ID 1105631) AW	Tall	2.43	0.26	33.95
H11	Hennersley Bank (ID 1505490) AW	Tall	2.43	0.26	33.95
H12	Bently/Tomfield Banks (ID 1105630) AW	Tall	2.44	0.25	34.12
H13	Ancient woodland (ID 1417983) AW & LWS	Tall	2.43	0.25	34.08
H14	Davenport Green Wood (ID 1505436)	Tall	2.39	0.26	33.53
H15	Bollin Bank (ID 1505489) AW & LWS	Tall	2.43	0.26	33.95
H16	Well and Double Woods LWS	Short	1.37	0.21	19.24
H17	Road Cutting at Castle Hill LWS	Tall	2.42	0.26	33.81
H18	Ponds near Manchester Airport Runway LWS	Short	1.37	0.21	19.24
H19	Bentley & Tomfield Banks LWS	Tall	2.42	0.26	33.82
H20	Ponds at Davenport Green LWS	Tall	2.38	0.26	33.38
H21	Big Wood LWS	Tall	2.32	0.27	32.43
H22	Park Wood LWS	Tall	2.31	0.27	32.28
H23	Davenport Green Wood LWS	Tall	2.39	0.26	33.53
H24	Painswick Park Meadow LWS	Tall	2.36	0.27	33.07
H25	Rossmill LWS	Tall	2.43	0.26	33.95
H26	Heald Green Marsh LWS	Short	1.31	0.21	18.33
H27	West Woodend Wood LWS	Tall	2.42	0.26	33.81
H28	Ecclesfield Wood LWS	Tall	2.45	0.25	34.34
H29	Wood Near Valley House LWS	Tall	2.41	0.27	33.71
H30	Styal Woods LWS	Short	1.36	0.26	18.97
H31	East Woodend Wood LWS	Tall	2.43	0.26	33.96
H32	Mobberley Brook Wood LWS	Tall	2.58	0.24	36.16
H33	Round Covert LWS	Tall	2.45	0.25	34.34
H34	Jackson's Bank East LWS	Tall	2.45	0.25	34.23
H35	Wood End - Lady Lane LWS	Tall	2.43	0.26	33.96
H36	Fields Near Mobberley Brook LWS	Short	1.45	0.19	20.35
H37	Town Lane Farm Sand Pit And Ponds LWS	Short	1.48	0.18	20.77
H38	Raleigh Wood LWS	Tall	2.54	0.23	35.51
H39	Square Wood LWS	Tall	2.54	0.23	35.51
H40	Saltersley Hall Farm LWS	Short	1.39	0.20	19.44

Rec ref	Protected conservation area	Vegetation type (for deposition velocity)	Existing deposition rates		
			Existing acid deposition (kEqH+/ha/year)		Existing nutrient N deposition (kg N/ha/year)
			(N)	(S)	Nitrogen
H41	Oversley Lodge LWS	Short	1.35	0.22	18.89
H42	Burleyhurst Wood LWS	Tall	2.41	0.27	33.71
H43	Hooksbank Wood And Bollin Oxbows LWS	Short	1.37	0.21	19.17
H44	Bollin Oxbow At Castle Hill LWS	Tall	2.42	0.26	33.81
H45	Lindow Moss & Newgate Nature Reserve LWS	Short	1.38	0.21	19.28
H46	Mill Wood; Castle Mill LWS	Tall	2.43	0.25	34.08
H47	Lindow Moss & Morley Green Heath LWS	Tall	2.42	0.26	33.88
H48	Oversley Ford Brickworks And Road Embankment LWS	Tall	2.40	0.27	33.55
H49	Dobbin Brook Clough LWS	Tall	2.29	0.25	32.02
H50	Norcliffe Farm, Styal LWS	Tall	2.36	0.26	33.01
H51	Holly Bank Wood LWS	Tall	2.38	0.27	33.29
H52	Park Farm Grassland LWS	Short	1.42	0.19	19.93
H53	Cotteril Clough AW	Tall	2.39	0.27	33.39

5. Results

5.1 Off-site Human Receptors

The results presented below are the maximum modelled concentrations predicted at any of the 47 assessed off-site sensitive human receptor locations, 'Greater Manchester Combined Authority AQMA' and the maximum modelled concentrations at any off-site location for the five years of meteorological data used in the study.

The results of the dispersion modelling are set out in Table 5-1, which presents the following information:

- EQS (i.e. the relevant air quality standard);
- estimated annual mean background concentration (see Section 4) that is representative of the baseline;
- PC, the maximum modelled concentrations due to the emissions from the assessed combustion plant;
- PEC, the maximum modelled concentration due to process emissions combined with estimated baseline concentrations; and
- PC and PEC as a percentage of the EQS; and
- PC as a percentage of headroom (i.e. the PC as a percentage of the difference between the short-term background concentration and the EQS, for short-term predictions only).

The full results at assessed human receptor locations are presented in Appendix C.

Table 5-1: Results of detailed assessment at off-site locations

Pollutant	Averaging period	Assessment location	Location where maximum PC predicted	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC / EQS (%)	PEC / EQS (%)	PC as a percentage of headroom (%)
CO	Maximum 8-hour running mean	Off-site sensitive locations	R21	10,000	353.9	63.2	417.0	0.6%	4.2%	0.7%
	Maximum 1-hour mean	Off-site	E 381077 N 384018	30,000	350.2	337.1	687.3	1.1%	2.3%	1.1%
		Off-site sensitive locations	R21	30,000	353.9	89.1	443.0	0.3%	1.5%	0.3%
NO_2	Annual mean	Off-site sensitive locations	R1	40	15.8	2.0	17.7	5.0%	44.3%	-
		Greater Manchester Combined Authority AQMA	E 381317 N 386078	40	n/a[1]	4.3	n/a[1]	10.8%	-	-
	1-hour mean (99.79th percentile)	Off-site	E 381477 N 383118	200	29.0	716.4	745.4	358.2%	**372.7%**	418.9%
		Off-site sensitive locations	R20	200	24.4	71.1	95.5	35.6%	47.8%	40.5%
SO_2	24-hour mean (99.18th percentile)	Off site sensitive locations	R22	125	14.3	0.1	14.3	<0.1%	11.5%	0.1%
	1-hour mean (99.73rd percentile)	Off-site	E 381297 N 386058	350	10.1	2.3	12.5	0.7%	3.6%	0.7%
		Off-site sensitive locations	R22	350	14.3	0.1	14.4	<0.1%	4.1%	<0.1%
	15-minute mean (99.9th percentile)	Off-site	E 381297 N 386058	266	10.1	2.4	12.6	0.9%	4.7%	1.0%
		Off-site sensitive locations	R35	266	10.8	0.3	11.1	0.1%	4.2%	0.1%

Pollutant	Averaging period	Assessment location	Location where maximum PC predicted	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC / EQS (%)	PEC / EQS (%)	PC as a percentage of headroom (%)
PM_{10}	Annual mean	Off-site sensitive locations	R1	40	13.5	0.01	13.5	<0.1%	33.9%	-
	24-hour mean (90.41st percentile)	Off-site sensitive locations	R21	50	21.2	0.85	22.1	1.7%	44.1%	3.0%
		Greater Manchester Combined Authority AQMA	E 381317 N 386078	50	n/a[1]	7.89	n/a[1]	15.8%	-	-
$PM_{2.5}$	Annual mean	Off site sensitive locations	R1	20	7.2	0.01	7.2	0.1%	36.0%	-

Bold denotes exceedance of the EQS

The full results are presented in Appendix D.

Note 1: Defra background concentration (Defra, 2025) has not been applied for the Greater Manchester Combined Authority AQMA.

Off-site sensitive human receptor locations

The results in Table 5-1 indicate that the predicted modelled concentrations at sensitive off-site human receptors do not exceed any relevant long-term or short-term EQS.

Table 5-1 indicates that for annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations, the respective PCs are either less than 1% of the relevant long-term EQS or where the PCs are above 1% of the relevant EQS (i.e. NO_2), the PEC is less than 70% of the relevant EQS and the impacts are considered 'not significant' as per Environment Agency guidance (Environment Agency, 2025).

For short-term NO_2, CO, SO_2 and particulate concentrations, the PCs are either less than 10% of the relevant EQS or where the PCs are above 10% of the relevant EQS (i.e. NO_2), the respective PEC is less than 70% of the relevant EQS and the impacts are considered 'not significant'.

Off-site modelled locations

For short-term CO and SO_2 concentrations, the PCs are less than 10% of the relevant EQS and the impacts are considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

For 1-hour mean NO_2 (99.79th percentile) concentrations, the PC is considerably high and the corresponding PEC exceeds the relevant standard. The highest PC is predicted to occur at NGR E 381477 N 383118, which is located at the southern fenceline of the site approximately 40 m east-southeast of GEN24. Although just beyond the site fenceline, this location is not accessible to members of the public. Further analysis indicates that none of the off-site locations where an exceedance of the short-term NO_2 EQS is predicted (i.e. adjacent to GEN04 / GEN05, GEN 15, GEN21 / GEN 22, GEN24 / GEN 25), are accessible to members of the public. For those locations that are accessible to members of the public, the highest concentration (i.e. 178.6 µg/m^3) is predicted to occur on Woodend Lane adjacent to the southern boundary of the site. As there are no footpaths along this lane, it is reasonable to assume that a member of the public would not be exposed for an hour or more at this location.

For short-term predicted concentrations, the assessed generators are assumed to operate on a continuous basis throughout the year to capture the worst possible meteorological conditions. This is a conservative approach as in practice GEN24 operates for less than 150 hours per year (reducing to approximately 12 hours per year from May 2025 onwards) and it is unlikely that the operation of GEN24 would coincide with all of the worst meteorological conditions each year.

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Table 5-1 indicates that for annual mean NO_2 and 24-hour mean (90.41st percentile) PM_{10} concentrations, the respective PCs are less than 16% of the relevant EQS. The highest PCs are predicted to occur at NGR E 381317 N 386078, which is located in hedgerow between GEN15 and the M56 motorway, in an area not accessible to members of the public. It should be noted there are no residential properties in the vicinity of this location.

It should be noted GEN15, which is the greatest contributor of PCs at this location, typically operates for 25 hours per year (see Table 2-1). For predicted annual mean NO_2 concentrations, GEN15 is assumed to operate for 250 hours per year and for 24-hour mean (90.41st percentile) PM_{10} concentrations, GEN15 is assumed to operate on a continuous basis. Therefore, the results are presented are likely to be higher than would reasonably be expected.

For those locations that are accessible to members of the public, the highest concentrations are predicted to occur on the footpaths along Outwood Lane.

5.2 On-site Human Receptors

Table 5-2. Results of detailed assessment at on-site locations

Pollutant	Averaging period	Assessment location	Location where maximum PC predicted	EQS (µg/m^3)	Baseline air quality level (µg/m^3)	PC (µg/m^3)	PEC (µg/m^3)	PC / EQS (%)	PEC / EQS (%)	PC as a percentage of headroom (%)
CO	Maximum 1-hour mean	On-site sensitive locations	R55	30,000	363.0	187.5	550.5	0.6%	1.8%	0.6%
NO_2	1-hour mean (99.79th percentile)	On-site sensitive locations	R52	200	23.4	429.6	453.0	214.8%	**226.5%**	243.3%
SO_2	1-hour mean (99.73rd percentile)	On-site sensitive locations	R52	350	12.6	0.9	13.4	0.2%	3.8%	0.3%
	15-minute mean (99.9th percentile)	On-site sensitive locations	R52	266	12.6	1.2	13.8	0.5%	5.2%	0.5%

Bold denotes exceedance of the EQS

On-site sensitive human receptor locations

As discussed in Section 3.3, the EQSs do not apply to on-site receptors as they do not meet the relevant public exposure definition as per Defra's LAQM (TG22) (Defra, 2022). Therefore, the results are presented and discussed for information purposes only.

For short-term CO and SO_2 concentrations, the PCs are less than 10% of the relevant EQS and the impacts are considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

For 1-hour mean NO_2 (99.79th percentile) concentrations, the PC is elevated and the corresponding PEC exceeds the relevant EQS. The highest PC is predicted to occur at R52, which represents a parking space on the upper floor of the T2 West multi-storey car park, adjacent to the A24 boiler stacks. As this receptor represents an airport parking space, it is reasonable to assume that a member of the public would not be exposed for an hour or more at this location.

5.3 Summary

The conservative approach adopted throughout the assessment means the predicted concentrations presented in Table 5-1 and Table 5-2 are likely to be considerably higher than would reasonably be expected.

Based on the findings of the assessment, the overall impact is considered 'not significant' for sensitive human receptor locations.

Isopleths (see Figures 5 and 6) have been produced for annual mean and 1-hour mean (99.79th percentile) NO_2 concentrations. The figures are based on the year of meteorological data which resulted in the highest PC at a sensitive off-site human receptor location.

5.4 Protected Conservation Areas

5.4.1 Assessment against Critical Levels

The environmental effects of releases from the site at the assessed protected conservation areas has been determined by comparing predicted concentrations of released substances with the EQSs for the protection of vegetation (critical levels) (see Table 3-2). The results of the detailed modelling at the assessed protected conservation areas are shown in Table 5-3. The results presented are the maximum predicted concentrations at the modelled locations for the five years of meteorological data used in the study area.

For SO_2 PCs, the relevant EQS was based on the assumption that lichens and bryophytes were present at the assessed protected conservation areas, therefore adopting the more stringent critical level of 10 µg/m^3 (compared to 20 µg/m^3) as a conservative approach.

Table 5-3: Results of detailed assessment at assessed protected conservation sites for annual mean NOx and SO_2 concentrations and for maximum 24-hour mean NOx concentrations

Rec ref	Protected Conservation Area	EQS (µg/m³)	Background concentration (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
Annual mean NOx concentrations							
H1	Rixton Clay Pits SAC	30	12.1	0.05	12.2	0.2%	40.6%
H2	Manchester Mosses SAC		12.4	0.04	12.4	0.1%	41.4%
H3	Rostherne Mere Ramsar		14.5	0.12	14.6	0.4%	48.6%
H4	Midland Mere & Mosses - Phase 1 Ramsar		8.4	0.07	8.5	0.2%	28.2%
H5	Cotteril Clough SSSI & AW & LWS		39.6	1.15	40.7	3.8%	**135.8%**
H6	Oversley Farm Wood (ID 1104307) AW & LWS		39.6	0.27	39.9	0.9%	**132.9%**
H7	Ancient woodland (ID 1417980)		10.8	0.18	11.0	0.6%	36.7%
H8	Ancient woodland (ID 1417975)		10.8	0.10	10.9	0.3%	36.5%
H9	Sunbank Wood (ID 1105635) AW & LWS		45.7	0.66	46.3	2.2%	**154.4%**
H10	Warburton Wood (ID 1105631) AW		29.7	0.36	30.0	1.2%	**100.2%**
H11	Hennersley Bank (ID 1505490) AW		29.7	0.40	30.1	1.3%	**100.3%**
H12	Bently/Tomfield Banks (ID 1105630) AW		12.4	0.28	12.7	0.9%	42.2%
H13	Ancient woodland (ID 1417983) AW & LWS		10.6	0.26	10.8	0.9%	36.1%
H14	Davenport Green Wood (ID 1505436)		52.1	0.75	52.8	2.5%	**176.1%**
H15	Bollin Bank (ID 1505489) AW & LWS		29.7	0.42	30.1	1.4%	**100.4%**
H16	Well and Double Woods LWS		25.2	0.40	25.6	1.3%	85.3%
H17	Road Cutting at Castle Hill LWS		25.2	2.03	27.2	6.8%	90.7%
H18	Ponds near Manchester Airport Runway LWS		25.2	13.88	39.1	46.3%	**130.2%**
H19	Bentley & Tomfield Banks LWS		14.3	0.31	14.6	1.0%	48.6%
H20	Ponds at Davenport Green LWS		19.6	0.58	20.2	1.9%	67.2%
H21	Big Wood LWS		33.5	0.43	33.9	1.4%	**113.1%**
H22	Park Wood LWS		32.3	0.43	32.7	1.4%	**109.1%**

Rec ref	Protected Conservation Area	EQS (µg/m^3)	Background concentration (µg/m^3)	PC (µg/m^3)	PEC (µg/m^3)	PC/EQS (%)	PEC/EQS (%)
H23	Davenport Green Wood LWS		52.1	0.74	52.8	2.5%	**176.1%**
H24	Painswick Park Meadow LWS		43.2	2.55	45.8	8.5%	**152.5%**
H25	Rossmill LWS		29.7	0.37	30.1	1.2%	**100.2%**
H26	Heald Green Marsh LWS		15.2	0.22	15.5	0.7%	51.6%
H27	West Woodend Wood LWS		25.2	0.28	25.5	0.9%	84.9%
H28	Ecclesfield Wood LWS		9.9	0.20	10.1	0.7%	33.7%
H29	Wood Near Valley House LWS		10.8	0.21	11.1	0.7%	36.8%
H30	Styal Woods LWS		13.8	0.34	14.2	1.1%	47.3%
H31	East Woodend Wood LWS		10.0	0.22	10.3	0.7%	34.2%
H32	Mobberley Brook Wood LWS		8.0	0.03	8.0	0.1%	26.7%
H33	Round Covert LWS		9.9	0.20	10.1	0.7%	33.7%
H34	Jackson's Bank East LWS		13.3	0.27	13.6	0.9%	45.4%
H35	Wood End - Lady Lane LWS		10.0	9.57	19.6	31.9%	65.4%
H36	Fields Near Mobberley Brook LWS		8.3	0.05	8.4	0.2%	28.0%
H37	Town Lane Farm Sand Pit And Ponds LWS		8.5	0.04	8.5	0.1%	28.3%
H38	Raleigh Wood LWS		8.7	0.10	8.8	0.3%	29.4%
H39	Square Wood LWS		8.7	0.09	8.8	0.3%	29.3%
H40	Saltersley Hall Farm LWS		9.0	0.06	9.1	0.2%	30.3%
H41	Oversley Lodge LWS		46.1	0.45	46.6	1.5%	**155.2%**
H42	Burleyhurst Wood LWS		10.8	0.10	10.9	0.3%	36.5%
H43	Hooksbank Wood And Bollin Oxbows LWS		10.8	0.31	11.1	1.0%	37.2%
H44	Bollin Oxbow At Castle Hill LWS		25.2	0.38	25.6	1.3%	85.2%
H45	Lindow Moss & Newgate Nature Reserve LWS		9.4	0.08	9.5	0.3%	31.5%
H46	Mill Wood; Castle Mill LWS		10.6	0.37	10.9	1.2%	36.4%

Rec ref	Protected Conservation Area	EQS (µg/m^3)	Background concentration (µg/m^3)	PC (µg/m^3)	PEC (µg/m^3)	PC/EQS (%)	PEC/EQS (%)
H47	Lindow Moss & Morley Green Heath LWS		9.4	0.08	9.5	0.3%	31.5%
H48	Oversley Ford Brickworks And Road Embankment LWS		39.6	12.99	52.6	43.3%	**175.3%**
H49	Dobbin Brook Clough LWS		12.1	0.19	12.3	0.6%	41.1%
H50	Norcliffe Farm, Styal LWS		11.0	0.13	11.1	0.4%	37.0%
H51	Holly Bank Wood LWS		13.8	0.23	14.1	0.8%	46.9%
H52	Park Farm Grassland LWS		8.4	0.05	8.5	0.2%	28.2%
H53	Cotteril Clough AW		51.2	1.59	52.8	5.3%	**175.9%**
Annual mean SO_2 concentrations							
H1	Rixton Clay Pits SAC	10	4.9	1.38E-05	4.9	<0.1%	49.0%
H2	Manchester Mosses SAC		5.1	1.20E-05	5.1	<0.1%	51.2%
H3	Rostherne Mere Ramsar		4.7	2.98E-05	4.7	<0.1%	47.2%
H4	Midland Mere & Mosses - Phase 1 Ramsar		4.8	2.00E-05	4.8	<0.1%	48.2%
H5	Cotteril Clough SSSI & AW & LWS		5.1	6.57E-04	5.1	<0.1%	51.3%
H6	Oversley Farm Wood (ID 1104307) AW & LWS		5.1	1.04E-04	5.1	<0.1%	51.3%
H7	Ancient woodland (ID 1417980)		4.7	7.60E-05	4.7	<0.1%	46.9%
H8	Ancient woodland (ID 1417975)		4.7	3.94E-05	4.7	<0.1%	46.9%
H9	Sunbank Wood (ID 1105635) AW & LWS		4.8	1.44E-04	4.8	<0.1%	48.4%
H10	Warburton Wood (ID 1105631) AW		4.7	7.80E-05	4.7	<0.1%	47.3%
H11	Hennersley Bank (ID 1505490) AW		4.7	8.91E-05	4.7	<0.1%	47.3%
H12	Bently/Tomfield Banks (ID 1105630) AW		4.8	6.70E-05	4.8	<0.1%	47.8%
H13	Ancient woodland (ID 1417983) AW & LWS		4.7	7.27E-05	4.7	<0.1%	47.3%
H14	Davenport Green Wood (ID 1505436)		5.1	1.89E-04	5.1	<0.1%	50.8%
H15	Bollin Bank (ID 1505489) AW & LWS		4.7	9.76E-05	4.7	<0.1%	47.3%
H16	Well and Double Woods LWS		4.9	1.79E-04	4.9	<0.1%	49.0%

