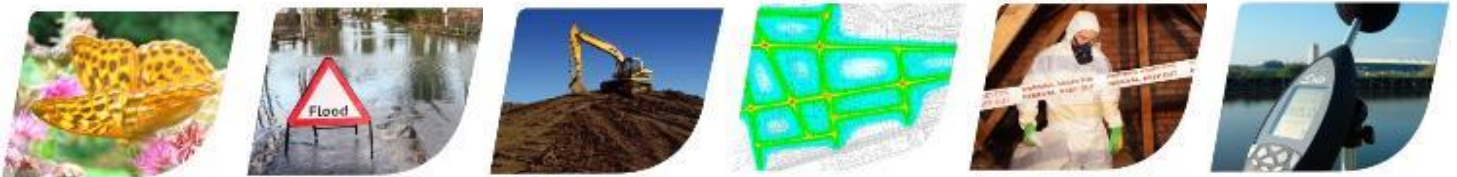


AIR QUALITY ASSESSMENT ABACUS BELSIZE PRIMARY SCHOOL

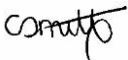


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EXECUTIVE SUMMARY

Resource and Environmental Consultants Ltd was commissioned by Kier Construction Ltd to undertake an Air Quality Assessment in support of the proposed Abacus Belsize Primary School, London.

The proposals comprise the redevelopment of the former metropolitan police station site at Rosslyn Hill, London. The site is located within an area identified as experiencing elevated pollutant concentrations by the London Borough of Camden, similar to many of the London boroughs. As such, the development has the potential to expose future users to poor air quality. An Air Quality Assessment was therefore required in order to determine baseline conditions, consider site suitability for the proposed end-use and identify suitable mitigation measures as required.

Dispersion modelling was undertaken in order to predict pollutant concentrations across the proposed development site as a result of emissions from the local highway network. The results indicated that pollution concentrations were considered acceptable at ground floor level without the inclusion of mitigation measures.

Based on the assessment results, air quality issues are not considered a constraint to planning consent for the proposed development, subject to the inclusion of relevant mitigation measures.

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INTRODUCTION

1.1 Background

Resource and Environmental Consultants (REC) Ltd was commissioned by Kier Construction Ltd to undertake an Air Quality Assessment in support of the proposed Abacus Belsize Primary School, London.

The site is located in an area identified by the London Borough of Camden (LBoC) as experiencing elevated pollutant concentrations and subsequently there are concerns that the proposals will introduce future users to poor air quality. As such, an Air Quality Assessment was required to quantify pollutant concentrations across the site.

1.2 Site Location and Context

The site is located at Rossllyn Hill, London at National Grid Reference (NGR): 526870, 185560. Reference should be made to Figure 1 for a location plan.

The proposals comprise the redevelopment of the former metropolitan police station. The development is located within LBoC's Air Quality Management Area (AQMA), which has been declared due to exceedances of the annual mean Air Quality Objectives (AQOs) for nitrogen dioxide (NO₂) and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀). As such, there is the potential for future users to be exposed to high pollution levels at the site. An Air Quality Assessment was therefore required to determine baseline conditions and consider suitability for the proposed end-use.

1.3 Limitations

This report has been produced in accordance with REC's standard terms of engagement. REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.

2.0 LEGISLATION AND POLICY

2.1 European Legislation

European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5}). The consolidated Directives include:

- Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for NO₂, oxides of nitrogen (NO_x), sulphur dioxide, lead and PM₁₀;
- Directive 2000/69/EC - the Second Air Quality "Daughter" Directive - sets ambient AQLVs for benzene and carbon monoxide; and,
- Directive 2002/3/EC - the Third Air Quality "Daughter" Directive - seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

The fourth daughter Directive was not included within the consolidation and is described as:

- Directive 2004/107/EC - sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

2.2 UK Legislation

The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Target Values for an additional 5 pollutants.

Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out AQOs that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

Table 1 presents the AQOs for pollutants considered within this assessment.

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
NO ₂	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM ₁₀	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year

Table 2 summarises the advice provided in DEFRA guidance LAQM.TG(09)² on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

² Local Air Quality Management Technical Guidance LAQM.TG(09), DEFRA, 2009.