Rec ref	Protected Conservation Area	EQS (µg/m^3)	Background concentration (µg/m^3)	PC (µg/m^3)	PEC (µg/m^3)	PC/EQS (%)	PEC/EQS (%)
H17	Road Cutting at Castle Hill LWS		4.9	1.83E-03	4.9	<0.1%	49.0%
H18	Ponds near Manchester Airport Runway LWS		4.9	1.43E-02	4.9	0.1%	49.1%
H19	Bentley & Tomfield Banks LWS		4.8	7.48E-05	4.8	<0.1%	48.1%
H20	Ponds at Davenport Green LWS		4.9	1.39E-04	4.9	<0.1%	48.7%
H21	Big Wood LWS		5.3	1.06E-04	5.3	<0.1%	52.6%
H22	Park Wood LWS		5.1	9.38E-05	5.1	<0.1%	50.8%
H23	Davenport Green Wood LWS		5.1	1.88E-04	5.1	<0.1%	50.8%
H24	Painswick Park Meadow LWS		5.1	6.70E-04	5.1	<0.1%	50.6%
H25	Rossmill LWS		4.7	8.04E-05	4.7	<0.1%	47.3%
H26	Heald Green Marsh LWS		10.0	5.41E-05	10.0	<0.1%	99.8%
H27	West Woodend Wood LWS		4.9	1.17E-04	4.9	<0.1%	49.0%
H28	Ecclesfield Wood LWS		4.6	5.15E-05	4.6	<0.1%	46.1%
H29	Wood Near Valley House LWS		4.7	1.02E-04	4.7	<0.1%	46.9%
H30	Styal Woods LWS		4.8	9.03E-05	4.8	<0.1%	48.0%
H31	East Woodend Wood LWS		4.7	9.50E-05	4.7	<0.1%	46.6%
H32	Mobberley Brook Wood LWS		4.7	9.47E-06	4.7	<0.1%	46.8%
H33	Round Covert LWS		4.6	5.37E-05	4.6	<0.1%	46.1%
H34	Jackson's Bank East LWS		4.6	5.94E-05	4.6	<0.1%	46.3%
H35	Wood End - Lady Lane LWS		4.7	5.54E-03	4.7	<0.1%	46.7%
H36	Fields Near Mobberley Brook LWS		4.6	1.57E-05	4.6	<0.1%	46.0%
H37	Town Lane Farm Sand Pit And Ponds LWS		5.8	1.28E-05	5.8	<0.1%	57.8%
H38	Raleigh Wood LWS		4.5	2.79E-05	4.5	<0.1%	44.5%
H39	Square Wood LWS		4.5	2.72E-05	4.5	<0.1%	44.5%
H40	Saltersley Hall Farm LWS		4.5	2.11E-05	4.5	<0.1%	44.7%

Rec ref	Protected Conservation Area	EQS (µg/m^3)	Background concentration (µg/m^3)	PC (µg/m^3)	PEC (µg/m^3)	PC/EQS (%)	PEC/EQS (%)
H41	Oversley Lodge LWS		7.1	1.29E-04	7.1	<0.1%	71.3%
H42	Burleyhurst Wood LWS		4.7	3.80E-05	4.7	<0.1%	46.9%
H43	Hooksbank Wood And Bollin Oxbows LWS		4.7	1.54E-04	4.7	<0.1%	46.9%
H44	Bollin Oxbow At Castle Hill LWS		4.9	1.40E-04	4.9	<0.1%	49.0%
H45	Lindow Moss & Newgate Nature Reserve LWS		4.5	2.80E-05	4.5	<0.1%	44.5%
H46	Mill Wood; Castle Mill LWS		4.7	9.54E-05	4.7	<0.1%	47.3%
H47	Lindow Moss & Morley Green Heath LWS		4.5	2.80E-05	4.5	<0.1%	44.5%
H48	Oversley Ford Brickworks And Road Embankment LWS		5.1	7.52E-03	5.1	0.1%	51.4%
H49	Dobbin Brook Clough LWS		4.9	4.91E-05	4.9	<0.1%	49.4%
H50	Norcliffe Farm, Styal LWS		4.8	3.96E-05	4.8	<0.1%	48.2%
H51	Holly Bank Wood LWS		4.8	9.18E-05	4.8	<0.1%	48.0%
H52	Park Farm Grassland LWS		4.5	1.45E-05	4.5	<0.1%	44.7%
H53	Cotteril Clough AW		5.4	3.51E-04	5.4	<0.1%	54.2%
Maximum 24-hour mean NOx concentrations							
H1	Rixton Clay Pits SAC	75	24.3	7.6	31.8	10.1%	42.5%
H2	Manchester Mosses SAC		24.8	6.4	31.2	8.5%	41.5%
H3	Rostherne Mere Ramsar		28.9	16.4	45.3	21.8%	60.4%
H4	Midland Mere & Mosses - Phase 1 Ramsar		16.8	10.8	27.6	14.4%	36.8%
H5	Cotteril Clough SSSI & AW & LWS		79.2	55.7	134.9	74.3%	**179.8%**
H6	Oversley Farm Wood (ID 1104307) AW & LWS		79.2	33.5	112.7	44.7%	**150.3%**
H7	Ancient woodland (ID 1417980)		21.7	35.7	57.4	47.6%	76.5%
H8	Ancient woodland (ID 1417975)		21.7	15.7	37.3	20.9%	49.8%
H9	Sunbank Wood (ID 1105635) AW & LWS		91.3	37.7	129.0	50.3%	**172.1%**
H10	Warburton Wood (ID 1105631) AW		59.4	24.8	84.2	33.1%	**112.3%**

Rec ref	Protected Conservation Area	EQS (µg/m^3)	Background concentration (µg/m^3)	PC (µg/m^3)	PEC (µg/m^3)	PC/EQS (%)	PEC/EQS (%)
H11	Hennersley Bank (ID 1505490) AW		59.4	29.7	89.1	39.6%	**118.8%**
H12	Bently/Tomfield Banks (ID 1105630) AW		24.8	21.8	46.6	29.1%	62.1%
H13	Ancient woodland (ID 1417983) AW & LWS		21.1	22.0	43.1	29.3%	57.5%
H14	Davenport Green Wood (ID 1505436)		104.2	40.7	144.9	54.3%	**193.2%**
H15	Bollin Bank (ID 1505489) AW & LWS		59.4	30.8	90.2	41.1%	**120.2%**
H16	Well and Double Woods LWS		50.3	42.1	92.4	56.1%	**123.2%**
H17	Road Cutting at Castle Hill LWS		50.3	339.7	390.1	453.0%	**520.1%**
H18	Ponds near Manchester Airport Runway LWS		50.3	965.4	1015.7	1287.2%	**1,354.3%**
H19	Bentley & Tomfield Banks LWS		28.5	27.1	55.7	36.2%	74.2%
H20	Ponds at Davenport Green LWS		39.2	34.9	74.1	46.5%	98.7%
H21	Big Wood LWS		67.0	25.7	92.7	34.2%	**123.6%**
H22	Park Wood LWS		64.6	23.9	88.5	31.9%	**118.0%**
H23	Davenport Green Wood LWS		104.2	48.4	152.6	64.6%	**203.5%**
H24	Painswick Park Meadow LWS		86.4	74.6	161.0	99.5%	**214.7%**
H25	Rossmill LWS		59.4	27.3	86.7	36.4%	**115.6%**
H26	Heald Green Marsh LWS		30.5	20.2	50.7	27.0%	67.6%
H27	West Woodend Wood LWS		50.3	23.1	73.4	30.7%	97.9%
H28	Ecclesfield Wood LWS		19.8	21.8	41.6	29.0%	55.4%
H29	Wood Near Valley House LWS		21.7	29.4	51.0	39.1%	68.0%
H30	Styal Woods LWS		27.7	40.2	67.8	53.5%	90.4%
H31	East Woodend Wood LWS		20.1	18.6	38.7	24.8%	51.6%
H32	Mobberley Brook Wood LWS		15.9	11.2	27.2	15.0%	36.2%
H33	Round Covert LWS		19.8	19.1	38.9	25.4%	51.9%
H34	Jackson's Bank East LWS		26.7	24.0	50.7	32.0%	67.5%

Rec ref	Protected Conservation Area	EQS (µg/m^3)	Background concentration (µg/m^3)	PC (µg/m^3)	PEC (µg/m^3)	PC/EQS (%)	PEC/EQS (%)
H35	Wood End - Lady Lane LWS		20.1	928.9	949.0	1238.5%	1265.3%
H36	Fields Near Mobberley Brook LWS		16.7	12.2	28.9	16.3%	38.5%
H37	Town Lane Farm Sand Pit And Ponds LWS		16.9	9.9	26.8	13.2%	35.7%
H38	Raleigh Wood LWS		17.4	14.4	31.8	19.2%	42.4%
H39	Square Wood LWS		17.4	14.3	31.7	19.1%	42.3%
H40	Saltersley Hall Farm LWS		18.1	9.5	27.6	12.7%	36.8%
H41	Oversley Lodge LWS		92.2	43.9	136.1	58.6%	**181.5%**
H42	Burleyhurst Wood LWS		21.7	17.8	39.5	23.7%	52.6%
H43	Hooksbank Wood And Bollin Oxbows LWS		21.7	42.3	64.0	56.5%	85.4%
H44	Bollin Oxbow At Castle Hill LWS		50.3	28.7	79.1	38.3%	**105.4%**
H45	Lindow Moss & Newgate Nature Reserve LWS		18.8	18.5	37.3	24.7%	49.7%
H46	Mill Wood; Castle Mill LWS		21.1	25.7	46.8	34.3%	62.4%
H47	Lindow Moss & Morley Green Heath LWS		18.8	18.5	37.3	24.6%	49.7%
H48	Oversley Ford Brickworks And Road Embankment LWS		79.2	1,010.6	1,089.8	1,347.5%	**1,453.1%**
H49	Dobbin Brook Clough LWS		24.3	16.2	40.4	21.6%	53.9%
H50	Norcliffe Farm, Styal LWS		22.0	19.4	41.4	25.9%	55.2%
H51	Holly Bank Wood LWS		27.7	30.3	58.0	40.4%	77.3%
H52	Park Farm Grassland LWS		16.8	12.8	29.6	17.1%	39.5%
H53	Cotteril Clough AW		102.4	90.2	192.6	120.3%	**256.7%**

Bold denotes exceedance of the relevant EQS

The results in Table 5-3 indicate that at the assessed European designated sites (SACs and RAMSAR sites) and assessed local nature sites, the annual mean NOx and SO_2 PCs are less than 1% and 100%, respectively, of the relevant critical level and the effect is considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025). It is noted that exceedances of the annual mean NOx EQS are predicted to occur at 15 assessed local nature sites. However, these exceedances are a result of the existing background concentration applied in the study already exceeding or nearly exceeding the EQS. As discussed in Section 4, the background concentrations applied in the assessment include an element of double counting of emissions from the assessed combustion plant.

At Cotteril Clough SSSI (& AW, LWS) (i.e. H5), the annual mean NOx PC is above 1% (i.e. 3.8%) of the relevant critical level and the corresponding PEC exceeds this value. However, the background annual mean NOx concentration of 39.6 µg/m^3 (Defra, 2025b) already exceeds the annual mean NOx EQS (i.e. 30 µg/m^3), and will already include a contribution from the assessed combustion plant. The highest PC is predicted to occur at NGR E 380897 N 384218. Further analysis indicates that boiler A14, which is approximately 0.28 km southeast of this location, contributes approximately 49% of the annual mean NOx PC.

Further description of the habitat condition of Cotteril Clough SSSI is presented in Section 5.4.3.

For the maximum 24-hour mean critical level for NOx, the results indicate that at Manchester Mosses SAC (i.e. H2), the PC is less than 10% of the relevant critical level and the effect is considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

At Rixton Clay Pits SAC (i.e. H1), Rostherne Mere Ramsar (i.e. H3) and Midland Mere & Mosses - Phase 1 Ramsar (i.e. H4), the PCs are above 10% of the relevant critical level (i.e. 10.1%, 21.8% and 14.4%. respectively). However, the corresponding PECs (which may already include an element of double counting), equate to less than 61% of the EQS and the impact is considered 'not significant'.

At Cotteril Clough SSSI (& AW, LWS) (i.e. H5), the 24-hour mean NOx PC equates to 74.3% of the EQS and the corresponding PEC is predicted to exceed the critical level. It should be noted that the background NOx concentration applied (i.e. 79.2 µg/m^3) (Defra, 2025b) already exceeds the daily mean NOx critical level value (i.e. 75 µg/m^3). GEN04, which is approximately 0.62 km south-southwest of the location where the highest PC is predicted to occur (NGR E 380937 N 384378), contributes approximately 91% of the predicted daily mean NOx PC.

GEN04 operates primarily during routine testing / essential maintenance works and typically operates for less than 200 hours per year (reducing to approximately 12 hours per year from May 2025 onwards) (see Table 2-1). Therefore, it is extremely unlikely that GEN04 would operate for a prolonged period up to 24 hours and would coincide with all of the worst meteorological conditions each year. Therefore, the results presented are likely to be considerably higher than would reasonably be expected and based on professional judgement, the impact is considered to be 'not significant'.

At the majority of assessed local nature sites, the PCs are less than 100% of the daily mean NOx critical level and the effect is considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025). The corresponding PECs at some of these local nature sites are predicted to exceed the EQS as a result of the background concentration already exceeding or nearly exceeding the EQS.

At Ponds near Manchester Airport Runway LWS (i.e. H18), Wood End - Lady Lane LWS (i.e. H35) and Oversley Ford Brickworks And Road Embankment LWS (i.e. H48), which border / encroach the site fenceline, the respective daily mean NOx PCs exceed 900 µg/m^3. Further description is provided in Table 5-4.

Table 5-4. Maximum 24-hour mean critical level for NOx at assessed local nature sites H18, H35 and H48

Receptor ref	Protected conservation area	PC (µg/m^3)	Location where maximum PC is predicted	Comment
H18	Ponds near Manchester Airport Runway LWS	965.4	E 380817 N 383798	This location is at the site fenceline, approximately 40 m northeast of the GEN04 stack
H35	Wood End - Lady Lane LWS	928.9	E 380237 N 382158	This location is at the site fenceline, approximately 30 m east-northeast of the GEN21 stack
H48	Oversley Ford Brickworks And Road Embankment LWS	1,010.6	E 381417 N 383098	This location is at the site fenceline, approximately 38 m south-southwest of the GEN24 stack

The PCs predicted at these protected conservation areas are dominated by emissions from the nearby standby generators; GEN04, GEN21 and GEN24. These standby generators operate primarily during routine testing / essential maintenance works and typically operate for less than 200 hours per year (reducing to approximately 12 hours per year from May 2025 onwards) (see Table 2-1). It is extremely unlikely that they would operate for a prolonged period up to 24 hours and would coincide with all of the worst meteorological conditions each year. Furthermore, in the absence of emissions data, a NOx emission concentration of 750 mg/Nm^3 has been applied for all assessed standby generators, which is derived from the Environment Agency's guidance level (Environment Agency, 2023). In practice, based on the thermal input capacity of the standby generators, the NOx emission concentrations are likely to be considerably lower.

As discussed in Section 2.1, in order to predict short-term modelled concentrations, it is assumed the assessed combustion plant operate continuously (i.e. 8,760 hours per year) as this approach ensures that the worst-case or maximum short-term modelled concentrations are quantified.

Therefore, the results presented are likely to be considerably higher than would reasonably be expected and based on professional judgement, the impact is considered to be 'not significant'.

Summary

The assessment against critical levels indicates that at some of the assessed protected conservation areas, PCs are elevated and exceedances of the relevant EQS are predicted to occur. However, for the majority of these ecological receptors, the exceedances are as a result of the background concentration applied in the study and not as a direct result of contributions from the assessed MCP. Furthermore, the assumed continuous operation of the assessed combustion plant, particularly the standby generators, means the results presented for daily mean NOx concentrations are likely to be considerably higher than would reasonably be expected.

When taking into account the conservative approach adopted throughout this assessment, the impact at the assessed protected conservation areas is considered 'not significant'.

5.4.2 Assessment against Critical Loads

The rate of deposition of acidic compounds and nitrogen containing species have been estimated at the assessed protected conservation areas. This allows the potential for adverse effects to be evaluated by comparison with critical loads for acid and nutrient nitrogen deposition. The assessment took account of emissions of NOx and SO_2 only.

Critical load functions for acid deposition are specified on the basis of both nitrogen-derived acid and sulphur-derived acid. This information, including existing deposition levels at habitat sites, is available from APIS (Centre for Ecology and Hydrology, 2025). Further information on the assessment of deposition is provided in Appendix B. The full detailed modelled results are displayed in Table 5-5 and Table 5-6.

Table 5-5: Modelled acid deposition at assessed protected conservation areas

Ref	Habitat	Vegetation type (for deposition velocity)	Critical load (CL) (kEqH+/ha/year)			Existing acid deposition (kEqH+/ha/year)		PC (kEqH+/ha/year)	PEC (kEqH+/ha/year)	PC/CL (%)	PEC/CL (%)
			CLMaxS	CLMinN	CLMaxN	(N)	(S)				
H1	Rixton Clay Pits SAC	Short	0.880	0.438	1.318	1.34	0.21	0.000	1.55	<0.1%	118%
H2	Manchester Mosses SAC	Short	0.243	0.321	0.564	1.31	0.23	0.000	1.54	0.1%	273%
H3	Rostherne Mere Ramsar	Short	This habitat is not sensitive to acidity			1.44	0.19	0.001	1.63	-	-
H4	Midland Mere & Mosses - Phase 1 Ramsar	Short	This habitat is not sensitive to acidity			1.52	0.18	0.000	1.70	-	-
H5	Cotteril Clough SSSI & AW & LWS	Tall	1.611	0.357	1.968	2.40	0.27	0.017	2.69	0.8%	137%
H6	Oversley Farm Wood (ID 1104307) AW & LWS	Tall	1.611	0.357	1.968	2.40	0.27	0.004	2.67	0.2%	136%
H7	Ancient woodland (ID 1417980)	Tall	1.144	0.357	1.501	2.41	0.27	0.003	2.68	0.2%	179%
H8	Ancient woodland (ID 1417975)	Tall	1.144	0.357	1.501	2.41	0.27	0.001	2.68	0.1%	179%
H9	Sunbank Wood (ID 1105635) AW & LWS	Tall	1.611	0.357	1.968	2.41	0.26	0.009	2.68	0.5%	136%
H10	Warburton Wood (ID 1105631) AW	Tall	1.541	0.357	1.898	2.43	0.26	0.005	2.70	0.3%	142%
H11	Hennersley Bank (ID 1505490) AW	Tall	1.541	0.357	1.898	2.43	0.26	0.006	2.70	0.3%	142%
H12	Bently/Tomfield Banks (ID 1105630) AW	Tall	1.558	0.357	1.915	2.44	0.25	0.004	2.69	0.2%	141%
H13	Ancient woodland (ID 1417983) AW & LWS	Tall	1.542	0.357	1.899	2.43	0.25	0.004	2.68	0.2%	141%
H14	Davenport Green Wood (ID 1505436)	Tall	1.574	0.357	1.931	2.39	0.26	0.011	2.66	0.6%	138%
H15	Bollin Bank (ID 1505489) AW & LWS	Tall	1.541	0.357	1.898	2.43	0.26	0.006	2.70	0.3%	142%
H16	Well and Double Woods LWS	Short	0.900	0.438	1.338	1.37	0.21	0.003	1.58	0.2%	118%
H17	Road Cutting at Castle Hill LWS	Tall	1.611	0.357	1.968	2.42	0.26	0.030	2.71	1.5%	138%
H18	Ponds near Manchester Airport Runway LWS	Short	0.900	0.438	1.338	1.37	0.21	0.101	1.68	7.6%	126%
H19	Bentley & Tomfield Banks LWS	Tall	1.557	0.357	1.914	2.42	0.26	0.005	2.68	0.2%	140%
H20	Ponds at Davenport Green LWS	Tall	1.576	0.357	1.933	2.38	0.26	0.008	2.65	0.4%	137%
H21	Big Wood LWS	Tall	1.574	0.357	1.931	2.32	0.27	0.006	2.60	0.3%	134%

Ref	Habitat	Vegetation type (for deposition velocity)	Critical load (CL) (kEqH+/ha/year)			Existing acid deposition (kEqH+/ha/year)		PC (kEqH+/ha/year)	PEC (kEqH+/ha/year)	PC/CL (%)	PEC/CL (%)
			CLMaxS	CLMinN	CLMaxN	(N)	(S)				
H22	Park Wood LWS	Tall	1.573	0.357	1.930	2.31	0.27	0.006	2.59	0.3%	134%
H23	Davenport Green Wood LWS	Tall	1.574	0.357	1.931	2.39	0.26	0.011	2.66	0.6%	138%
H24	Painswick Park Meadow LWS	Tall	1.575	0.357	1.932	2.36	0.27	0.037	2.67	1.9%	138%
H25	Rossmill LWS	Tall	1.541	0.357	1.898	2.43	0.26	0.005	2.70	0.3%	142%
H26	Heald Green Marsh LWS	Short	0.890	0.438	1.328	1.31	0.21	0.002	1.52	0.1%	115%
H27	West Woodend Wood LWS	Tall	1.611	0.357	1.968	2.42	0.26	0.004	2.68	0.2%	136%
H28	Ecclesfield Wood LWS	Tall	1.543	0.357	1.900	2.45	0.25	0.003	2.70	0.2%	142%
H29	Wood Near Valley House LWS	Tall	1.144	0.357	1.501	2.41	0.27	0.003	2.68	0.2%	179%
H30	Styal Woods LWS	Short	1.650	0.438	2.088	1.36	0.26	0.002	1.62	0.1%	77%
H31	East Woodend Wood LWS	Tall	1.611	0.357	1.968	2.43	0.26	0.003	2.69	0.2%	137%
H32	Mobberley Brook Wood LWS	Tall	1.542	0.357	1.899	2.58	0.24	0.000	2.82	<0.1%	149%
H33	Round Covert LWS	Tall	1.543	0.357	1.900	2.45	0.25	0.003	2.70	0.1%	142%
H34	Jackson's Bank East LWS	Tall	1.074	0.357	1.431	2.45	0.25	0.004	2.70	0.3%	189%
H35	Wood End - Lady Lane LWS	Tall	1.611	0.357	1.968	2.43	0.26	0.139	2.83	7.1%	144%
H36	Fields Near Mobberley Brook LWS	Short	0.890	0.438	1.328	1.45	0.19	0.000	1.64	0.0%	124%
H37	Town Lane Farm Sand Pit And Ponds LWS	Short	0.880	0.438	1.318	1.48	0.18	0.000	1.66	0.0%	126%
H38	Raleigh Wood LWS	Tall	1.542	0.357	1.899	2.54	0.23	0.001	2.77	0.1%	146%
H39	Square Wood LWS	Tall	1.542	0.357	1.899	2.54	0.23	0.001	2.77	0.1%	146%
H40	Saltersley Hall Farm LWS	Short	0.900	0.438	1.338	1.39	0.20	0.000	1.59	<0.1%	119%
H41	Oversley Lodge LWS	Short	0.900	0.438	1.338	1.35	0.22	0.003	1.57	0.2%	118%
H42	Burleyhurst Wood LWS	Tall	1.144	0.357	1.501	2.41	0.27	0.001	2.68	0.1%	179%
H43	Hooksbank Wood And Bollin Oxbows LWS	Short	0.500	0.438	0.938	1.37	0.21	0.002	1.58	0.2%	169%
H44	Bollin Oxbow At Castle Hill LWS	Tall	1.611	0.357	1.968	2.42	0.26	0.005	2.69	0.3%	136%
H45	Lindow Moss & Newgate Nature Reserve LWS	Short	0.258	0.366	0.624	1.38	0.21	0.001	1.59	0.1%	255%

Ref	Habitat	Vegetation type (for deposition velocity)	Critical load (CL) (kEqH+/ha/year)			Existing acid deposition (kEqH+/ha/year)		PC (kEqH+/ha/year)	PEC (kEqH+/ha/year)	PC/CL (%)	PEC/CL (%)
			CLMaxS	CLMinN	CLMaxN	(N)	(S)				
H46	Mill Wood; Castle Mill LWS	Tall	1.542	0.357	1.899	2.43	0.25	0.005	2.69	0.3%	141%
H47	Lindow Moss & Morley Green Heath LWS	Tall	0.318	0.285	0.603	2.42	0.26	0.001	2.68	0.2%	445%
H48	Oversley Ford Brickworks And Road Embankment LWS	Tall	1.611	0.357	1.968	2.40	0.27	0.188	2.86	9.6%	145%
H49	Dobbin Brook Clough LWS	Tall	1.681	0.357	2.038	2.29	0.25	0.003	2.54	0.1%	125%
H50	Norcliffe Farm, Styal LWS	Tall	1.611	0.357	1.968	2.36	0.26	0.002	2.62	0.1%	133%
H51	Holly Bank Wood LWS	Tall	2.728	0.357	3.085	2.38	0.27	0.003	2.65	0.1%	86%
H52	Park Farm Grassland LWS	Short	0.900	0.438	1.338	1.42	0.19	0.000	1.61	<0.1%	120%
H53	Cotteril Clough AW	Tall	1.611	0.357	1.968	2.39	0.27	0.023	2.68	1.2%	136%

Table 5-6: Modelled nitrogen deposition at assessed protected conservation area

Ref	Habitat	Vegetation type (for deposition velocity)	Minimal Critical Load (CL)	Existing nutrient deposition (kgN/ha-year)				
				Existing deposition	PC	PEC	PC/CL (%)	PEC/CL(%)
H1	Rixton Clay Pits SAC	Short	5	18.78	0.005	18.79	0.1%	376%
H2	Manchester Mosses SAC	Short	5	18.30	0.005	18.30	0.1%	366%
H3	Rostherne Mere Ramsar	Short	5	20.17	0.012	20.18	0.2%	404%
H4	Midland Mere & Mosses - Phase 1 Ramsar	Short	5	21.30	0.007	21.31	0.1%	426%
H5	Cotteril Clough SSSI & AW & LWS	Tall	15	33.50	0.232	33.73	1.5%	225%
H6	Oversley Farm Wood (ID 1104307) AW & LWS	Tall	10	33.55	0.055	33.60	0.5%	336%
H7	Ancient woodland (ID 1417980)	Tall	10	33.71	0.036	33.75	0.4%	337%
H8	Ancient woodland (ID 1417975)	Tall	10	33.71	0.021	33.73	0.2%	337%
H9	Sunbank Wood (ID 1105635) AW & LWS	Tall	10	33.67	0.133	33.80	1.3%	338%
H10	Warburton Wood (ID 1105631) AW	Tall	10	33.95	0.072	34.02	0.7%	340%
H11	Hennersley Bank (ID 1505490) AW	Tall	10	33.95	0.081	34.03	0.8%	340%
H12	Bently/Tomfield Banks (ID 1105630) AW	Tall	10	34.12	0.057	34.18	0.6%	342%
H13	Ancient woodland (ID 1417983) AW & LWS	Tall	10	34.08	0.053	34.13	0.5%	341%
H14	Davenport Green Wood (ID 1505436)	Tall	10	33.53	0.152	33.68	1.5%	337%
H15	Bollin Bank (ID 1505489) AW & LWS	Tall	10	33.95	0.085	34.03	0.8%	340%
H16	Well and Double Woods LWS	Short	5	19.24	0.040	19.28	0.8%	386%
H17	Road Cutting at Castle Hill LWS	Tall	10	33.81	0.409	34.22	4.1%	342%
H18	Ponds near Manchester Airport Runway LWS	Short	5	19.24	1.398	20.64	28.0%	413%
H19	Bentley & Tomfield Banks LWS	Tall	10	33.82	0.063	33.88	0.6%	339%
H20	Ponds at Davenport Green LWS	Tall	10	33.38	0.116	33.50	1.2%	335%
H21	Big Wood LWS	Tall	10	32.43	0.086	32.52	0.9%	325%
H22	Park Wood LWS	Tall	10	32.28	0.087	32.37	0.9%	324%
H23	Davenport Green Wood LWS	Tall	10	33.53	0.150	33.68	1.5%	337%
H24	Painswick Park Meadow LWS	Tall	10	33.07	0.514	33.58	5.1%	336%

Ref	Habitat	Vegetation type (for deposition velocity)	Minimal Critical Load (CL)	Existing nutrient deposition (kgN/ha-year)				
				Existing deposition	PC	PEC	PC/CL (%)	PEC/CL(%)
H25	Rossmill LWS	Tall	10	33.95	0.074	34.02	0.7%	340%
H26	Heald Green Marsh LWS	Short	5	18.33	0.023	18.35	0.5%	367%
H27	West Woodend Wood LWSs	Tall	10	33.81	0.057	33.87	0.6%	339%
H28	Ecclesfield Wood LWS	Tall	10	34.34	0.040	34.38	0.4%	344%
H29	Wood Near Valley House LWS	Tall	10	33.71	0.043	33.75	0.4%	338%
H30	Styal Woods LWS	Short	5	18.97	0.034	19.00	0.7%	380%
H31	East Woodend Wood LWS	Tall	10	33.96	0.045	34.01	0.5%	340%
H32	Mobberley Brook Wood LWS	Tall	10	36.16	0.007	36.17	0.1%	362%
H33	Round Covert LWS	Tall	10	34.34	0.039	34.38	0.4%	344%
H34	Jackson's Bank East LWS	Tall	10	34.23	0.055	34.28	0.5%	343%
H35	Wood End - Lady Lane LWS	Tall	10	33.96	1.928	35.89	19.3%	359%
H36	Fields Near Mobberley Brook LWS	Short	5	20.35	0.005	20.36	0.1%	407%
H37	Town Lane Farm Sand Pit And Ponds LWS	Short	5	20.77	0.004	20.77	0.1%	415%
H38	Raleigh Wood LWS	Tall	10	35.51	0.020	35.53	0.2%	355%
H39	Square Wood LWS	Tall	10	35.51	0.019	35.53	0.2%	355%
H40	Saltersley Hall Farm LWS	Short	5	19.44	0.006	19.45	0.1%	389%
H41	Oversley Lodge LWS	Short	5	18.89	0.046	18.94	0.9%	379%
H42	Burleyhurst Wood LWS	Tall	10	33.71	0.021	33.73	0.2%	337%
H43	Hooksbank Wood And Bollin Oxbows LWS	Short	5	19.17	0.031	19.20	0.6%	384%
H44	Bollin Oxbow At Castle Hill LWS	Tall	10	33.81	0.076	33.89	0.8%	339%
H45	Lindow Moss & Newgate Nature Reserve LWS	Short	5	19.28	0.008	19.29	0.2%	386%
H46	Mill Wood; Castle Mill LWS	Tall	10	34.08	0.075	34.15	0.7%	342%
H47	Lindow Moss & Morley Green Heath LWS	Tall	10	33.88	0.015	33.90	0.2%	339%
H48	Oversley Ford Brickworks And Road Embankment LWS	Tall	10	33.55	2.617	36.17	26.2%	362%

Ref	Habitat	Vegetation type (for deposition velocity)	Minimal Critical Load (CL)	Existing nutrient deposition (kgN/ha-year)				
				Existing deposition	PC	PEC	PC/CL (%)	PEC/CL(%)
H49	Dobbin Brook Clough LWS	Tall	10	32.02	0.039	32.06	0.4%	321%
H50	Norcliffe Farm, Styal LWS	Tall	10	33.01	0.026	33.04	0.3%	330%
H51	Holly Bank Wood LWS	Tall	10	33.29	0.046	33.34	0.5%	333%
H52	Park Farm Grassland LWS	Short	5	19.93	0.005	19.93	0.1%	399%
H53	Cotteril Clough AW	Tall	10	33.39	0.320	33.71	3.2%	337%

The results in Table 5-5 and Table 5-6 indicate that with the exception Cotteril Clough SSSI (& AW, LWS) (i.e. H5), the PCs at the assessed European designated sites and local nature sites are less than 1% and 100%, respectively, of the relevant critical load value for acid and nutrient nitrogen deposition and the impact can be described as 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

At Cotteril Clough SSSI (& AW, LWS) (i.e. H5), the PC for acid deposition is less than 1% of the relevant critical load value and the impact can be described as 'insignificant' as per Environment Agency guidance (Environment Agency, 2025). However, for nutrient nitrogen deposition, the PC is just above 1% (i.e. 1.5%) of the relevant critical load value.

Further description of the habitat condition of Cotteril Clough SSSI is presented in Section 5.4.3

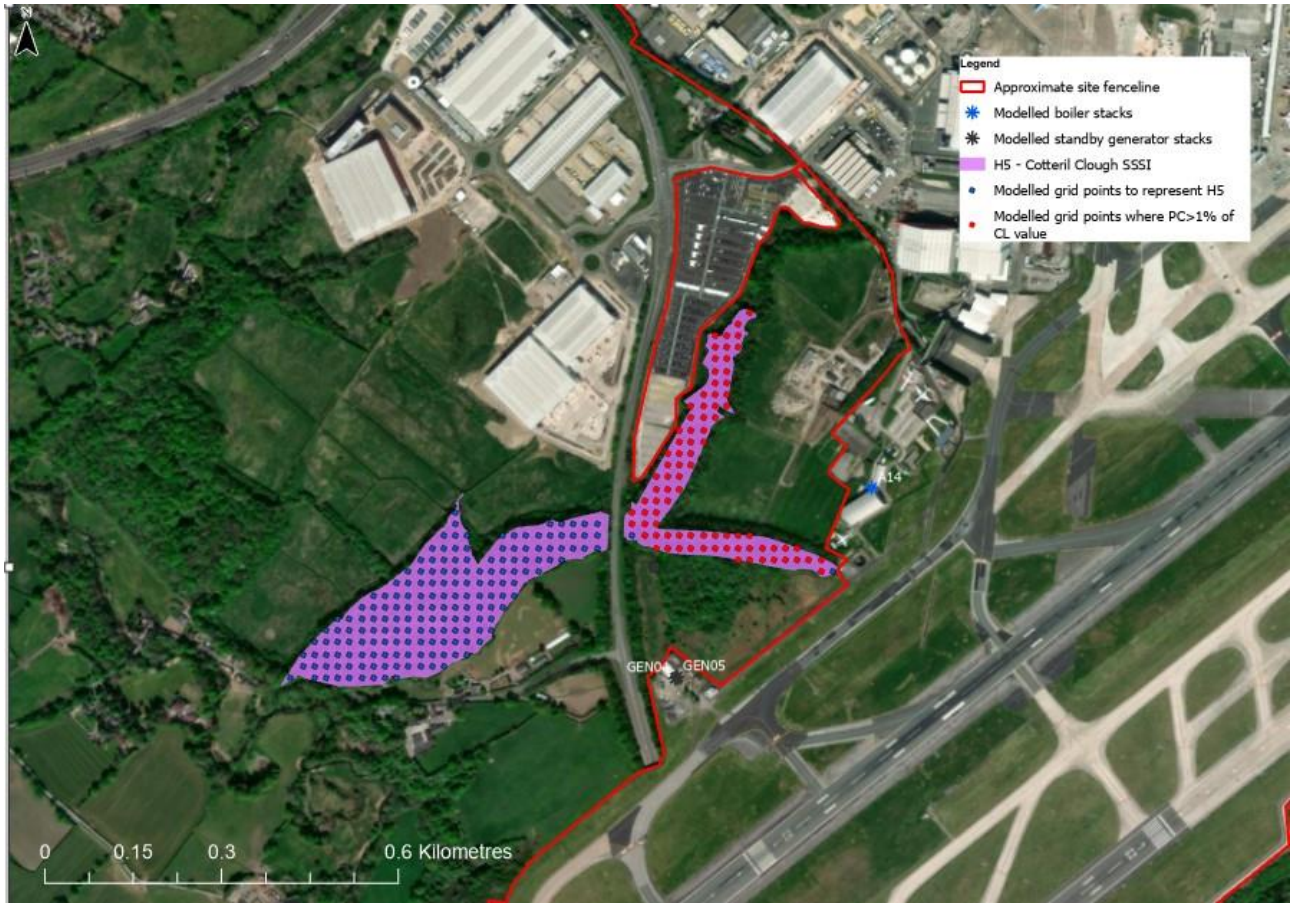
It should be noted acid and nitrogen deposition rates currently exceed their relevant critical loads at the majority of assessed protected conservation areas. However, this is a relatively common situation at protected conservation areas across the UK due to the high baseline deposition rates.

5.4.3 Review of Cotteril Clough SSSI

Cotteril Clough SSSI is located adjacent to runway 05L / 23R and is comprised primarily of birch-oak and alder woodland (Natural England, 2025).

As described on Section 5.4.2, for nutrient nitrogen deposition the PC is just above 1% (i.e. 1.5%) of the relevant critical load value. Further analysis indicates that of the 259 modelled grid points to represent Cotteril Clough SSSI, the PC is predicted to be greater than 1% of the critical load value at 83 grid point locations (or 32% of the assessed area) (see Figure 5-1).

Figure 5-1. Area of Cotteril Clough SSSI where PCs are greater than 1% of the critical load value for nutrient nitrogen deposition (ArcGIS Pro 3.1.2)



Analysis of the individual site units and interest features at Cotteril Clough SSSI, and its relative sensitivity to nutrient nitrogen and acid deposition, has been carried out. The Cotteril Clough SSSI site units (see

Figure 5-2) are denoted by the main habitat type[8] present. The Cotteril Clough SSSI unit condition assessment is presented in Table 5-7.

Figure 5-2. Cotteril Clough SSSI site units (Natural England, 2025)

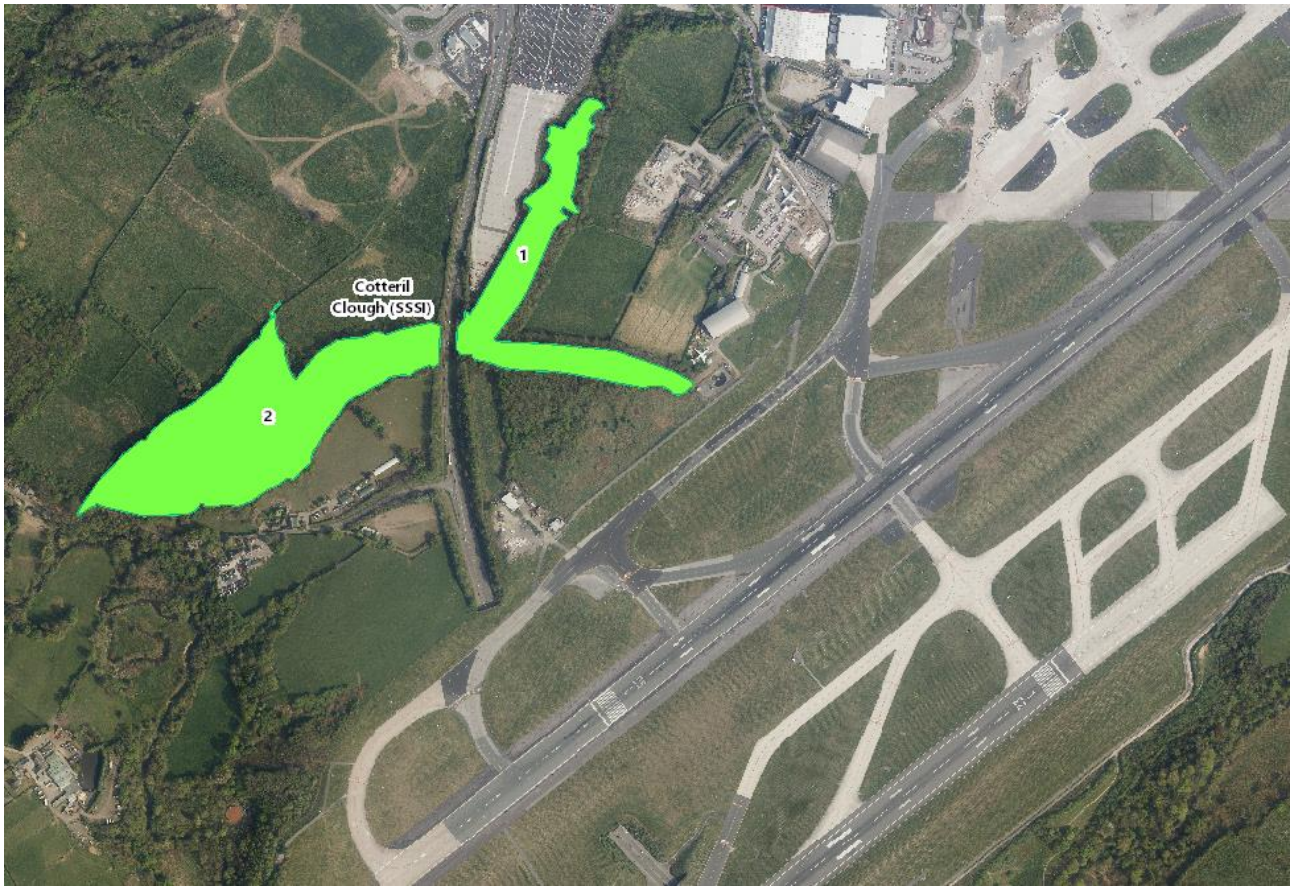


Table 5-7. Cotteril Clough SSSI unit condition assessment (Natural England, 2025)

Unit number	Main habitat	Assessment description	Comment
001	Broadleaved, Mixed And Yew Woodland - Lowland	Favourable	There is a Low risk of plant disease occurring at the SSSI
002	Broadleaved, Mixed And Yew Woodland - Lowland	Favourable	

Table 5-7 indicates that the main habitat type at Unit 001 and 002 is described as being '*Broadleaved, Mixed And Yew Woodland - Lowland*' and has been declared '*Favourable*'[9]. This means that the designated feature(s) within a unit/site are being adequately conserved and the results from monitoring demonstrate that the feature(s) in the unit/site are meeting all the mandatory site specific monitoring targets set out in the monitoring specification. It is important to note these units have been assigned a '*Favourable*' condition even with the historical operation of the assessed combustion plant at Manchester Airport.

Based on the conservative approach adopted throughout this assessment and habitat condition (even with the historical operation of the airport), the impact at Cotteril Clough SSSI is considered 'not significant'.

5.5 Sensitivity Analysis

A sensitivity study was undertaken to see how changes to the surface roughness and omission of the buildings in the 2022 model (which predicted the highest annual mean concentrations at sensitive off-site human receptor locations) and 2021 model (which predicted the highest 1-hour mean NO_2 concentrations at sensitive off-site human receptor locations) may impact on predicted concentrations. The results of the sensitivity analysis are presented in Table 5-8 to Table 5-10.