2.3 Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.4 National Planning Policy

2.4.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)³ was published on 27th March 2012 and sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to this assessment:

"The planning system should contribute to and enhance the natural and local environment by:
[...]

Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability"

"Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."

The implications of the NPPF have been considered throughout this assessment.

2.4.2 National Planning Practice Guidance

The National Planning Practice Guidance (NPPG)⁴ web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

1. Why should planning be concerned about air quality?
2. What is the role of Local Plans with regard to air quality?
3. Are air quality concerns relevant to neighbourhood planning?
4. What information is available about air quality?
5. When could air quality be relevant to a planning decision?

³ National Planning Policy Framework, Department for Communities and Local Government, 2012.

⁴ <http://planningguidance.planningportal.gov.uk>.

6. Where to start if bringing forward a proposal where air quality could be a concern?
7. How detailed does an air quality assessment need to be?
8. How can an impact on air quality be mitigated?
9. How do considerations about air quality fit into the development management process?

These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.5 Local Planning Policy

2.5.1 The London Plan

The Further Alterations To The London Plan⁵ was published in March 2015 and sets out a fully integrated economic, environmental, transport and social framework for the development of the capital until 2031. London boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.

The London Plan policies relating to air quality are outlined below:

"Policy 5.3 - Sustainable design and construction

Strategic

- The highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime.

Planning decisions

- Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process.
- Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles:
 - [...]
 - Minimising pollution (including noise, air and urban run-off)
 - [...]"

"Policy 7.14 - Improving air quality

Strategic

- The Mayor recognises the importance of tackling air pollution and improving air

⁵ The London Plan, Further Alterations To The London, Greater London Authority, 2015.

quality to London's development and the health and well-being of its people. He will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of his Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimise public exposure to pollution.

Planning decisions

Development proposals should:

- Minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (see Policy 6.3).
- Promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Council's 'The control of dust and emissions from construction and demolition'.
- Be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs)).
- Ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches."

These policies have been considered throughout the completion of this Air Quality Assessment.

2.5.2 London Borough of Camden Development Policies

The Development Policies were adopted by the LBoC on 8th November 2010. The Development Policies set out LBoC's planning policies and is used to guide, assess and determine planning applications.

A review of the Local Plan indicated the following policy in relation to air quality:

"Policy DP32

Air Quality and Camden's Clear Zone

The Council will require air quality assessments where development could potentially cause significant harm to air quality. Mitigation measures will be expected in developments that are located in areas of poor air quality.

The Council will only grant planning permission for development in the Clear Zone region

that significantly increases travel demand where it considers that appropriate measures to minimise the transport impact of development are incorporated. We will use planning conditions and legal agreements to secure Clear Zone measures to avoid, remedy or mitigate the impacts of development schemes in the Central London Area."

The implication of this policy has been considered throughout this assessment by defining existing air quality at the proposed development site.

3.0 BASELINE

Existing air quality conditions in the vicinity of the proposed site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

3.1 Local Air Quality Management

As required by the Environment Act (1995), LBoC has undertaken Review and Assessment of air quality within their administrative area. This process has indicated that concentrations of NO₂ and PM₁₀ are above the AQOs within the borough. As such, an AQMA has been declared, which is described as:

"London Borough of Camden AQMA - The whole borough"

The development site is located within the AQMA which has been declared for exceedances of the annual mean NO₂ AQO and the 24-hour mean PM₁₀ AQO. This has been considered within this assessment.

LBoC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated.

3.2 Air Quality Monitoring

LBoC monitors pollutant concentrations using continuous and periodic methods throughout their area of administration. The closest roadside automatic monitor to the development is located at Swiss Cottage, approximately 1.2km south west of the site. Monitoring results from 2013, 2014 and 2015 were obtained from the UK Air website⁶ are shown in Table 3. Exceedences of the relevant AQO are highlighted in **bold**.