8 The main habitat type is selected from a list of habitats given by the UK Biodiversity Broad Habitat classification, which sets the framework for commonly defining habitat types across the whole of the UK.

9 A unit can only be considered favourable when all the component designated features are favourable.

Table 5-8: Sensitivity analysis - fixed surface roughness of 0.1 m

Pollutant	Averaging period	Assessment location	Original PC (surface roughness 0.5 m) (µg/m³)	Surface roughness length 0.1 m				
				PC (µg/m³)	PEC (µg/m³)	PC/EQS	PEC/EQS	% difference in PC/EQS compared to original
NO_2	Annual mean	Sensitive off-site locations	2.0	2.2	18.0	5.6%	45.0%	0.6%
	1 hour mean (99.79th percentile)	Sensitive off-site locations	71.1	139.7	175.8	69.9%	87.9%	34.3%

The results in Table 5-8 indicate that the change to maximum predicted annual mean concentrations for NO_2 is negligible when using a surface roughness value of 0.1 m compared to the original value of 0.5 m. For 1-hour mean (99.79th percentile) NO_2 concentrations, the PC is considerably higher. However, a surface roughness of 0.1 m (representing root crops) is not considered representative of the site and surrounding area.

Table 5-9: Sensitivity analysis - fixed surface roughness of 1 m

Pollutant	Averaging period	Assessment location	Original PC (surface roughness 0.5 m) (µg/m³)	Surface roughness length 1 m				
				PC (µg/m³)	PEC (µg/m³)	PC/EQS	PEC/EQS	% difference in PC/EQS compared to original
NO_2	Annual mean	Sensitive off-site locations	2.0	1.9	17.6	4.7%	44.1%	-0.3%
	1 hour mean (99.79th percentile)	Sensitive off-site locations	71.1	55.9	80.4	28.0%	40.2%	-7.6%

The results in Table 5-9 indicate that the change to maximum predicted annual mean concentrations for NO_2 is negligible when using a surface roughness value of 1 m compared to the original value of 0.5 m. For 1-hour mean (99.79th percentile) NO_2 concentrations, the PC is lower when modelling with an increased surface roughness value of 1 m. However, a surface roughness of 1 m (representing a large city centre location with built-up areas and tall buildings) is not considered representative of the site and surrounding area.

Table 5-10: Sensitivity analysis - no buildings

Pollutant	Averaging period	Assessment location	Original PC (buildings included) (µg/m³)	Buildings omitted				
				PC (µg/m³)	PEC (µg/m³)	PC/EQS	PEC/EQS	% difference in PC/EQS compared to original
NO_2	Annual mean	Sensitive off-site locations	2.0	1.5	17.3	3.9%	43.2%	-1.1%
	1 hour mean	Sensitive off-site locations	71.1	66.7	91.2	33.4%	45.6%	-2.2%

Pollutant	Averaging period	Assessment location	Original PC (buildings included) (µg/m^3)	Buildings omitted				
				PC (µg/m^3)	PEC (µg/m^3)	PC/EQS	PEC/EQS	% difference in PC/EQS compared to original
	(99.79th percentile)							

The results in Table 5-10 indicate that the differences between the maximum predicted concentrations with and without the buildings is such that including buildings within the model is the preferred option for this study, to maintain a more realistic, and conservative, approach.

6. Conclusions

This report has assessed the potential air quality impacts associated with the operation of the existing natural gas fired boilers and diesel fuelled standby generators at Manchester Airport. The predicted impacts were assessed against the relevant air quality standards and guidelines for the protection of human health and protected conservation areas (referred to as critical levels and critical loads).

6.1 Human Receptors

Off-site sensitive human receptor locations

The results indicate that for annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations, the respective PCs are either less than 1% of the relevant long-term EQS or where the PCs are above 1% of the relevant EQS, the PEC is less than 70% of the relevant EQS and the impacts are considered 'not significant' as per Environment Agency guidance (Environment Agency, 2025).

For short-term NO_2, CO, SO_2 and particulate concentrations, the PCs are either less than 10% of the relevant EQS or where the PCs are above 10% of the relevant EQS, the respective PEC is less than 70% of the relevant EQS and the impacts are considered 'not significant'.

Off-site modelled locations

For short-term CO and SO_2 concentrations, the PCs are less than 10% of the relevant EQS and the impacts are considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

For 1-hour mean (99.79th percentile) NO_2 concentrations, the PC is high and the corresponding PEC exceeds the relevant EQS. The highest PC is predicted to occur at the southern fenceline of the site approximately 40 m east-southeast of GEN24. Although just beyond the site fenceline, this location is not accessible to members of the public. Further analysis indicates that the none of the off-site locations where an exceedance of the short-term NO_2 EQS is predicted (i.e. adjacent to GEN04 / GEN05, GEN 15, GEN21 / GEN 22, GEN24 / GEN 25), are accessible to members of the public.

For those locations that are accessible to members of the public, the highest concentration is predicted to occur on Woodend Lane adjacent to the southern boundary of the site. As there are no footpaths along this lane, it is reasonable to assume that a member of the public would not be exposed for an hour or more at this location

Greater Manchester Combined Authority AQMA

The results indicate that for annual mean NO_2 and 24-hour mean (90.41st percentile) PM_{10} concentrations, the respective PCs are less than 16% of the relevant EQS. The highest PCs are predicted to occur in hedgerow between GEN15 and the M56 motorway in an area not accessible to members of the public. It should be noted there are no residential properties in the vicinity of this location. For those locations that are accessible to members of the public, the highest concentrations are predicted to occur on footpaths along Outwood Lane.

Based on the findings of the assessment and when considering the conservative approach adopted throughout this assessment, the overall impact is considered 'not significant' for sensitive off-site human receptor locations.

On-site sensitive human receptor locations

For short-term CO and SO_2 concentrations, although there is no requirement to compare, the PCs are less than 10% of the relevant EQS and the impacts are considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

For 1-hour mean NO_2 (99.79th percentile) concentrations, the PCs are elevated and the corresponding PEC exceeds the relevant standard. The highest PC is predicted to occur at R52, which represents a parking space on the upper floor of the T2 West multi-storey car park, adjacent to the A24 boiler stacks. As this receptor represents an airport parking space, it is reasonable to assume that a member of the public would not be exposed for an hour or more at this location.

6.2 Protected Conservation Areas

For critical levels and critical loads, the results indicate that at the assessed European designated sites and assessed local nature sites, the PCs are less than 1% and 100%, respectively, of the relevant critical level / load and the effect is considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025).

At Cotteril Clough SSSI (& AW, LWS), the annual mean NOx PC is above 1% (i.e. 3.6%) of the relevant critical level and the corresponding PEC exceeds this critical level value. For critical loads, the PC for nutrient nitrogen deposition is just above 1% (i.e. 1.5%) of the relevant critical load value. Further analysis of Cotteril Clough SSSI indicates that the main habitat type at Unit 001 and 002 has been declared '*Favourable*', even with the historical operation of the assessed combustion plant at Manchester Airport.

The conservative approach adopted throughout this assessment means the results presented are likely to be higher than would reasonably be expected. Therefore, the impact at Cotteril Clough SSSI is considered 'not significant'.

For the maximum 24-hour mean critical level for NOx, the results indicate that at Manchester Mosses SAC (i.e. H2), the PC is less than 10% of the relevant critical level and the effect is considered 'insignificant' as per Environment Agency guidance (Environment Agency, 2025). At Rixton Clay Pits SAC (i.e. H1), Rostherne Mere Ramsar (i.e. H3) and Midland Mere & Mosses - Phase 1 Ramsar (i.e. H4), the PCs are above 10% of the relevant critical level (i.e. 10.1%, 15% and 10.2%. respectively). However, the corresponding PECs equate to less than 61% of the EQS and the impact is considered 'not significant'.

At Cotteril Clough SSSI (& AW, LWS) (i.e. H5), the 24-hour mean NOx PC is elevated and equates to 74.3% of the EQS and the corresponding PEC is predicted to exceed the critical level value.

Further analysis indicates that GEN04, which is approximately 0.62 km south-southwest of this location, contributes approximately 91% of the predicted PC. GEN04 primarily operates during routine testing / essential maintenance works and typically operates for less than 200 hours per year (reducing to approximately 12 hours per year from May 2025 onwards). It is extremely unlikely that it would operate for a prolonged period up to 24 hours and would coincide with all of the worst meteorological conditions each year.

At Ponds near Manchester Airport Runway LWS (i.e. H18), Wood End - Lady Lane LWS (i.e. H35) and Oversley Ford Brickworks And Road Embankment LWS (i.e. H48), the respective daily mean NOx PCs exceed 900 µg/m^3. The PCs predicted at these protected conservation areas are dominated by emissions from GEN04, GEN21 and GEN24, respectively. These standby generators operate primarily during routine testing / essential maintenance works and typically operate for less than 200 hours per year (reducing to approximately 12 hours per year from May 2025 onwards). It is extremely unlikely that they would operate for a prolonged period up to 24 hours and would coincide with all of the worst meteorological conditions each year.

The conservative assumptions adopted throughout this assessment means the results presented are likely to be considerably higher than would reasonably be expected and based on professional judgement, the impact is considered to be 'not significant'.

6.3 Summary

Based on the above assessment, it is concluded that the operation of the assessed combustion plant at Manchester Airport are acceptable from an air quality perspective.

7. References

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8. Figures

N

Legend

- Approximate MAG ownership boundary
- Approximate site fenceline
- Modelled standby generator stacks
- Modelled boiler stacks
- Modelled buildings

GEN15 GEN29 GEN32 GEN28 A24 GEN31 A13 GEN14 A07 A11 A02 A17 A05 GEN17 & GEN18 A08 A01 GEN11 A18 GEN19 GEN30 GEN09 A20 GEN06, GEN07, GEN08 A09 GEN02 A14 GEN04 & GEN05 GEN24 & GEN25 GEN21 & GEN22

Davenport Green, Woodhouse Park, Hale Barns, Warburton Green, Ashley, Styal, Morley, Pownall Park, New Mills, Mobberley, Wilmslow, Knutsford, Altrincham, Hale, Gatley

Manchester Airport, Timperley Brook, Cotterill Clough Brook, River Bollin, Sugar Brook

Robinswood Road, Peel Hall, Little Wood, Comishway, Heald Green, Shadowmoss, Styal Road, Moss La, Holly La, Hollin Lane, Altrincham Rd, Mobberley Rd, Altrincham Road, Newgate, Burleyhurst La, Davenport La, Hobcroft La, Smith La, Back La, Castle Mill La, Cow La, Shay La, Bankhall La, Hale Road, Chapel La

A538, A555, M56, B5162, B5166, A34

Humphreys Wood, Flaxhigh Covert, Sunbank Wood, Mill Wood, Ecclesfield Wood, Brickhill Wood, Well Wood, Round Covert, Hooksbank Wood, Burleyhurst Wood, Worms Hill, Deadman's Clough, Willow Ground Wood, Burned Hey Wood, River Dean, Carr Wood, Lindow Moss, Rossmere, Black Lake

J6

0 0.5 1 2 Kilometres

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	27/05/2025	Initial Issue	DH	GW	GW	KS

Jacobs

Client: MAG Manchester Airport

Project: ENVIRONMENTAL PERMIT APPLICATION - MANCHESTER AIRPORT AIR QUALITY IMPACT ASSESSMENT

Drawing Title: APPROXIMATE MAG OWNERSHIP BOUNDARY & SITE FENCELINE, MODELLED STACK LOCATIONS AND MODELLED BUILDINGS

Drawing Status: FINAL

Scale @ A3	1:23,000	DO NOT SCALE
Jacobs No.	MAG42059	Rev 0
Client No.		

Drawing Number: FIGURE 1

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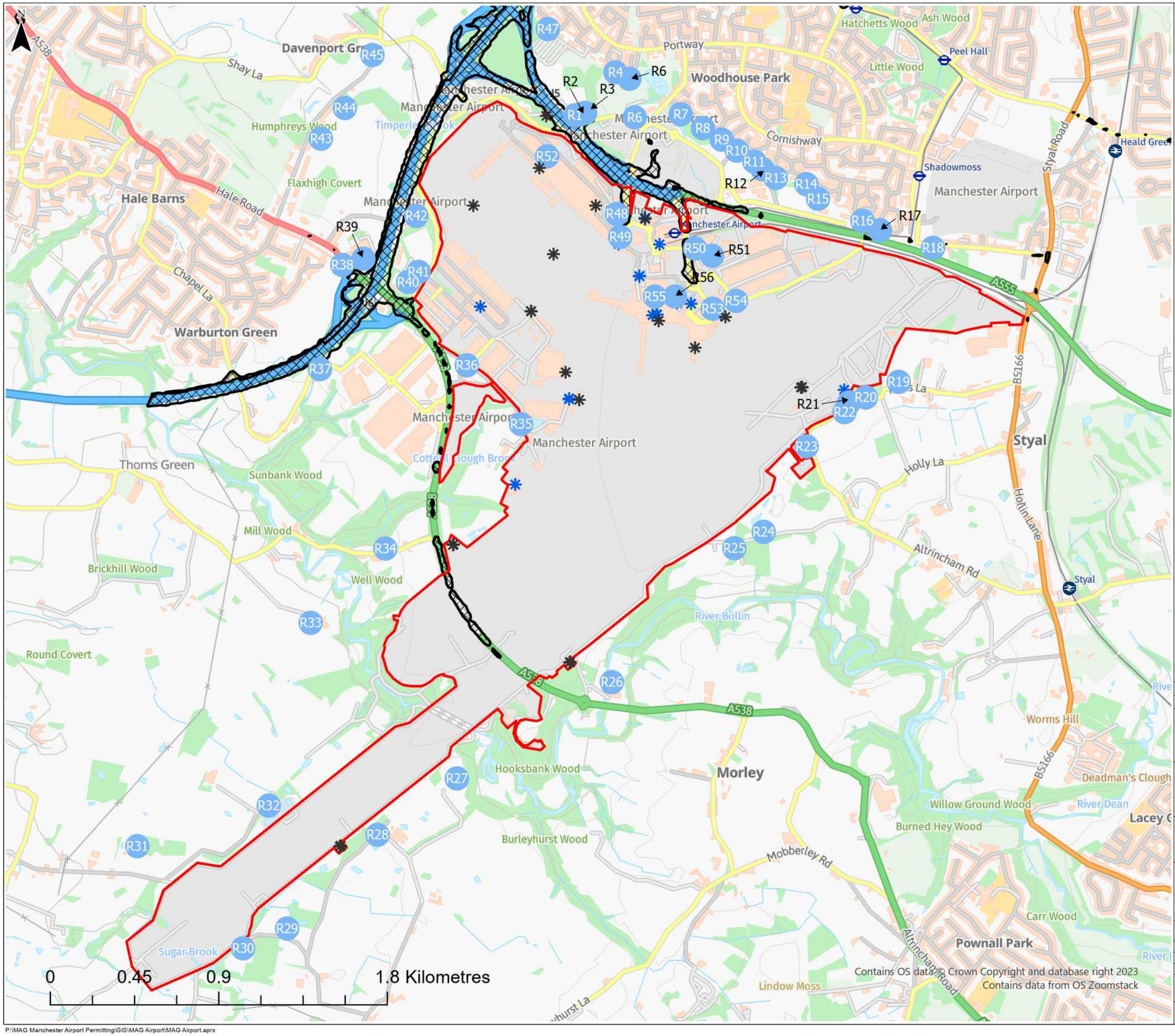

Legend

- Approximate site fenceline
- Modelled standby generator stacks
- Modelled boiler stacks
- Greater Manchester Combined Authority AQMA
- R1 Assessed human receptor locations

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	27/05/2025	Initial Issue	DH	GW	GW	KS

Jacobs

Client: MAG Manchester Airport

Project: ENVIRONMENTAL PERMIT APPLICATION - MANCHESTER AIRPORT AIR QUALITY IMPACT ASSESSMENT

Drawing Title: ASSESSED HUMAN RECEPTOR LOCATIONS AND AIR QUALITY MANAGEMENT AREA (AQMA)

Drawing Status: FINAL

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Client No.		

Drawing Number: FIGURE 2

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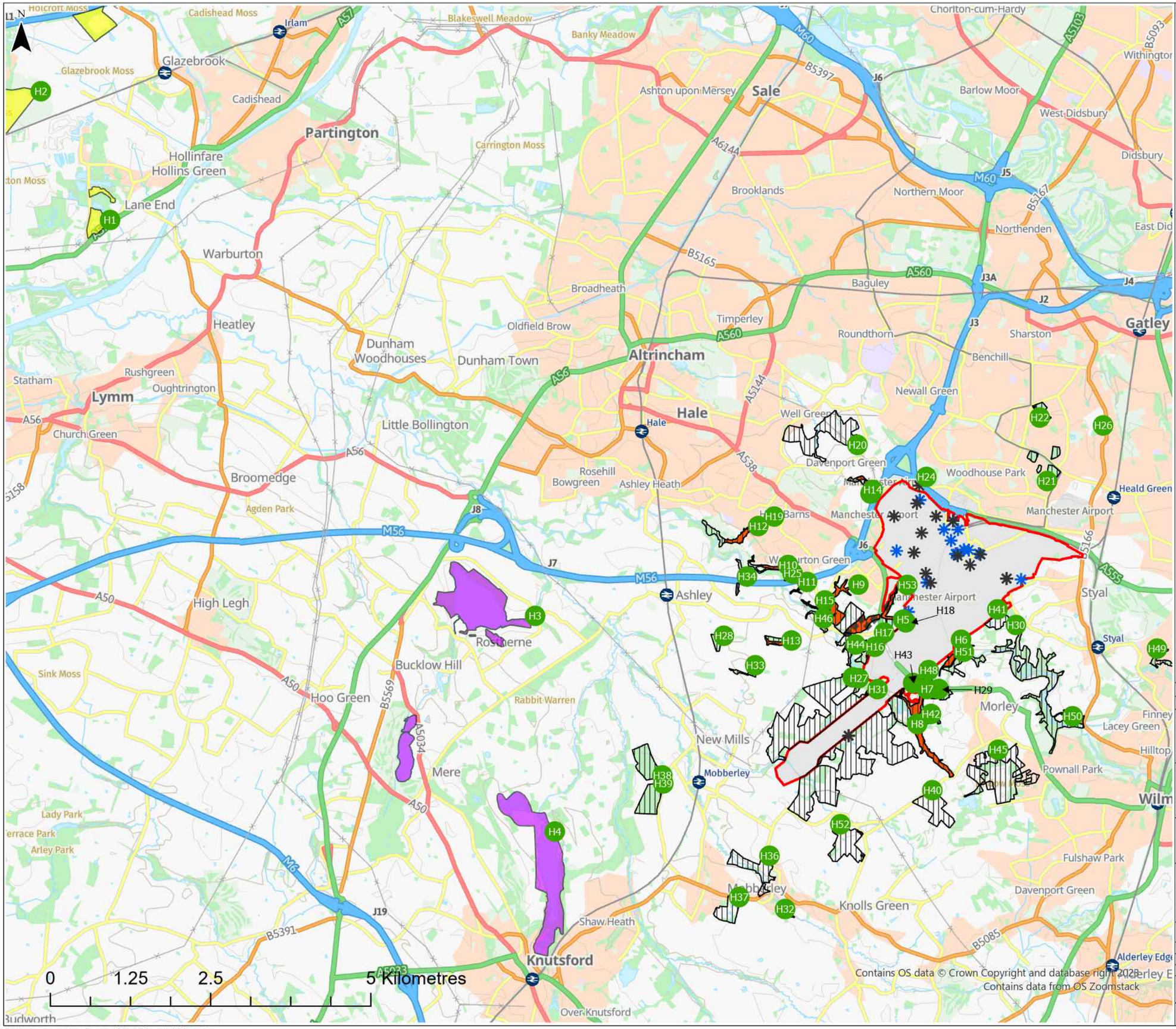

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	20/05/2025	Initial Issue	DH	GW	GW	KS

Jacobs

Client: MAG Manchester Airport

Project: ENVIRONMENTAL PERMIT APPLICATION - MANCHESTER AIRPORT AIR QUALITY IMPACT ASSESSMENT

Drawing Title: PROTECTED CONSERVATION AREAS

Drawing Status: FINAL

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Client No.		

Drawing Number: FIGURE 3

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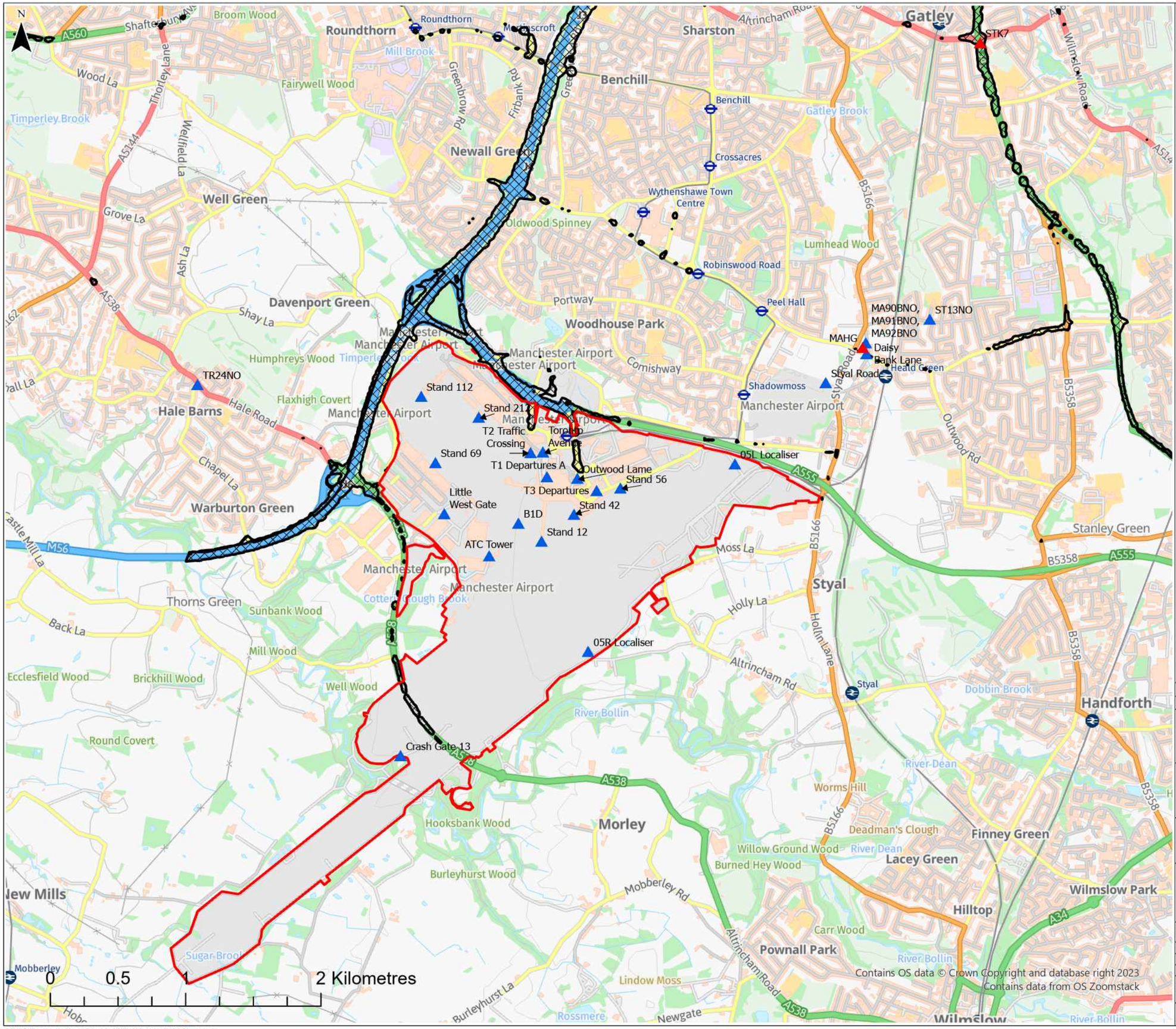

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	01/04/2025	Initial Issue	DH	GW	GW	KS

Jacobs

Client: MAG Manchester Airport

Project: ENVIRONMENTAL PERMIT APPLICATION - MANCHESTER AIRPORT AIR QUALITY IMPACT ASSESSMENT

Drawing Title: AIR QUALITY MANAGEMENT AREA (AQMA) AND MONITORING LOCATIONS IN THE VICNITY OF THE SITE

Drawing Status: FINAL

Scale @ A3	1:27,000	DO NOT SCALE
Jacobs No.	MAG42059	Rev 0
Client No.		

Drawing Number: FIGURE 4

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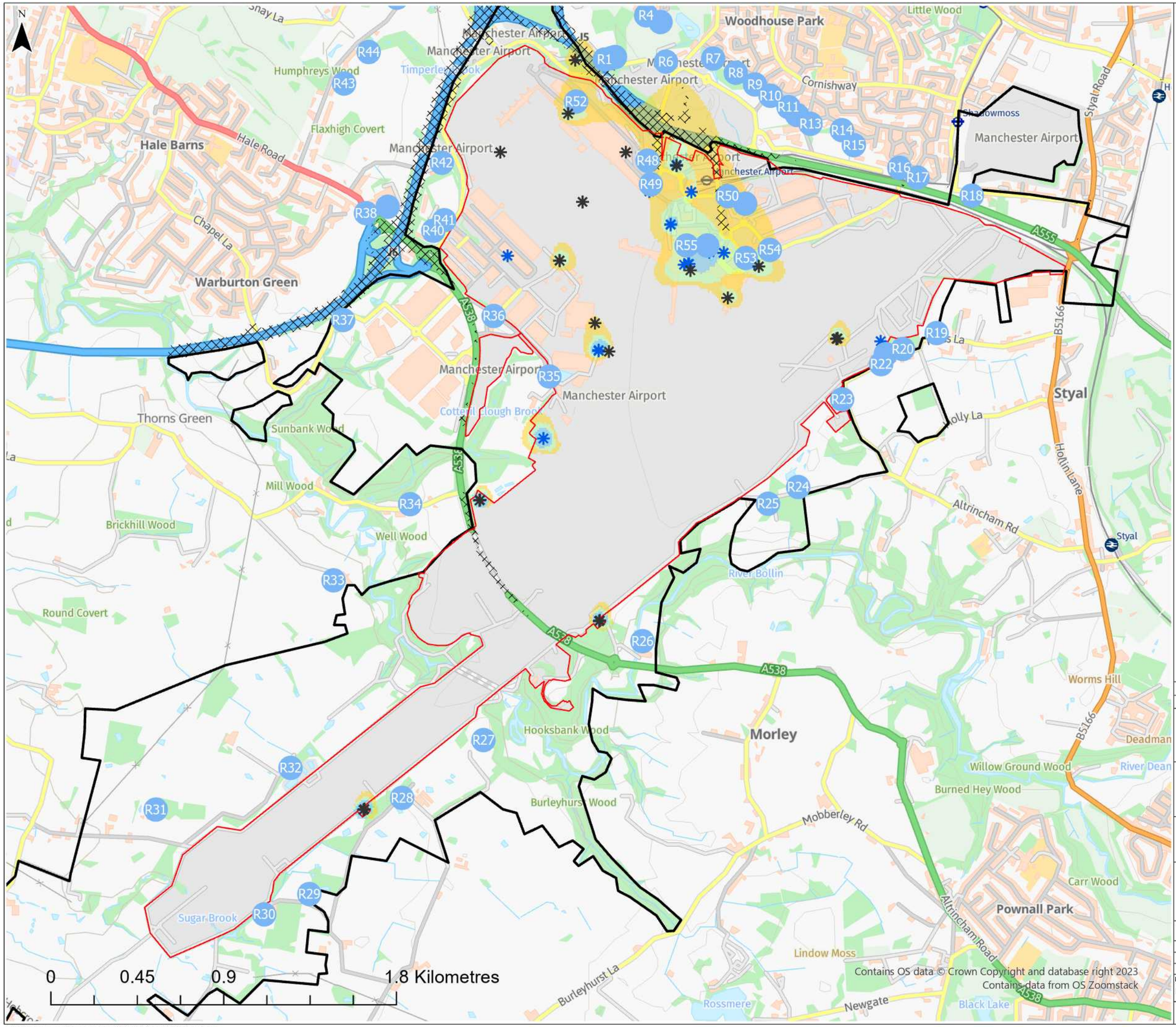

Legend

- Approximate MAG ownership boundary
- Approximate site fenceline
- Modelled standby generator stacks
- Modelled boiler stacks
- Greater Manchester Combined Authority AQMA
- R1 Assessed human receptor locations

Annual mean NO_2 process contributions ($\mu g/m^3$)

- 0 - 2
- 2 - 4
- 4 - 10
- 10 - 40
- >40

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	29/05/2025	Initial Issue	DH	GW	GW	KS

Jacobs

Client: MAG Manchester Airport

Project: ENVIRONMENTAL PERMIT APPLICATION - MANCHESTER AIRPORT AIR QUALITY IMPACT ASSESSMENT

Drawing Title: ANNUAL MEAN NITROGEN DIOXIDE PROCESS CONTRIBUTIONS ($\mu g/m^3$), 2022 METEOROLOGICAL DATA

Drawing Status: FINAL

Scale @ A3	1:19,000	DO NOT SCALE
Jacobs No.	MAG42059	Rev 0
Client No.		

Drawing Number: FIGURE 5

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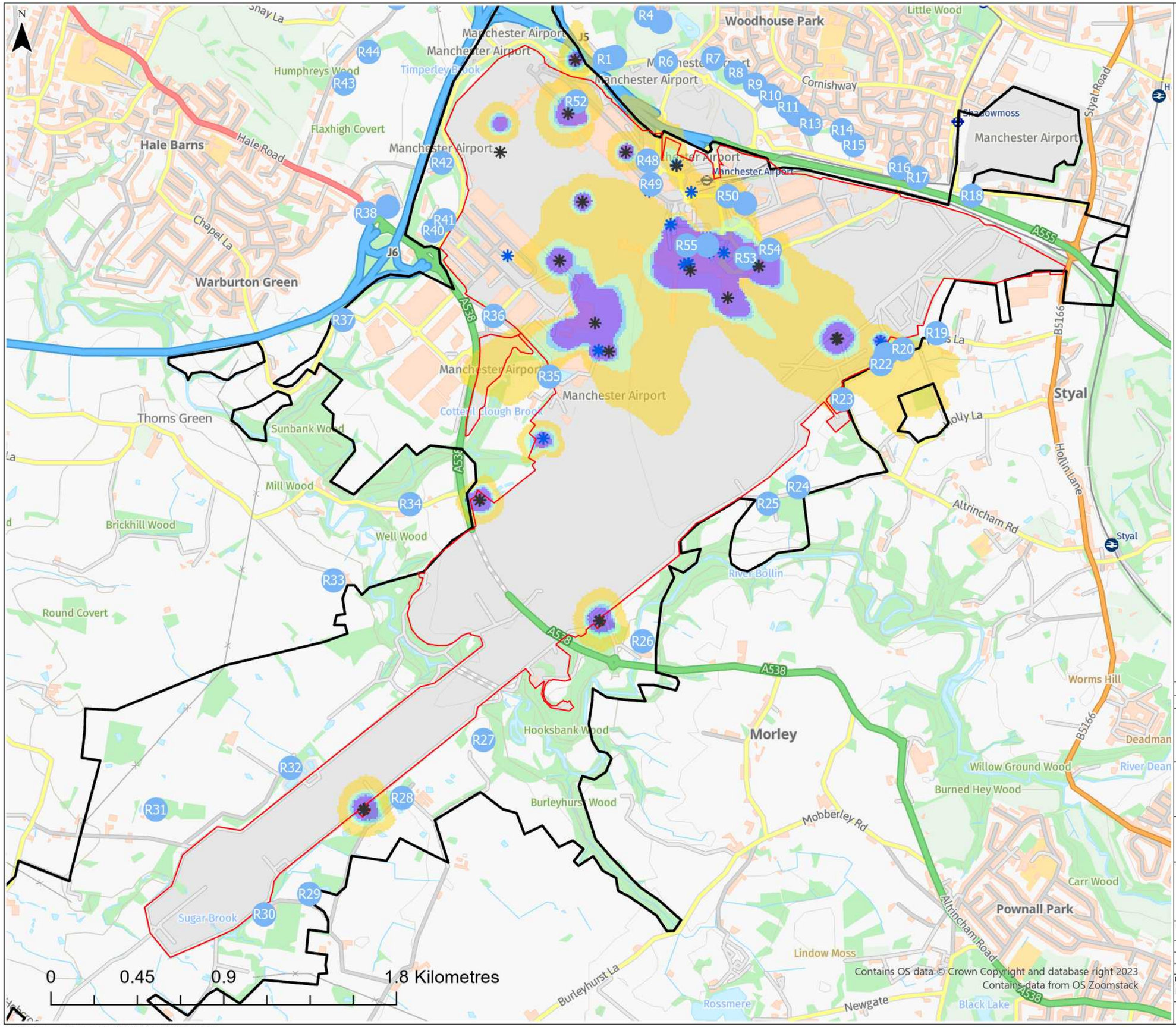

Legend

- Approximate MAG ownership boundary
- Approximate site fenceline
- Modelled standby generator stacks
- Modelled boiler stacks
- R1 Assessed human receptor locations

1-hour mean (99.79th percentile) NO_2 process contributions ($\mu g/m^3$)

- 0 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- >200

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	29/05/2025	Initial Issue	DH	GW	GW	KS

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Client: MAG Manchester Airport

Project: ENVIRONMENTAL PERMIT APPLICATION - MANCHESTER AIRPORT AIR QUALITY IMPACT ASSESSMENT

Drawing Title: 1-HOUR MEAN (99.79th PERCENTILE) NITROGEN DIOXIDE PROCESS CONTRIBUTIONS ($\mu g/m^3$), 2021 METEOROLOGICAL DATA

Drawing Status: FINAL

Scale @ A3	1:19,000	DO NOT SCALE
Jacobs No.	MAG42059	Rev 0
Client No.		

Drawing Number: FIGURE 6

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Appendix A. Dispersion Model Input Parameters

A.1 Emission Parameters

The emissions data used to represent the site described in Section 2 are set out in Table A-2 and Table A-3.

As some of the assessed combustion plant emit waste gases via a horizontal or capped stack, an effective stack diameter was calculated (see Table A-3). Some of these stack locations were manually adjusted to ensure the effective stack diameter was not located within a modelled building envelope.

Table A-1. Modelled stack location

Emission point ref	Stack location		Effective stack location	
	E (m)	N (m)	E (m)	N (m)
Assessed boilers				
A20	382900	384586	-	-
A07	381695	385367	-	-
A07	381695	385366	-	-
A01	381897	384989	-	-
A01	381901	384989	-	-
A03	382241	384988	-	-
A03	382240	384987	-	-
A03	382242	384987	-	-
A08	380956	385032	-	-
A08	380956	385031	-	-
A24	381319	385827	-	-
A24	381320	385826	-	-
A24	381321	385825	-	-
A14	381143	384080	-	-
A13	381835	385505	-	-
A13	381837	385506	-	-
A02	381806	385195	-	-
A02	381806	385194	-	-
A02	381806	385193	-	-
A18[1]	381876	384985	-	-
A05	382082	385047	-	-
A05	382082	385046	-	-
A24	381321	385825	-	-
A18[1]	381876	384985	-	-
A18[1]	381876	384985	-	-
A18[1]	381876	384985	-	-
A11[2]	381914	385364	-	-
A11[2]	381913	385363	-	-
A11[2]	381915	385363	-	-
A18[1]	381876	384985	-	-
A09	381431	384540	-	-
A09	381430	384536	-	-
A17	382007	385051	-	-
A17	382007	385050	-	-
Assessed standby generators				

Emission point ref	Stack location		Effective stack location	
	E (m)	N (m)	E (m)	N (m)
GEN02	381484	384533	-	-
GEN04	380810	383757	380812	383756
GEN05	380813	383760	380815	383758
GEN06	382675	384602	382674	384603
GEN07	382674	384600	382672	384601
GEN08	382672	384599	382669	384599
GEN09	381412	384681	-	-
GEN11	382265	384976	-	-
GEN14	381347	385312	-	-
GEN15	381309	386051	-	-
GEN17	381226	385007	-	-
GEN18	381228	385006	381229	385005
GEN19	381909	384956	381909	384955
GEN21	380210	382149	380208	382152
GEN22	380206	382145	380203	382148
GEN24	381437	383132	381434	383135
GEN25	381433	383129	381430	383132
GEN28	381573	385571	-	-
GEN29	381272	385772	-	-
GEN30	382103	384812	382104	384811
GEN31	381837	385500	-	-
GEN32	380919	385720	-	-

Table A-2. Dispersion modelling parameters for natural gas fuelled boilers

Emission point ref	Stack height (m)	Stack diameter (m)	Stack position / capped	Effective stack diameter	Modelled velocity (m/s)	Oxygen content of exhaust gas (dry) (%)	Moisture content of exhaust gas (%)	Actual flowrate (m^3/s)	Normalised flowrate (Nm^3/s)	Exhaust temp (Deg C)	NOx (mg/Nm^3)	NOx Release (g/s)	CO (mg/Nm^3)	CO Release (g/s)
A20	2.50	0.40	Horizontal	6.69	0.1	3.8	14.6	3.518	2.362	58.7	200	0.472	100	0.236
A07	38.00	1.20	Vertical	-	2.9	3.8	14.6	3.251	2.183	58.7	200	0.437	100	0.218
A07	38.00	1.20	Vertical	-	2.9	3.8	14.6	3.251	2.183	58.7	200	0.437	100	0.218
A01	12.84	0.60	Vertical	5.56	0.1	5.7	14.6	2.431	1.419	65.3	250	0.355	100	0.142
A01	12.84	0.60	Vertical	5.56	0.1	5.7	14.6	2.431	1.419	65.3	250	0.355	100	0.142
A03	23.00	0.60	Vertical	-	4.6	3.8	14.6	1.300	0.873	58.7	250	0.218	100	0.087
A03	23.00	0.60	Vertical	-	4.6	3.8	14.6	1.300	0.873	58.7	250	0.218	100	0.087
A03	23.00	0.60	Vertical	-	4.6	3.8	14.6	1.300	0.873	58.7	250	0.218	100	0.087
A08	17.00	0.40	Vertical	-	10.3	3.8	14.6	1.300	0.873	58.7	250	0.218	100	0.087
A08	17.00	0.40	Vertical	-	10.3	3.8	14.6	1.300	0.873	58.7	250	0.218	100	0.087
A24	30.92	0.60	Vertical	-	4.4	6.9	14.6	1.245	0.655	73.3	100	0.066	100	0.066
A24	30.92	0.60	Vertical	-	4.4	6.9	14.6	1.234	0.655	70.4	100	0.066	100	0.066
A24	30.92	0.60	Vertical	-	4.3	6.9	14.6	1.213	0.655	64.5	100	0.066	100	0.066
A14	2.50	0.25	Vertical / capped	2.19	0.1	3.8	14.6	0.375	0.252	58.7	250	0.063	100	0.025
A13	29.73	0.40	Vertical / capped	2.03	0.1	3.8	14.6	0.325	0.218	58.7	250	0.055	100	0.022
A13	29.73	0.40	Vertical / capped	2.03	0.1	3.8	14.6	0.325	0.218	58.7	250	0.055	100	0.022
A02	7.96	0.26	Vertical / capped	2.14	0.1	7.0	14.6	0.361	0.206	43.8	250	0.051	100	0.021
A02	7.96	0.26	Vertical / capped	2.19	0.1	7.1	14.6	0.378	0.206	57.1	250	0.051	100	0.021
A02	7.96	0.26	Vertical / capped	2.01	0.1	3.8	14.6	0.317	0.206	70.3	250	0.051	100	0.021

Emission point ref	Stack height (m)	Stack diameter (m)	Stack position / capped	Effective stack diameter	Modelled velocity (m/s)	Oxygen content of exhaust gas (dry) (%)	Moisture content of exhaust gas (%)	Actual flowrate (m^3/s)	Normalised flowrate (Nm^3/s)	Exhaust temp (Deg C)	NOx (mg/Nm^3)	NOx Release (g/s)	CO (mg/Nm^3)	CO Release (g/s)
A05	30.86	0.40	Vertical / capped	1.83	0.1	3.8	14.6	0.263	0.176	58.7	250	0.044	100	0.018
A05	30.86	0.40	Vertical / capped	1.83	0.1	3.8	14.6	0.263	0.176	58.7	250	0.044	100	0.018
A24	30.92	0.35	Vertical	-	2.6	3.8	14.6	0.254	0.171	58.7	250	0.017	100	0.017
A11	10.03	0.30	Vertical - shared	0.17	3.3	4.7	14.6	0.078	0.054	34.0	250	0.013	100	0.005
A11				0.17	3.3	5.0	14.6	0.079	0.054	30.8	250	0.013	100	0.005
A11				0.17	3.4	5.0	14.6	0.081	0.054	40.9	250	0.013	100	0.005
A09	3.00	0.25	Horizontal	1.10	0.1	5.7	14.6	0.095	0.058	48.4	250	0.015	100	0.006
A09	3.00	0.25	Horizontal	1.11	0.1	5.8	14.6	0.097	0.058	53.1	250	0.015	100	0.006
A17	14.59	0.30	Vertical / capped	1.43	0.1	11.2	14.6	0.162	0.056	90.7	250	0.014	100	0.006
A17	14.59	0.30	Horizontal	2.70	0.1	18.3	14.6	0.571	0.056	77.1	250	0.014	100	0.006
A18[2]	17.29	0.40	Vertical - shared / capped	2.74	0.1	-	-	0.592	0.374	58.2	250	0.093	100	0.037

Note 1: Normalised flows and concentrations presented at 273 K, 101.3 kPa, dry gas and oxygen content of 3%.

Note 2: As exhaust gas from the five A18 boilers associated with Terminal 1 Stand 21 F&B exit to the atmosphere via a shared capped stack, the individual volumetric flow rates and emission rates have been added and a single emission source included in the model to represent the A18 boilers presented in Table 2-1.

Note 3: The annual operation of the boilers differs (i.e. 12 hours, 4,200 hours or 8,400 hours), therefore emission source groups were included in the model and the annual mean predicted concentrations were factored accordingly. As some of the boilers waste gas exits into the atmosphere via a shared stack or via stacks in close proximity, an aai file was used in the model to represent a single plume for those boilers that operate for the same annual duration as the ADMS model will not run if a modelled group comprises emission sources with differing annual operation.