Table 3 Automatic Monitoring Results

Site	Type	NGR (m)		Annual Mean Pollutant Concentration (µg/m ³)					
				2013		2014		2015	
		X	Y	NO ₂	PM ₁₀	NO ₂	PM ₁₀	NO ₂	PM ₁₀
Swiss Cottage	Kerbside	526633	184392	71	20	66	22	61*	20*

Note: *Partially provisional dataset

As indicated in Table 3, the annual mean AQO for NO₂ was exceeded at the Swiss Cottage site in recent years. This is to be expected due to its roadside location within an AQMA. The annual mean PM₁₀ concentration was below the relevant AQO at this site.

LBoC also undertakes NO₂ diffusion tube monitoring at various locations within the borough. The closest diffusion tube is located approximately 1.2km south west of the proposed development. Recent results for this monitoring location are shown in Table .

⁶ http://uk-air.defra.gov.uk/data/flat_files?site_id=CA1

Table 4 Diffusion Tube Monitoring Results

Site Name		Type	Annual Mean NO ₂ Concentration (µg/m ³)	
			2012	2013
CA15	Swiss Cottage/ Finchley Road	Kerbside	72.66	83.08

As indicated in Table , the annual mean AQO for NO₂ was exceeded at CA15 in recent years.

3.3 Background Pollutant Concentrations

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 526500, 185500. Data for this location was downloaded from the DEFRA website⁷ for the purpose of this assessment and is summarised in Table 5.

Table 5 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m ³)	
	2014	2017
NO _x	49.96	44.61
NO ₂	31.02	28.15
PM ₁₀	21.85	21.14

As shown in Table 5, background concentrations of NO₂ do not exceed the relevant AQOs. Comparison with the monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at roadside locations.

⁷ <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>.

4.0 METHODOLOGY

The proposed development has the potential to expose new site users to elevated pollutant levels. In order to assess NO₂ and PM₁₀ concentrations across the site, detailed dispersion modelling was undertaken in accordance with the following methodology.

Assessment inputs are described in the following subsections.

4.1 Dispersion Model

Dispersion modelling was undertaken using the ADMS Roads dispersion model (version 4.0). ADMS Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

4.2 Input Data

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length; and,
- Monin-Obukhov length.

4.2.1 Assessment Area

Ambient concentrations were predicted over the area NGR: 526800, 185470 to 526950, 185620. A Cartesian grid was utilised within the model to produce data suitable for contour plotting using the Surfer software package. Reference should be made to Figure 2 for a graphical representation of the assessment grid extents.

4.2.2 Traffic Flow Data

Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition, was obtained from the London Atmospheric Emissions Inventory (LAEI). The LAEI (2010) was released by the Greater London Authority (GLA) in 2013 and provides information on emissions from all sources of air pollutants in the Greater London area. Vehicle speeds were estimated based on the free flow potential of each link and local speed limits. Road widths were estimated from aerial photography and UK highway design standards.

Growth factors provided by the TEMPRO (Trip End Model Presentation Program) software package were utilised to allow for conversion from the downloaded traffic flow year of 2015 to 2017, which represents the development opening year.

A summary of the 2017 traffic data used in the assessment is provided in Table 6.

Table 6 2017 Traffic Data

Road Link		Road Width (m)	24-hour AADT Flow	HDV %	Mean Vehicle Speed (km/h)
1	A502 (West of Downshire Hill)	6.5	16214	5.7	32
2	Downshire Hill Slow Down Section	7.0	8107	5.7	25
3	Downshire Hill	5.0	8107	5.7	32
4	A502 (East of Downshire Hill)	12.0	16214	5.7	32

4.2.3 Road Traffic Emission Factors

Emission factors for each road link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 6.0.2), which incorporates updated vehicle emissions factors for NO_x and vehicle fleet information.

There is current uncertainty over NO₂ concentrations within the UK, with roadside levels not reducing as previously expected due to the implementation of new vehicle emission standards. Therefore, 2014 emission factors have been utilised for the prediction of pollution levels for all scenarios in preference to the development opening year in order to provide a robust assessment.

4.2.4 Meteorological Data

Meteorological data used in the assessment was taken from London City Airport Meteorological Station over the period 1st January 2014 to 31st December 2014 (inclusive). London City Airport Meteorological Station is located at NGR: 542998, 180430, which is approximately 16.3km south-east of the proposed development. DEFRA guidance LAQM.TG(09)⁸ recommends meteorological stations within 30km of an assessment area as being suitable for detailed modelling.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 3 for a wind rose of utilised meteorological data.