Table A-3. Dispersion modelling parameters for diesel fuelled standby generators

Emission point ref	Stack height (m)	Stack diameter (m)	Stack position / capped	Effective stack diameter	Modelled velocity (m/s)	Oxygen content of exhaust gas (DRY) (%)	Moisture content of exhaust gas (%)	Actual flowrate (m^3/s)	Normalised flowrate (Nm^3/s)	Temp (Deg C)	NOx (mg/Nm^3)	NOx Release (g/s)	CO (mg/Nm^3)	CO Release (g/s)	PM_{10} (mg/Nm^3)	PM_{10} Release (g/s)	SO_2 (mg/Nm^3)	SO_2 Release (g/s)
GEN02	2.50	0.25	Vertical, capped	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN04	2.80	0.33	Horizontal	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN05	2.80	0.33	Horizontal	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN06	4.00	0.12	Vertical, capped	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN07	4.00	0.12	Vertical, capped	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN08	2.50	0.25	Vertical, capped	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN09	2.50	0.25	Vertical, capped	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN11	3.00	0.25	Horizontal	5.37	0.1	10.2	7.9	2.263	1.435	445	750	1.076	39	0.056	13.0	0.019	0.6	0.001
GEN14	2.00	0.30	Horizontal	5.31	0.1	10.2	7.9	2.218	1.406	445	750	1.055	39	0.055	13.0	0.018	0.6	0.001
GEN15	2.73	0.35	Horizontal	4.48	0.1	10.2	7.9	1.575	0.999	445	750	0.749	39	0.039	13.0	0.013	0.6	0.001
GEN17[2]	2.83	0.30	Horizontal	5.58	0.1	10.2	7.9	2.444	1.550	445	750	1.162	39	0.060	13.0	0.020	0.6	0.001
GEN18[2]	2.83	0.30	Horizontal	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001
GEN19	1.60	0.30	Horizontal	4.80	0.1	10.2	7.9	1.810	1.148	445	750	0.861	39	0.045	13.0	0.015	0.6	0.001
GEN21	2.90	0.25	Horizontal - twin stacks	9.60	0.1	10.2	7.9	3.621	2.296	445	750	1.722	39	0.090	13.0	0.030	0.6	0.001
GEN22	2.90	0.25	Horizontal - twin stacks	9.60	0.1	10.2	7.9	3.621	2.296	445	750	1.722	39	0.090	13.0	0.030	0.6	0.001

Emission point ref	Stack height (m)	Stack diameter (m)	Stack position / capped	Effective stack diameter	Modelled velocity (m/s)	Oxygen content of exhaust gas (DRY) (%)	Moisture content of exhaust gas (%)	Actual flowrate (m^3/s)	Normalised flowrate (Nm^3/s)	Temp (Deg C)	NOx (mg/Nm^3)	NOx Release (g/s)	CO (mg/Nm^3)	CO Release (g/s)	PM_{10} (mg/Nm^3)	PM_{10} Release (g/s)	SO_2 (mg/Nm^3)	SO_2 Release (g/s)
GEN24	2.90	0.25	Horizontal - twin stacks	9.60	0.1	10.2	7.9	3.621	2.296	445	750	1.722	39	0.090	13.0	0.030	0.6	0.001
GEN25	2.90	0.25	Horizontal - twin stacks	9.60	0.1	10.2	7.9	3.621	2.296	445	750	1.722	39	0.090	13.0	0.030	0.6	0.001
GEN28	2.50	0.25	Vertical, capped	4.49	0.1	10.2	7.9	1.584	1.004	445	750	0.753	39	0.039	13.0	0.013	0.6	0.001
GEN29	2.80	0.35	Horizontal	8.72	0.1	10.2	7.9	5.974	3.788	445	750	2.841	39	0.148	13.0	0.049	0.6	0.002
GEN30	3.00	0.20	Horizontal - twin stacks	7.89	0.1	10.2	7.9	2.444	1.550	445	750	1.162	39	0.060	13.0	0.020	0.6	0.001
GEN31	29.73	0.35	Vertical / capped	5.90	0.1	10.2	7.9	2.730	1.731	445	750	1.298	39	0.068	13.0	0.023	0.6	0.001
GEN32	2.80	0.30	Horizontal	5.04	0.1	10.2	7.9	1.991	1.263	445	750	0.947	39	0.049	13.0	0.016	0.6	0.001

Note 1: Normalised flows and concentrations presented at 273 K, 101.3 kPa, dry gas and oxygen content of 15%.

Note 2: As the generators waste gas exits in the atmosphere via stacks in close proximity, an aai file was used in the model to represent a single plume.

A.2 Dispersion Model Inputs

A.2.1 Structural Influences on Dispersion

The main structures within the site which have been included in the model to reflect the existing site layout are identified within Table A-4. A sensitivity study has been carried out to assess the sensitivity of the model to using the buildings module.

Table A-4. Building parameters

Building	Modelled building shapes	Height (m)	Length (m)	Width / diameter (m)	Angle of length to north	Centre point co-ordinates	
						Easting	Northing
Multi Storey T2 W1	Rectangular	25.48	158.73	63.07	134.5	381257	385881
Multi Storey T2 W2 building	Rectangular	28.92	25.59	10.86	44.5	381330	385835
Terminal 2 building 1	Rectangular	29.03	153.00	138.00	134.9	381389	385729
Terminal 2 building 5	Rectangular	8.40	49.60	37.00	134.5	381692	385354
Cargo Warehouse 1	Rectangular	9.36	292.60	70.60	134.7	381010	385136
Building 10	Rectangular	9.17	143.76	25.78	135.0	381019	384989
Building011	Rectangular	4.35	25.78	7.00	45.0	380962	385045
Building012	Rectangular	8.70	34.50	47	45.0	380942	385069
T1 building 1	Rectangular	10.01	106.00	170.00	0.0	381905	385010
T1 building 2	Rectangular	37.72	76.00	15.14	0.0	382002	385007
West Side Fire Building	Rectangular	3.90	33.00	21.50	5.9	381444	384531
Voyager House	Rectangular	28.73	18.00	40.00	339.0	381839	385501
The Station	Rectangular	10.43	59.00	128.00	345.0	381962	385413
Building025	Rectangular	29.82	100.00	19.50	83.5	381969	385445
Building026	Rectangular	11.99	255.00	10.00	44.5	382185	384907
Gen 17 & 18 housing	Rectangular	3.76	18.53	18.48	44.0	381218	385016
Olympic House	Rectangular	30.70	40.00	15.00	89.0	382092	385049
T1 Arrivals Boiler House	Rectangular	7.46	15.66	11.12	359.0	381811	385191
Building027	Rectangular	11.79	66.26	20.62	90.0	381985	385054
Gen 6 & 7 housing	Rectangular	3.59	23.80	16.66	51.0	382683	384596
A14 housing	Rectangular	14.95	64.86	32.84	57.5	381132	384050
Gen 4 & 5 housing	Rectangular	4.71	25.96	17.00	141.0	380803	383769
Gen 21 & 22 housing	Rectangular	5.32	27.70	18.20	51.0	380209	382134
Gen 24 & 25 housing	Rectangular	5.10	28.19	19.42	51.0	381435	383117
Thomas Cook Hangar	Rectangular	29.14	130.00	103.54	6.3	381349	384723

A.3 Other Model Inputs

Other model input parameters are presented in Table A-5.

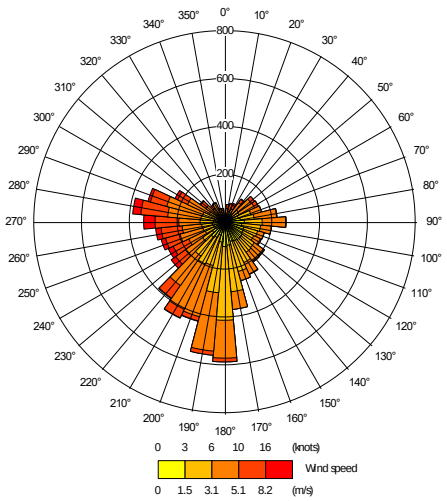
Table A-5. Other model inputs

Parameter	Value used	Comments
Surface roughness length for dispersion site	0.5 m	This is appropriate for the dispersion site where the surrounding local land-use is a mixture of open grassland and residential and commercial premises. A sensitivity study has been carried out with fixed surface roughness values of 0.1 m and 1.0 m.
Surface roughness length at meteorological station site	0.5 m	The meteorological station at Manchester Airport has been used in the assessment.
Minimum Monin-Obukhov Length	1 m	Typical values for the dispersion site
Surface Albedo	0.23 m	Typical values for the dispersion site
Priestley-Taylor Parameter	1 m	Typical values for the dispersion site
Terrain	Not included	Guidance for the use of the ADMS model suggests that terrain is normally incorporated within a modelling study when the gradient exceeds 1:10. As the gradient in the vicinity of the site does not exceed 1:10, a terrain file was not included in the modelling.
Meteorological data	Manchester Airport meteorological station, 2019 - 2023	The meteorological station at Manchester Airport has been used in the assessment.
Combined flue option	Yes	Where the boilers or standby generator waste gases exits via a shared stack or via a stack in close proximity, an aai file was used in the model to represent a single plume, for those emission sources that operate for the same annual duration.

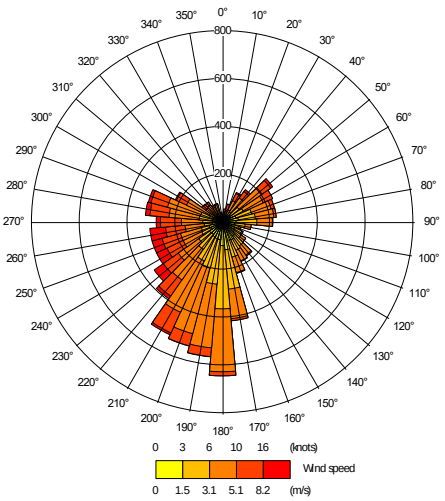
A.3.1 Meteorological Data

The wind roses for each year of meteorological data utilised in the assessment are shown below.

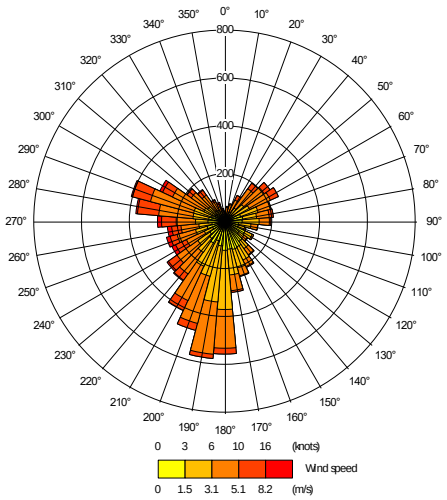
Manchester Airport meteorological data, 2019



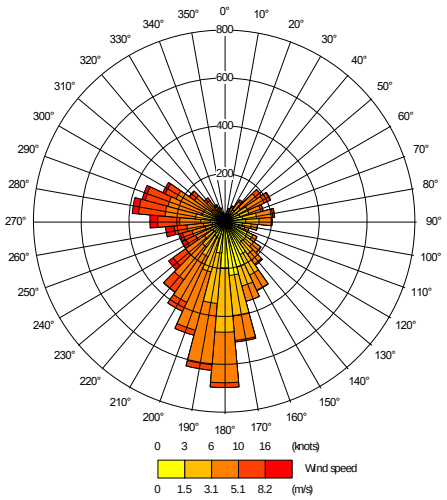
Manchester Airport meteorological data, 2020



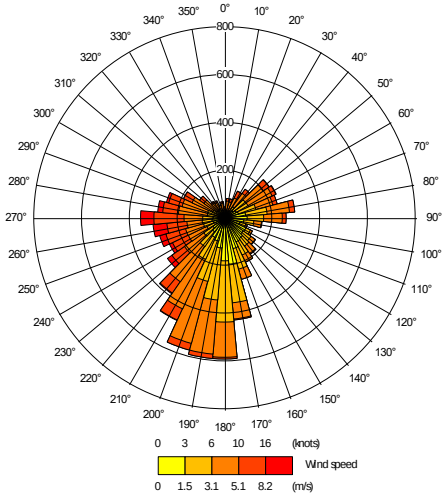
Manchester Airport meteorological data, 2021



Manchester Airport meteorological data, 2022



Manchester Airport meteorological data, 2023



A.3.2 Model Domain/Study Area

The ADMS model calculates the predicted concentrations based on a user defined grid system. Generally, the larger the study area, the greater the distance between the grid calculation points and the lower the resolution of the dispersion model predictions. This is to be offset against the need to encompass an appropriately wide area within the dispersion modelling study to capture the dispersion of the stack emissions.

The modelled grid was specified as a 6 km x 6 km grid with calculation points every 20 m (i.e. 301 points along each grid axis) with a grid height of 1.5 m. This size of grid was selected to provide a good grid resolution and also encompass a sufficient area so that the maximum predicted concentrations would be determined. The area within the site boundary was excluded from the modelled grid as it is not accessible to the general public. The modelled grid parameters are presented in Table A-6.

Table A-6. Modelled grid parameters

	Start	Finish	Number of grid points	Grid spacing (m)
Easting	378677	384677	301	20
Northing	381458	387458	301	20
Grid height	1.5	1.5	1	-

As well as the modelled grid, the potential impact at 56 sensitive human receptors (e.g. exposure locations such as residential properties, hotels and car parks), and 53 protected conservation areas within the required study area were assessed. For those protected conservation areas that encompass / border the site, the grid points (at ground level) presented in Table A-6, were used to represent the protected conservation areas and determine the maximum process contributions.

The receptor locations are shown in Figure 2 and Figure 3 and further details of the human receptor locations and protected conservation areas are provided in Table A-7 and Table A-8 respectively.

For the 'Greater Manchester Combined Authority AQMA', those grid points presented in Table A-6, which encompass the AQMA, were used to determine the maximum annual mean NO_2 concentrations and 24-hour mean PM_{10} (90.41st percentile) concentrations.

Table A-7. Assessed sensitive human receptors

Receptor	Description	Off-site / on-site	Modelled height (m)	Grid reference		Distance from approximate site centre (km)	Direction from the approximate site centre
				Easting	Northing		
R1	Residential property on Thorley Lane	Off-site	1.5	381462	386054	1.24	North-northwest
R2	Residential property on Thorley Lane	Off-site	1.5	381497	386061	1.24	North-northwest
R3	Residential property on Thorley Lane	Off-site	1.5	381516	386067	1.24	North-northwest
R4	Residential property on Painswick Road	Off-site	1.5	381678	386284	1.44	North
R5	Residential property on Painswick Road	Off-site	1.5	381753	386249	1.40	North
R6	Etrop Grange Hotel	Off-site	1.5	381781	386043	1.19	North
R7	Residential property on Hilary Road	Off-site	1.5	382027	386059	1.24	North-northeast
R8	Residential property on Hilary Road	Off-site	1.5	382145	385985	1.20	North-northeast
R9	Residential property on Felskirk Road	Off-site	1.5	382245	385924	1.18	North-northeast
R10	Residential property on Felskirk Road	Off-site	1.5	382326	385865	1.16	North-northeast
R11	Residential property on Lincombe Road	Off-site	1.5	382420	385806	1.16	Northeast
R12	Residential property on Dentdale Walk	Off-site	1.5	382464	385765	1.16	Northeast
R13	Residential property on Woodhouse Lane	Off-site	1.5	382534	385719	1.16	Northeast
R14	Residential property on Thornsgreen Road	Off-site	1.5	382698	385686	1.26	Northeast
R15	Residential property on Thornsgreen Road	Off-site	1.5	382760	385608	1.26	Northeast
R16	Residential property on Lynside Walk	Off-site	1.5	382997	385490	1.39	East-northeast
R17	Residential property on Carsdale Road	Off-site	1.5	383091	385439	1.46	East-northeast
R18	Residential property on Ringway Road	Off-site	1.5	383374	385345	1.69	East-northeast
R19	Residential property on Moss Lane	Off-site	1.5	383191	384629	1.45	East
R20	Residential property on Moss Lane	Off-site	1.5	383015	384546	1.29	East-southeast
R21	Residential property on Moss Lane	Off-site	1.5	382926	384519	1.21	East-southeast
R22	Residential property on Moss Lane	Off-site	1.5	382902	384467	1.20	East-southeast
R23	Residential property on Moss Lane	Off-site	1.5	382699	384284	1.10	East-southeast
R24	Residential property on Altrincham Road	Off-site	1.5	382470	383827	1.24	Southeast

Receptor	Description	Off-site / on-site	Modelled height (m)	Grid reference		Distance from approximate site centre (km)	Direction from the approximate site centre
				Easting	Northing		
R25	Residential property on Altrincham Road	Off-site	1.5	382313	383740	1.24	South-southeast
R26	Airport Inn Manchester	Off-site	1.5	381659	383024	1.83	South
R27	Residential property on Blakeley Lane	Off-site	1.5	380831	382509	2.52	South-southwest
R28	Residential property on Blakeley Lane	Off-site	1.5	380407	382208	2.97	South-southwest
R29	Residential property on Ostler's Lane	Off-site	1.5	379924	381707	3.64	South-southwest
R30	Residential property on Ostler's Lane	Off-site	1.5	379689	381601	3.85	South-southwest
R31	Residential property on Wood Lane	Off-site	1.5	379124	382147	3.77	Southwest
R32	Residential property on Wood Lane	Off-site	1.5	379826	382364	3.15	Southwest
R33	Residential property on Castle Mill Lane	Off-site	1.5	380050	383341	2.28	Southwest
R34	Residential property on Mill Lane	Off-site	1.5	380449	383738	1.72	Southwest
R35	Residential property / play park on Wilmslow Old Road	Off-site	1.5	381174	384403	0.74	Southwest
R36	Residential property on Pinfold Lane	Off-site	1.5	380884	384718	0.89	West
R37	Residential property on Sunbank Lane	Off-site	1.5	380100	384697	1.67	West
R38	Residential property on Hale Road	Off-site	1.5	380219	385254	1.59	West-northwest
R39	Deltas Hotel Manchester Airport	Off-site	1.5	380332	385287	1.49	West-northwest
R40	Holiday Inn Express Manchester Airport	Off-site	1.5	380570	385162	1.23	West-northwest
R41	Premier Inn Manchester Airport	Off-site	1.5	380627	385217	1.19	West-northwest
R42	Residential property on Hasty Lane	Off-site	1.5	380614	385516	1.33	West-northwest
R43	Residential property on Brooks Drive	Off-site	1.5	380105	385929	1.98	West-northwest
R44	Residential property on Brooks Drive	Off-site	1.5	380233	386093	1.97	Northwest
R45	Residential property on Brooks Drive	Off-site	1.5	380380	386376	2.06	Northwest
R46	Residential property on Rowarth Road	Off-site	1.5	381063	386746	2.02	North-northwest
R47	Residential property on Bleasdale Road	Off-site	1.5	381317	386515	1.72	North-northwest
R48	Holiday Inn Hotel	On-site	1.5	381686	385527	0.68	North

Receptor	Description	Off-site / on-site	Modelled height (m)	Grid reference		Distance from approximate site centre (km)	Direction from the approximate site centre
				Easting	Northing		
R49	Radisson Blu Hotel, Manchester Airport	On-site	1.5	381703	385404	0.56	North
R50	Clayton Hotel, Manchester Airport	On-site	1.5	382103	385342	0.60	Northeast
R51	Crowne Plaza, Manchester Airport	On-site	1.5	382194	385303	0.63	Northeast
R52	Multi Storey T2 West multi-story car park	On-site	26.9	381313	385835	1.08	North-northwest
R53	Multi Storey T3 car park	On-site	12.9	382197	385020	0.47	East-northeast
R54	Manchester Airport Mid Stay T1/3	On-site	20	382322	385062	0.60	East-northeast
R55	Manchester Airport Multi Storey T1	On-site	19.5	381889	385085	0.27	North-northeast
R56	Manchester Airport Mid Stay T1/3	On-site	20	381996	385085	0.33	Northeast

Table A-8. Assessed protected conservation area locations (modelled at ground level)

Receptor	Description	Grid reference		Distance from approximate site centre (km)	Direction from the approximate site centre
		Easting	Northing		
H1	Rixton Clay Pits SAC	368686	390196	14.13	West-northwest
H2	Manchester Mosses SAC	367606	392205	15.95	West-northwest
H3	Rostherne Mere Ramsar	375317	384018	6.50	West
H4	Midland Mere & Mosses - Phase 1 Ramsar	375625	380652	7.43	Southwest
H5	Cotteril Clough SSSI & AW & LWS	Modelled grid		Adjacent to western boundary	
H6	Oversley Farm Wood (ID 1104307) AW & LWS	381962	383645	1.22	South
H7	Ancient woodland (ID 1417980)	381430	382876	2.00	South
H8	Ancient woodland (ID 1417975)	381277	382332	2.56	South
H9	Sunbank Wood (ID 1105635) AW & LWS	380361	384506	1.44	West-southwest
H10	Warburton Wood (ID 1105631) AW	379263	384812	2.50	West
H11	Hennersley Bank (ID 1505490) AW	379561	384548	2.22	West
H12	Bently/Tomfield Banks (ID 1105630) AW	378799	385419	3.02	West

Receptor	Description	Grid reference		Distance from approximate site centre (km)	Direction from the approximate site centre
		Easting	Northing		
H13	Ancient woodland (ID 1417983) AW & LWS	379317	383634	2.73	West-southwest
H14	Davenport Green Wood (ID 1505436)	380583	385984	1.64	Northwest
H15	Bollin Bank (ID 1505489) AW & LWS	379836	384259	2.01	West-southwest
H16	Well and Double Woods LWS	380617	383536	1.74	Southwest
H17	Road Cutting at Castle Hill LWS	Modelled grid		Adjacent to western boundary	
H18	Ponds near Manchester Airport Runway LWS	Modelled grid		Adjacent to western boundary	
H19	Bentley & Tomfield Banks LWS	379046	385568	2.81	West-northwest
H20	Ponds at Davenport Green LWS	380345	386687	2.32	Northwest
H21	Big Wood LWS	383304	386122	2.00	Northeast
H22	Park Wood LWS	383190	387113	2.68	North-northeast
H23	Davenport Green Wood LWS	380550	385928	1.62	Northwest
H24	Painswick Park Meadow LWS	381420	386187	1.38	North-northwest
H25	Rossmill LWS	379333	384682	2.43	West
H26	Heald Green Marsh LWS	384177	386990	3.23	Northeast
H27	West Woodend Wood LWS	380364	383045	2.28	Southwest
H28	Ecclesfield Wood LWS	378261	383708	3.68	West-southwest
H29	Wood Near Valley House LWS	381614	382877	1.98	South
H30	Styal Woods LWS	382818	383876	1.44	Southeast
H31	East Woodend Wood LWS	380659	382874	2.26	South-southwest
H32	Mobberley Brook Wood LWS	379217	379443	5.97	South-southwest
H33	Round Covert LWS	378751	383248	3.41	West-southwest
H34	Jackson's Bank East LWS	378622	384632	3.15	West
H35	Wood End - Lady Lane LWS	Modelled grid		Adjacent to western boundary	
H36	Fields Near Mobberley Brook LWS	378973	380275	5.36	South-southwest
H37	Town Lane Farm Sand Pit And Ponds LWS	378500	379630	6.15	South-southwest

Receptor	Description	Grid reference		Distance from approximate site centre (km)	Direction from the approximate site centre
		Easting	Northing		
H38	Raleigh Wood LWS	377301	381529	5.56	Southwest
H39	Square Wood LWS	377317	381403	5.62	Southwest
H40	Saltersley Hall Farm LWS	381513	381297	3.56	South
H41	Oversley Lodge LWS	382529	384119	1.06	Southeast
H42	Burleyhurst Wood LWS	381492	382488	2.38	South
H43	Hooksbank Wood And Bollin Oxbows LWS	381215	382971	1.96	South-southwest
H44	Bollin Oxbow At Castle Hill LWS	380316	383571	1.93	Southwest
H45	Lindow Moss & Newgate Nature Reserve LWS	382542	381929	3.02	South-southeast
H46	Mill Wood; Castle Mill LWSs	379816	383981	2.13	West-southwest
H47	Lindow Moss & Morley Green Heath LWS	382539	381929	3.02	South-southeast
H48	Oversley Ford Brickworks And Road Embankment LWS	Modelled grid		Adjacent to southern boundary	
H49	Dobbin Brook Clough LWS	385019	383507	3.52	East-southeast
H50	Norcliffe Farm, Styal LWS	383703	382451	3.09	Southeast
H51	Holly Bank Wood LWS	382005	383458	1.41	South
H52	Park Farm Grassland LWS	380079	380766	4.42	South-southwest
H53	Cotteril Clough AW	381124	384501	0.72	West-southwest

A.3.3 Treatment of Oxides of Nitrogen

It was assumed that 70% of NOx emitted from the assessed combustion plant will be converted to NO_2 at ground level in the vicinity of the site, for determination of the annual mean NO_2 concentrations, and 35% of emitted NOx will be converted to NO_2 for determination of the hourly mean NO_2 concentrations, in line with guidance provided by the Environment Agency (Environment Agency, 2024). This approach is likely to overestimate the annual mean NO_2 concentrations considerably at the most relevant assessment locations close to the site.

A.3.4 Calculation of PECs

In the case of long-term mean concentrations, it is relatively straightforward to combine modelled process contributions with baseline air quality levels, as long-term mean concentrations due to plant emissions could be added directly to long-term mean baseline concentrations.

It is not possible to add short-period peak baseline and process concentrations directly. This is because the conditions which give rise to peak ground-level concentrations of substances emitted from an elevated source at a particular location and time are likely to be different to the conditions which give rise to peak concentrations due to emissions from other sources.

As described in the Environment Agency guidance (Environment Agency, 2024), for most substances the short-term peak PC values are added to twice the long-term mean baseline concentration to provide a reasonable estimate of peak concentrations due to emissions from all assessed sources.

A.3.5 Modelling Uncertainty

There are always uncertainties in dispersion models, in common with any environmental modelling study, because a dispersion model is an approximation of the complex processes which take place in the atmosphere. Some of the key factors which lead to uncertainty in atmospheric dispersion modelling are as follows.

- The quality of the model output depends on the accuracy of the input data enter the model. Where model input data are a less reliable representation of the true situation, the results are likely to be less accurate.
- The meteorological data sets used in the model are not likely to be completely representative of the meteorological conditions at the site. However, the most suitable available meteorological data was chosen for the assessment.
- Models are generally designed on the basis of data obtained for large scale point sources and may be less well validated for modelling emissions from smaller scale sources.
- The dispersion of pollutants around buildings is a complex scenario to replicate. Dispersion models can take account of the effects of buildings on dispersion; however, there will be greater uncertainty in the model results when buildings are included in the model.
- Modelling does not specifically take into account individual small-scale features such as vegetation, local terrain variations and off-site buildings. The roughness length (zo) selected is suitable to take general account of the typical size of these local features within the model domain.
- To take account of these uncertainties and to ensure the predictions are more likely to be over-estimates than under-estimates, the conservative assumptions described below have been used for this assessment.

A.3.6 Conservative Assumptions

The conservative assumptions adopted in this study are summarised below.

- The assessed combustion plant were assumed to operate at maximum load for the annual operational hours as presented in Table 2-1. In practice, the combustion plant will have periods of shut-down and maintenance and may not always operate at maximum load.
- The study is based on emissions being continuously at the emission limits and calculated emissions specified.
- The maximum predicted concentrations at any residential areas as well as off-site locations were considered for the assessment of short-term concentrations and the maximum predicted concentrations

at any residential areas were considered for assessment of annual mean concentrations within the air quality study area. Concentrations at other locations will be less than the maximum values presented.

- The highest predicted concentrations obtained using any of the five different years of meteorological data have been used in this assessment. During a typical year, the ground level concentrations are likely to be lower.
- It was assumed that 100% of the particulate matter emitted from the plant is in the PM_{10} size fraction. The actual proportion will be less than 100%.
- It was assumed that 100% of the particulate matter emitted from the plant is in the $PM_{2.5}$ size fraction. The actual proportion will be less than 100%.
- It was assumed the vegetation type selected for the respective protected conservation areas is present at the specific modelled location where the highest PC was predicted.

Appendix B. Calculating Acid and Nitrogen Deposition

B.1 Methodology

Nitrogen and acid deposition have been predicted using the methodologies presented in the Air Quality Technical Advisory Group (AQTAG) guidance note: AQTAG 06 '*Technical Guidance on Detailed Modelling Approach for an Appropriate Assessment for Emissions to Air*' (AQTAG, 2014).

When assessing the deposition of nitrogen, it is important to consider the different deposition properties of nitric oxide and nitrogen dioxide. It is generally accepted that there is no wet or dry deposition arising from nitric oxide in the atmosphere. Thus, it is normally necessary to distinguish between nitric oxide (NO) and nitrogen dioxide in a deposition assessment. In this case, the conservative assumption that 70% of the oxides of nitrogen are in the form of nitrogen dioxide was adopted.

Information on the existing nitrogen and acid deposition was obtained from the APIS database (Centre for Ecology and Hydrology, 2025). Information on the deposition critical loads for the European designated sites and SSSI and were also obtained from the APIS database using the Site Relevant Critical Load function.

The annual dry deposition flux can be obtained from the modelled annual average ground level concentration via use of the formula:

Dry deposition flux ($\mu g/m^2/s$) = ground level concentration ($\mu g/m^3$) x deposition velocity (m/s)

(where µg refers to µg of the chemical species under consideration).

The deposition velocities for various chemical species recommended for use (AQTAG, 2014) are shown below in Table B-1.

Table B-1. Recommended dry deposition velocities

Chemical species	Recommended deposition velocity (m/s)	
NO_2	Grassland (short)	0.0015
	Forest (tall)	0.003
SO_2	Grassland (short)	0.012
	Forest (tall)	0.024

To convert the dry deposition flux from units of $\mu g/m^2/s$ (where µg refers to µg of the chemical species) to units of kg N/ha/yr (where kg refers to kg of nitrogen) multiply the dry deposition flux by the conversion factors shown in Table B-2. To convert dry deposition flux to acid deposition multiply by factors shown in Table B-3.

Table B-2. Dry deposition flux conversion factors for nutrient nitrogen deposition

$\mu g/m^2/s$ of species	Conversion factor to kg N/ha/yr
NO_2	95.9

Table B-3. Dry deposition flux conversion factors for acidification

$\mu g/m^2/s$ of species	Conversion factor to keq/ha/yr
NO_2	6.84
SO_2	9.84

Appendix C. Results at Assessed Human Locations

Table C-1. Results of detailed assessment at assessed human receptor locations for maximum 8-hour mean and 1-hour mean CO predicted concentrations

Receptor ID	Baseline air quality level (µg/m³)	Maximum 8-hour running mean					Maximum 1-hour mean				
		EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R1	379	10,000	13.4	393	0.1%	3.9%	30,000	19.3	399	0.1%	1.3%
R2	379		12.8	392	0.1%	3.9%		20.2	400	0.1%	1.3%
R3	379		12.3	392	0.1%	3.9%		20.6	400	0.1%	1.3%
R4	379		12.4	392	0.1%	3.9%		16.8	396	0.1%	1.3%
R5	379		12.9	392	0.1%	3.9%		17.9	397	0.1%	1.3%
R6	379		15.2	395	0.2%	3.9%		20.7	400	0.1%	1.3%
R7	381		11.9	393	0.1%	3.9%		18.9	400	0.1%	1.3%
R8	367		10.6	377	0.1%	3.8%		16.9	384	0.1%	1.3%
R9	367		10.7	377	0.1%	3.8%		17.8	384	0.1%	1.3%
R10	367		9.9	377	0.1%	3.8%		16.7	383	0.1%	1.3%
R11	367		8.9	376	0.1%	3.8%		16.2	383	0.1%	1.3%
R12	367		8.4	375	0.1%	3.8%		18.3	385	0.1%	1.3%
R13	367		8.8	375	0.1%	3.8%		20.5	387	0.1%	1.3%
R14	367		8.9	376	0.1%	3.8%		17.5	384	0.1%	1.3%
R15	367		8.8	375	0.1%	3.8%		16.8	383	0.1%	1.3%
R16	367		7.2	374	0.1%	3.7%		14.6	381	0.0%	1.3%
R17	371		7.0	378	0.1%	3.8%		13.2	384	0.0%	1.3%
R18	371		5.9	377	0.1%	3.8%		14.3	385	0.0%	1.3%
R19	358		17.2	376	0.2%	3.8%		33.0	391	0.1%	1.3%
R20	358		42.8	401	0.4%	4.0%		64.2	423	0.2%	1.4%
R21	354		63.2	417	0.6%	4.2%		89.1	443	0.3%	1.5%
R22	354		26.4	380	0.3%	3.8%		49.9	404	0.2%	1.3%
R23	354		11.9	366	0.1%	3.7%		29.9	384	0.1%	1.3%
R24	347		9.7	356	0.1%	3.6%		17.7	364	0.1%	1.2%
R25	347		7.9	354	0.1%	3.5%		19.2	366	0.1%	1.2%
R26	339		4.2	343	0.0%	3.4%		11.1	350	0.0%	1.2%

Receptor ID	Baseline air quality level (µg/m³)	Maximum 8-hour running mean					Maximum 1-hour mean				
		EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R27	326		4.4	330	0.0%	3.3%		9.5	335	0.0%	1.1%
R28	326		4.7	330	0.0%	3.3%		10.2	336	0.0%	1.1%
R29	300		4.8	305	0.0%	3.0%		11.5	312	0.0%	1.0%
R30	300		4.8	305	0.0%	3.0%		9.2	309	0.0%	1.0%
R31	321		4.6	326	0.0%	3.3%		8.8	330	0.0%	1.1%
R32	321		4.9	326	0.0%	3.3%		9.2	330	0.0%	1.1%
R33	342		6.9	349	0.1%	3.5%		11.7	354	0.0%	1.2%
R34	342		7.9	350	0.1%	3.5%		13.6	356	0.0%	1.2%
R35	350		12.3	363	0.1%	3.6%		22.7	373	0.1%	1.2%
R36	354		9.8	364	0.1%	3.6%		16.1	370	0.1%	1.2%
R37	354		8.5	362	0.1%	3.6%		14.7	369	0.0%	1.2%
R38	366		10.2	376	0.1%	3.8%		16.5	382	0.1%	1.3%
R39	366		10.2	376	0.1%	3.8%		17.2	383	0.1%	1.3%
R40	366		12.1	378	0.1%	3.8%		18.8	385	0.1%	1.3%
R41	366		11.9	378	0.1%	3.8%		19.7	385	0.1%	1.3%
R42	366		10.9	377	0.1%	3.8%		22.2	388	0.1%	1.3%
R43	366		10.1	376	0.1%	3.8%		16.7	382	0.1%	1.3%
R44	381		10.6	392	0.1%	3.9%		17.4	399	0.1%	1.3%
R45	381		10.5	392	0.1%	3.9%		18.5	400	0.1%	1.3%
R46	379		10.1	390	0.1%	3.9%		15.4	395	0.1%	1.3%
R47	379		11.5	391	0.1%	3.9%		16.2	396	0.1%	1.3%
R48	363		19.4	382	0.2%	3.8%		32.7	396	0.1%	1.3%
R49	363		25.7	389	0.3%	3.9%		42.3	405	0.1%	1.4%
R50	367		12.0	379	0.1%	3.8%		24.5	391	0.1%	1.3%
R51	367		11.8	378	0.1%	3.8%		30.5	397	0.1%	1.3%
R52	363		100.7	464	1.0%	4.6%		173.6	537	0.6%	1.8%
R53	367		46.6	413	0.5%	4.1%		66.3	433	0.2%	1.4%

Receptor ID	Baseline air quality level (µg/m³)	Maximum 8-hour running mean					Maximum 1-hour mean				
		EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R54	367		32.1	399	0.3%	4.0%		58.0	425	0.2%	1.4%
R55	363		132.2	495	1.3%	5.0%		187.5	551	0.6%	1.8%
R56	363		54.9	418	0.5%	4.2%		109.2	472	0.4%	1.6%

Table C-2. Results of detailed assessment at assessed human receptor locations for annual mean and 1-hour mean (99.79th percentile) NO_2 predicted concentrations

Receptor ID	Annual mean						99.79th percentile of 1-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R1	15.8	40	2.0	17.7	5.0%	44.3%	200	31.5	41.9	73.4	20.9%	36.7%
R2	15.8		1.8	17.6	4.6%	44.0%		31.5	41.5	73.0	20.8%	36.5%
R3	15.8		1.8	17.5	4.4%	43.8%		31.5	41.0	72.5	20.5%	36.2%
R4	15.8		1.4	17.2	3.6%	43.0%		31.5	32.5	64.0	16.2%	32.0%
R5	15.8		1.5	17.2	3.7%	43.0%		31.5	32.3	63.8	16.1%	31.9%
R6	15.8		1.8	17.5	4.5%	43.9%		31.5	35.8	67.3	17.9%	33.6%
R7	13.9		1.4	15.3	3.6%	38.2%		27.7	28.7	56.4	14.4%	28.2%
R8	20.4		1.3	21.8	3.3%	54.4%		40.9	25.6	66.5	12.8%	33.2%
R9	20.4		1.2	21.6	3.0%	54.1%		40.9	23.8	64.7	11.9%	32.4%
R10	20.4		1.1	21.5	2.8%	53.8%		40.9	26.5	67.4	13.3%	33.7%
R11	20.4		1.0	21.4	2.5%	53.6%		40.9	30.0	70.8	15.0%	35.4%
R12	20.4		1.0	21.4	2.4%	53.5%		40.9	31.6	72.4	15.8%	36.2%
R13	20.4		0.9	21.3	2.2%	53.3%		40.9	33.7	74.5	16.8%	37.3%
R14	20.4		0.7	21.1	1.7%	52.8%		40.9	30.9	71.8	15.4%	35.9%
R15	20.4		0.6	21.1	1.6%	52.7%		40.9	31.3	72.1	15.6%	36.1%
R16	20.4		0.5	20.9	1.2%	52.3%		40.9	27.8	68.7	13.9%	34.3%
R17	12.9		0.4	13.4	1.1%	33.4%		25.9	28.2	54.1	14.1%	27.1%

Receptor ID	Annual mean						99.79th percentile of 1-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R18	12.9		0.3	13.3	0.8%	33.2%		25.9	25.0	50.9	12.5%	25.4%
R19	12.2		0.5	12.7	1.3%	31.8%		24.4	41.1	65.5	20.6%	32.8%
R20	12.2		0.6	12.8	1.6%	32.1%		24.4	71.1	95.5	35.6%	47.8%
R21	16.5		0.7	17.3	1.8%	43.1%		33.1	56.3	89.4	28.2%	44.7%
R22	16.5		0.7	17.2	1.7%	43.0%		33.1	62.3	95.4	31.2%	47.7%
R23	16.5		0.4	17.0	1.1%	42.4%		33.1	53.4	86.5	26.7%	43.2%
R24	10.5		0.2	10.7	0.5%	26.8%		21.1	28.2	49.2	14.1%	24.6%
R25	10.5		0.2	10.7	0.5%	26.8%		21.1	26.0	47.1	13.0%	23.6%
R26	14.5		0.3	14.8	0.8%	37.1%		29.0	30.3	59.2	15.1%	29.6%
R27	7.8		0.1	7.9	0.3%	19.9%		15.7	16.4	32.1	8.2%	16.0%
R28	7.8		0.3	8.2	0.8%	20.4%		15.7	28.5	44.2	14.2%	22.1%
R29	7.0		0.1	7.1	0.2%	17.7%		14.0	22.6	36.6	11.3%	18.3%
R30	7.0		0.1	7.1	0.2%	17.7%		14.0	20.1	34.1	10.1%	17.1%
R31	7.4		0.1	7.5	0.2%	18.7%		14.8	19.5	34.3	9.7%	17.1%
R32	7.4		0.1	7.5	0.3%	18.7%		14.8	19.2	33.9	9.6%	17.0%
R33	9.7		0.2	9.9	0.5%	24.7%		19.3	23.7	43.1	11.9%	21.5%
R34	9.7		0.3	10.0	0.8%	25.0%		19.3	28.1	47.4	14.0%	23.7%
R35	18.1		1.1	19.1	2.6%	47.8%		36.1	63.2	99.4	31.6%	49.7%
R36	16.4		0.8	17.2	2.0%	43.1%		32.9	30.9	63.8	15.5%	31.9%
R37	16.4		0.4	16.9	1.0%	42.1%		32.9	27.2	60.1	13.6%	30.0%
R38	18.4		0.4	18.8	1.1%	47.1%		36.9	33.5	70.3	16.7%	35.2%
R39	18.4		0.5	18.9	1.2%	47.2%		36.9	34.6	71.4	17.3%	35.7%
R40	18.4		0.6	19.0	1.5%	47.6%		36.9	39.5	76.4	19.8%	38.2%
R41	18.4		0.6	19.1	1.6%	47.6%		36.9	38.2	75.1	19.1%	37.5%
R42	18.4		0.6	19.0	1.5%	47.5%		36.9	36.8	73.7	18.4%	36.9%
R43	18.4		0.4	18.8	0.9%	46.9%		36.9	30.9	67.7	15.4%	33.9%

Receptor ID	Annual mean						99.79th percentile of 1-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R44	14.5		0.4	14.8	0.9%	37.1%		28.9	35.6	64.5	17.8%	32.2%
R45	14.5		0.4	14.9	1.0%	37.2%		28.9	33.9	62.8	17.0%	31.4%
R46	15.8		0.9	16.6	2.1%	41.5%		31.5	36.5	68.0	18.3%	34.0%
R47	15.8		1.2	17.0	3.1%	42.5%		31.5	49.8	81.3	24.9%	40.7%
R48	11.7		2.4	14.1	6.0%	35.2%		23.4	49.8	73.2	24.9%	36.6%
R49	11.7		2.2	13.9	5.4%	34.6%		23.4	45.1	68.5	22.5%	34.2%
R50	11.7		2.7	14.4	6.6%	35.9%		23.4	67.3	90.7	33.6%	45.3%
R51	11.7		2.3	14.0	5.8%	35.1%		23.4	72.8	96.2	36.4%	48.1%
R52	11.7		7.9	19.6	19.7%	48.9%		23.4	429.6	453.0	214.8%	226.5%
R53	11.7		3.0	14.7	7.4%	36.6%		23.4	227.8	251.2	113.9%	125.6%
R54	11.7		3.7	15.4	9.1%	38.4%		23.4	152.8	176.2	76.4%	88.1%
R55	11.7		15.1	26.8	37.6%	66.9%		23.4	190.8	214.2	95.4%	107.1%
R56	11.7		6.3	18.0	15.8%	45.0%		23.4	99.5	122.9	49.8%	61.5%
GMCA AQMA'	-		4.3	-	10.8%	-	-					

Table C-3. Results of detailed assessment at assessed human receptor locations for 24-mean (99.18th percentile) and 1-hour mean (99.73rd percentile) SO_2 predicted concentrations

Receptor ID	99.18th percentile of 24-hour mean						99.73rd percentile of 1-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R1	10.1	125	0.1	10.2	0.0%	8.1%	350	10.1	0.1	10.2	0.0%	2.9%
R2	10.1		0.0	10.2	0.0%	8.1%		10.1	0.1	10.2	0.0%	2.9%
R3	10.1		0.0	10.2	0.0%	8.1%		10.1	0.1	10.2	0.0%	2.9%
R4	10.1		0.0	10.2	0.0%	8.1%		10.1	0.1	10.2	0.0%	2.9%

Receptor ID	99.18th percentile of 24-hour mean						99.73rd percentile of 1-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R5	10.1		0.0	10.2	0.0%	8.1%		10.1	0.1	10.2	0.0%	2.9%
R6	10.1		0.0	10.2	0.0%	8.1%		10.1	0.1	10.2	0.0%	2.9%
R7	10.3		0.0	10.3	0.0%	8.2%		10.3	0.1	10.3	0.0%	3.0%
R8	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.8	0.0%	4.8%
R9	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.8	0.0%	4.8%
R10	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.8	0.0%	4.8%
R11	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.8	0.0%	4.8%
R12	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.9	0.0%	4.8%
R13	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.9	0.0%	4.8%
R14	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.9	0.0%	4.8%
R15	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.8	0.0%	4.8%
R16	16.8		0.0	16.8	0.0%	13.4%		16.8	0.1	16.8	0.0%	4.8%
R17	12.2		0.0	12.2	0.0%	9.8%		12.2	0.1	12.2	0.0%	3.5%
R18	12.2		0.0	12.2	0.0%	9.8%		12.2	0.1	12.2	0.0%	3.5%
R19	10.5		0.0	10.5	0.0%	8.4%		10.5	0.1	10.6	0.0%	3.0%
R20	10.5		0.0	10.5	0.0%	8.4%		10.5	0.1	10.6	0.0%	3.0%
R21	14.3		0.1	14.3	0.0%	11.5%		14.3	0.1	14.4	0.0%	4.1%
R22	14.3		0.1	14.3	0.0%	11.5%		14.3	0.1	14.4	0.0%	4.1%
R23	14.3		0.0	14.3	0.0%	11.4%		14.3	0.1	14.4	0.0%	4.1%
R24	9.6		0.0	9.6	0.0%	7.7%		9.6	0.1	9.7	0.0%	2.8%
R25	9.6		0.0	9.6	0.0%	7.7%		9.6	0.1	9.7	0.0%	2.8%
R26	10.3		0.0	10.3	0.0%	8.2%		10.3	0.1	10.3	0.0%	2.9%
R27	9.3		0.0	9.3	0.0%	7.5%		9.3	0.0	9.4	0.0%	2.7%
R28	9.3		0.0	9.3	0.0%	7.5%		9.3	0.0	9.4	0.0%	2.7%
R29	8.9		0.0	9.0	0.0%	7.2%		8.9	0.0	9.0	0.0%	2.6%
R30	8.9		0.0	9.0	0.0%	7.2%		8.9	0.0	9.0	0.0%	2.6%

Receptor ID	99.18th percentile of 24-hour mean						99.73rd percentile of 1-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R31	9.3		0.0	9.3	0.0%	7.4%		9.3	0.0	9.3	0.0%	2.7%
R32	9.3		0.0	9.3	0.0%	7.4%		9.3	0.0	9.3	0.0%	2.7%
R33	9.8		0.0	9.8	0.0%	7.9%		9.8	0.1	9.9	0.0%	2.8%
R34	9.8		0.0	9.8	0.0%	7.9%		9.8	0.1	9.9	0.0%	2.8%
R35	10.8		0.0	10.9	0.0%	8.7%		10.8	0.1	11.0	0.0%	3.1%
R36	9.7		0.0	9.7	0.0%	7.8%		9.7	0.1	9.8	0.0%	2.8%
R37	9.7		0.0	9.7	0.0%	7.8%		9.7	0.1	9.7	0.0%	2.8%
R38	10.2		0.0	10.2	0.0%	8.1%		10.2	0.1	10.2	0.0%	2.9%
R39	10.2		0.0	10.2	0.0%	8.1%		10.2	0.1	10.2	0.0%	2.9%
R40	10.2		0.0	10.2	0.0%	8.2%		10.2	0.1	10.2	0.0%	2.9%
R41	10.2		0.0	10.2	0.0%	8.2%		10.2	0.1	10.2	0.0%	2.9%
R42	10.2		0.0	10.2	0.0%	8.2%		10.2	0.1	10.2	0.0%	2.9%
R43	10.2		0.0	10.2	0.0%	8.1%		10.2	0.1	10.2	0.0%	2.9%
R44	9.7		0.0	9.8	0.0%	7.8%		9.7	0.1	9.8	0.0%	2.8%
R45	9.7		0.0	9.8	0.0%	7.8%		9.7	0.1	9.8	0.0%	2.8%
R46	10.1		0.0	10.2	0.0%	8.1%		10.1	0.1	10.2	0.0%	2.9%
R47	10.1		0.1	10.2	0.0%	8.1%		10.1	0.1	10.2	0.0%	2.9%
R48	12.6		0.1	12.7	0.1%	10.1%		12.6	0.2	12.7	0.0%	3.6%
R49	12.6		0.0	12.6	0.0%	10.1%		12.6	0.1	12.7	0.0%	3.6%
R50	16.8		0.1	16.8	0.1%	13.5%		16.8	0.2	17.0	0.1%	4.8%
R51	16.8		0.1	16.8	0.0%	13.5%		16.8	0.2	17.0	0.1%	4.8%
R52	12.6		0.2	12.8	0.2%	10.2%		12.6	0.9	13.4	0.2%	3.8%
R53	16.8		0.1	16.9	0.1%	13.5%		16.8	0.6	17.4	0.2%	5.0%
R54	16.8		0.1	16.9	0.1%	13.5%		16.8	0.4	17.1	0.1%	4.9%
R55	12.6		0.1	12.7	0.1%	10.1%		12.6	0.2	12.8	0.1%	3.6%
R56	12.6		0.0	12.6	0.0%	10.1%		12.6	0.2	12.7	0.1%	3.6%

Table C-4. Results of detailed assessment at assessed human receptor locations for 15-minute mean (99.9th percentile) SO_2 predicted concentrations

Receptor ID	99.9th percentile of 15-minute mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R1	10.1	266	0.1	10.3	0.1%	3.9%
R2	10.1		0.1	10.2	<0.1%	3.9%
R3	10.1		0.1	10.2	<0.1%	3.9%
R4	10.1		0.1	10.2	<0.1%	3.8%
R5	10.1		0.1	10.2	<0.1%	3.8%
R6	10.1		0.1	10.2	<0.1%	3.9%
R7	10.3		0.1	10.4	<0.1%	3.9%
R8	16.8		0.1	16.9	<0.1%	6.3%
R9	16.8		0.1	16.9	<0.1%	6.3%
R10	16.8		0.1	16.9	<0.1%	6.3%
R11	16.8		0.1	16.9	<0.1%	6.3%
R12	16.8		0.1	16.9	<0.1%	6.3%
R13	16.8		0.1	16.9	<0.1%	6.4%
R14	16.8		0.1	16.9	<0.1%	6.3%
R15	16.8		0.1	16.9	<0.1%	6.3%
R16	16.8		0.1	16.9	<0.1%	6.3%
R17	12.2		0.1	12.3	<0.1%	4.6%
R18	12.2		0.1	12.3	<0.1%	4.6%
R19	10.5		0.1	10.6	0.0%	4.0%
R20	10.5		0.2	10.7	0.1%	4.0%
R21	14.3		0.2	14.5	0.1%	5.4%
R22	14.3		0.2	14.5	0.1%	5.4%
R23	14.3		0.2	14.4	0.1%	5.4%
R24	9.6		0.1	9.7	<0.1%	3.6%
R25	9.6		0.1	9.7	<0.1%	3.7%
R26	10.3		0.1	10.3	<0.1%	3.9%

Receptor ID	99.9th percentile of 15-minute mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R27	9.3		0.0	9.4	<0.1%	3.5%
R28	9.3		0.1	9.4	<0.1%	3.5%
R29	8.9		0.1	9.0	<0.1%	3.4%
R30	8.9		0.1	9.0	<0.1%	3.4%
R31	9.3		0.1	9.4	<0.1%	3.5%
R32	9.3		0.1	9.4	<0.1%	3.5%
R33	9.8		0.1	9.9	<0.1%	3.7%
R34	9.8		0.1	9.9	<0.1%	3.7%
R35	10.8		0.3	11.1	0.1%	4.2%
R36	9.7		0.1	9.8	<0.1%	3.7%
R37	9.7		0.1	9.7	<0.1%	3.7%
R38	10.2		0.1	10.3	<0.1%	3.9%
R39	10.2		0.1	10.3	<0.1%	3.9%
R40	10.2		0.1	10.3	0.1%	3.9%
R41	10.2		0.1	10.3	<0.1%	3.9%
R42	10.2		0.1	10.3	<0.1%	3.9%
R43	10.2		0.1	10.3	<0.1%	3.9%
R44	9.7		0.1	9.9	<0.1%	3.7%
R45	9.7		0.1	9.8	<0.1%	3.7%
R46	10.1		0.1	10.2	0.0%	3.8%
R47	10.1		0.2	10.3	0.1%	3.9%
R48	12.6		0.2	12.7	0.1%	4.8%
R49	12.6		0.1	12.7	0.0%	4.8%
R50	16.8		0.3	17.1	0.1%	6.4%
R51	16.8		0.3	17.1	0.1%	6.4%
R52	12.6		1.2	13.8	0.5%	5.2%
R53	16.8		0.7	17.5	0.3%	6.6%

Receptor ID	99.9th percentile of 15-minute mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R54	16.8		0.6	17.3	0.2%	6.5%
R55	12.6		0.3	12.9	0.1%	4.8%
R56	12.6		0.3	12.9	0.1%	4.8%

Table C-5. Results of detailed assessment at assessed human receptor locations for annual mean and 24-hour mean (90.41st) percentile) PM_{10} predicted concentrations

Receptor ID	Annual mean						90.41st percentile of 24-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R1	13.5	40	0.01	13.5	0.03%	33.9%	50	27.1	0.7	27.8	1.4%	55.6%
R2	13.5		0.01	13.5	0.03%	33.9%		27.1	0.6	27.7	1.3%	55.4%
R3	13.5		0.01	13.5	0.03%	33.9%		27.1	0.6	27.7	1.2%	55.4%
R4	13.5		0.01	13.5	0.02%	33.9%		27.1	0.5	27.6	1.0%	55.1%
R5	13.5		0.01	13.5	0.02%	33.9%		27.1	0.5	27.5	0.9%	55.1%
R6	13.5		0.01	13.5	0.02%	33.9%		27.1	0.5	27.6	1.0%	55.2%
R7	11.5		0.01	11.5	0.01%	28.7%		23.0	0.4	23.3	0.8%	46.7%
R8	11.1		0.01	11.1	0.01%	27.7%		22.1	0.4	22.5	0.7%	45.0%
R9	11.1		0.00	11.1	0.01%	27.7%		22.1	0.3	22.5	0.7%	44.9%
R10	11.1		0.00	11.1	0.01%	27.7%		22.1	0.3	22.4	0.6%	44.9%
R11	11.1		0.00	11.1	0.01%	27.7%		22.1	0.3	22.4	0.6%	44.9%
R12	11.1		0.00	11.1	0.01%	27.7%		22.1	0.3	22.4	0.6%	44.9%
R13	11.1		0.00	11.1	0.01%	27.7%		22.1	0.3	22.4	0.6%	44.9%
R14	11.1		0.00	11.1	0.01%	27.7%		22.1	0.3	22.4	0.6%	44.8%
R15	11.1		0.00	11.1	0.01%	27.7%		22.1	0.3	22.4	0.6%	44.8%
R16	11.1		0.00	11.1	0.01%	27.7%		22.1	0.2	22.4	0.5%	44.7%
R17	10.7		0.00	10.7	0.01%	26.8%		21.4	0.2	21.6	0.4%	43.2%

Receptor ID	Annual mean						90.41st percentile of 24-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R18	10.7		0.00	10.7	0.01%	26.8%		21.4	0.2	21.6	0.4%	43.2%
R19	10.2		0.00	10.2	0.01%	25.5%		20.4	0.3	20.8	0.7%	41.5%
R20	10.2		0.01	10.2	0.01%	25.6%		20.4	0.6	21.0	1.1%	42.0%
R21	10.6		0.01	10.6	0.02%	26.5%		21.2	0.9	22.1	1.7%	44.1%
R22	10.6		0.01	10.6	0.02%	26.5%		21.2	0.7	22.0	1.5%	43.9%
R23	10.6		0.00	10.6	0.01%	26.5%		21.2	0.3	21.5	0.6%	43.0%
R24	10.2		0.00	10.2	0.00%	25.6%		20.5	0.1	20.6	0.3%	41.3%
R25	10.2		0.00	10.2	0.00%	25.6%		20.5	0.1	20.6	0.3%	41.3%
R26	10.6		0.01	10.6	0.02%	26.4%		21.1	0.8	21.9	1.6%	43.8%
R27	10.5		0.00	10.5	0.00%	26.3%		21.0	0.1	21.2	0.3%	42.3%
R28	10.5		0.01	10.5	0.02%	26.3%		21.0	0.8	21.8	1.5%	43.6%
R29	10.3		0.00	10.3	0.00%	25.7%		20.5	0.2	20.7	0.4%	41.4%
R30	10.3		0.00	10.3	0.00%	25.7%		20.5	0.2	20.7	0.3%	41.4%
R31	10.3		0.00	10.3	0.00%	25.7%		20.5	0.1	20.7	0.3%	41.4%
R32	10.3		0.00	10.3	0.00%	25.7%		20.5	0.2	20.7	0.3%	41.4%
R33	10.5		0.00	10.5	0.01%	26.3%		21.0	0.2	21.2	0.4%	42.4%
R34	10.5		0.00	10.5	0.01%	26.3%		21.0	0.4	21.4	0.7%	42.8%
R35	10.9		0.00	10.9	0.01%	27.3%		21.8	0.4	22.2	0.8%	44.4%
R36	11.7		0.00	11.7	0.01%	29.2%		23.3	0.4	23.7	0.8%	47.4%
R37	11.7		0.00	11.7	0.01%	29.2%		23.3	0.2	23.6	0.5%	47.1%
R38	12.9		0.00	12.9	0.01%	32.3%		25.8	0.3	26.1	0.5%	52.2%
R39	12.9		0.00	12.9	0.01%	32.3%		25.8	0.3	26.1	0.6%	52.2%
R40	12.9		0.00	12.9	0.01%	32.3%		25.8	0.3	26.1	0.6%	52.3%
R41	12.9		0.00	12.9	0.01%	32.3%		25.8	0.3	26.2	0.7%	52.3%
R42	12.9		0.00	12.9	0.01%	32.3%		25.8	0.4	26.2	0.7%	52.4%

Receptor ID	Annual mean						90.41st percentile of 24-hour mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)	EQS (µg/m³)	Baseline air quality level (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R43	12.9		0.00	12.9	0.01%	32.3%		25.8	0.2	26.1	0.5%	52.1%
R44	12.9		0.00	13.0	0.01%	32.4%		25.9	0.2	26.1	0.5%	52.3%
R45	12.9		0.00	13.0	0.01%	32.4%		25.9	0.3	26.2	0.5%	52.3%
R46	13.5		0.01	13.5	0.01%	33.9%		27.1	0.4	27.5	0.8%	55.0%
R47	13.5		0.01	13.5	0.02%	33.9%		27.1	0.6	27.7	1.2%	55.4%
R48	11.2		0.01	11.2	0.03%	28.0%		22.3	0.9	23.2	1.8%	46.5%
R49	11.2		0.01	11.2	0.02%	27.9%		22.3	0.5	22.8	0.9%	45.6%
R50	11.1		0.01	11.1	0.03%	27.7%		22.1	0.6	22.8	1.3%	45.6%
R51	11.1		0.01	11.1	0.03%	27.7%		22.1	0.6	22.8	1.3%	45.5%
R52	11.2		0.04	11.2	0.11%	28.0%		22.3	3.3	25.6	6.5%	51.2%
R53	11.1		0.01	11.1	0.04%	27.7%		22.1	1.0	23.2	2.0%	46.3%
R54	11.1		0.02	11.1	0.04%	27.7%		22.1	1.2	23.3	2.3%	46.6%
R55	11.2		0.01	11.2	0.03%	28.0%		22.3	0.9	23.2	1.8%	46.5%
R56	11.2		0.01	11.2	0.02%	28.0%		22.3	0.5	22.9	1.0%	45.7%
GMCA AQMA	-							-	7.9	-	15.8%	-

Table C-6. Results of detailed assessment at assessed human receptor locations for annual mean $PM_{2.5}$ predicted concentrations

Receptor ID	Annual mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R1	7.2	20	0.01	7.2	0.1%	36.0%
R2	7.2		0.01	7.2	0.1%	36.0%
R3	7.2		0.01	7.2	0.1%	36.0%
R4	7.2		0.01	7.2	<0.1%	35.9%
R5	7.2		0.01	7.2	<0.1%	35.9%
R6	7.2		0.01	7.2	<0.1%	35.9%
R7	7.0		0.01	7.0	<0.1%	35.0%
R8	6.8		0.01	6.8	<0.1%	33.8%
R9	6.8		0.00	6.8	<0.1%	33.8%
R10	6.8		0.00	6.8	<0.1%	33.8%
R11	6.8		0.00	6.8	<0.1%	33.8%
R12	6.8		0.00	6.8	<0.1%	33.8%
R13	6.8		0.00	6.8	<0.1%	33.8%
R14	6.8		0.00	6.8	<0.1%	33.8%
R15	6.8		0.00	6.8	<0.1%	33.8%
R16	6.8		0.00	6.8	<0.1%	33.8%
R17	6.6		0.00	6.6	<0.1%	32.9%
R18	6.6		0.00	6.6	<0.1%	32.9%
R19	6.3		0.00	6.3	<0.1%	31.5%
R20	6.3		0.01	6.3	<0.1%	31.5%
R21	6.4		0.01	6.4	<0.1%	31.9%
R22	6.4		0.01	6.4	<0.1%	31.9%
R23	6.4		0.00	6.4	<0.1%	31.8%
R24	6.1		0.00	6.1	<0.1%	30.7%
R25	6.1		0.00	6.1	<0.1%	30.7%
R26	6.2		0.01	6.2	<0.1%	31.1%

Receptor ID	Annual mean					
	Baseline air quality level (µg/m³)	EQS (µg/m³)	PC (µg/m³)	PEC (µg/m³)	PC/EQS (%)	PEC/EQS (%)
R27	6.0		0.00	6.0	<0.1%	30.0%
R28	6.0		0.01	6.0	<0.1%	30.1%
R29	5.9		0.00	5.9	<0.1%	29.5%
R30	5.9		0.00	5.9	<0.1%	29.5%
R31	5.9		0.00	5.9	<0.1%	29.4%
R32	5.9		0.00	5.9	<0.1%	29.4%
R33	6.1		0.00	6.1	<0.1%	30.5%
R34	6.1		0.00	6.1	<0.1%	30.5%
R35	6.4		0.00	6.5	<0.1%	32.3%
R36	6.5		0.00	6.5	<0.1%	32.5%
R37	6.5		0.00	6.5	<0.1%	32.5%
R38	6.8		0.00	6.8	<0.1%	34.0%
R39	6.8		0.00	6.8	<0.1%	34.0%
R40	6.8		0.00	6.8	<0.1%	34.0%
R41	6.8		0.00	6.8	<0.1%	34.0%
R42	6.8		0.00	6.8	<0.1%	34.0%
R43	6.8		0.00	6.8	<0.1%	34.0%
R44	6.9		0.00	6.9	<0.1%	34.3%
R45	6.9		0.00	6.9	<0.1%	34.3%
R46	7.2		0.01	7.2	<0.1%	35.9%
R47	7.2		0.01	7.2	<0.1%	35.9%
R48	6.6		0.01	6.6	0.1%	33.1%
R49	6.6		0.01	6.6	<0.1%	33.1%
R50	6.8		0.01	6.8	0.1%	33.8%
R51	6.8		0.01	6.8	0.1%	33.8%
R52	6.6		0.04	6.7	0.2%	33.3%
R53	6.8		0.01	6.8	0.1%	33.9%

Receptor ID	Annual mean					
	Baseline air quality level ($\mu g/m^3$)	EQS ($\mu g/m^3$)	PC ($\mu g/m^3$)	PEC ($\mu g/m^3$)	PC/EQS (%)	PEC/EQS (%)
R54	6.8		0.02	6.8	0.1%	33.9%
R55	6.6		0.01	6.6	0.1%	33.1%
R56	6.6		0.01	6.6	0.0%	33.1%