4.2.5 Roughness Length

A roughness length (z_0) of 1m was used in the dispersion modelling study. This value of z_0 is considered appropriate for the morphology of the assessment area and is suggested within ADMS-Roads as being suitable for 'cities and woodlands'.

A z_0 of 0.2m was utilised to represent the morphology of the meteorological station and is suggested as being suitable for 'agricultural areas (min)'.

⁸ Local Air Quality Management Technical Guidance LAQM.TG(09), DEFRA, 2009.

4.2.6 Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 100m was used in this dispersion modelling study. This value is considered appropriate for the nature of the assessment area and meteorological station and is suggested within ADMS-Roads as being suitable for 'large conurbations > 1 million'.

4.2.7 Background Concentrations

An annual mean NO₂ concentration of 31.02µg/m³ and PM₁₀ concentration of 21.85µg/m³, as predicted by DEFRA, was used to represent background levels in the vicinity of the site.

Similarly to emission factors, background concentrations for 2014 were utilised in preference to the development opening year. This provided a robust assessment and is likely to overestimate actual pollutant concentrations during the operation of the proposals.

4.2.8 NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations from the dispersion model were converted to NO₂ concentrations using the spreadsheet provided by DEFRA, which is the method detailed within LAQM.TG(09)⁹.

4.3 Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects. This requires available monitoring records from a site within assessment extents. The review of baseline air quality undertaken for the purpose of this assessment indicated that sufficient pollution monitoring is not currently undertaken by LBoC in the vicinity of the proposed development site. As such, suitable data for verification purposes was not available and all predicted concentrations are therefore unverified.

It is considered the use of unverified results has not significantly affected the outcomes of this assessment as the latest sources of input data were utilised where available, including the following:

- Traffic data obtained from the LAEI;

⁹ Local Air Quality Management Technical Guidance LAQM.TG(09), DEFRA, 2009

- Emissions Factor Toolkit (version 6.0.2) released in November 2014, which incorporates updated NO_x emission factors and vehicle fleet information;
- 2014 emission factors were utilised rather than the opening year of 2017. As emissions are predicted to reduce in future years, this was considered to provide a robust assessment; and
- Use of 2014 background concentrations.

Based on the above, the use of unverified results is considered to be valid in the context of this assessment.

5.0 ASSESSMENT

During the operational phase of the proposed development there is the potential for future site users to be exposed to elevated pollutant concentrations. This has been assessed through dispersion modelling, with the results presented in the following Sections.

5.1 Nitrogen Dioxide

Predicted annual mean NO₂ concentrations at ground and first floor levels across the proposed development site during 2017 are summarised in Table 7.

Table 7 Modelling Results - NO₂

Floor	Predicted 2017 Annual Mean NO ₂ Concentration Range (µg/m ³)
Ground Floor	32.43 – 36.08

Figure 4 displays contour plots for predicted annual mean NO₂ concentrations across the site at a height representative of the ground floor. This indicates that there were no predicted exceedences of the AQO throughout the modelling area. It is therefore considered that NO₂ levels at the development should not be viewed as a constraint to development.

5.2 Particulate Matter

Predicted annual mean PM₁₀ concentrations at ground floor level on the proposed development site during 2017 are summarised in Table 8.

Table 8 Modelling Results - PM₁₀

Residential Floor	Predicted 2017 Annual Mean PM ₁₀ Concentration Range (µg/m ³)
Ground Floor	21.66 – 22.24

Figure 5 displays the contour plot for predicted annual mean PM₁₀ concentrations across the development at a height representative of the ground floor. This indicates that there were no predicted exceedences of the AQO throughout the modelling area. It is therefore considered that PM₁₀ levels at the development should not be viewed as a constraint to development.

It should be noted that Figures showing predicted annual mean NO₂ and PM₁₀ concentrations at heights above the ground floor were not included as concentrations reduce at increased heights and therefore the relevant AQO will not be exceeded at other levels.

6.0 CONCLUSION

REC Ltd was commissioned by Kier Construction Ltd to undertake an Air Quality Assessment in support of the proposed Abacus Belsize Primary School, London.

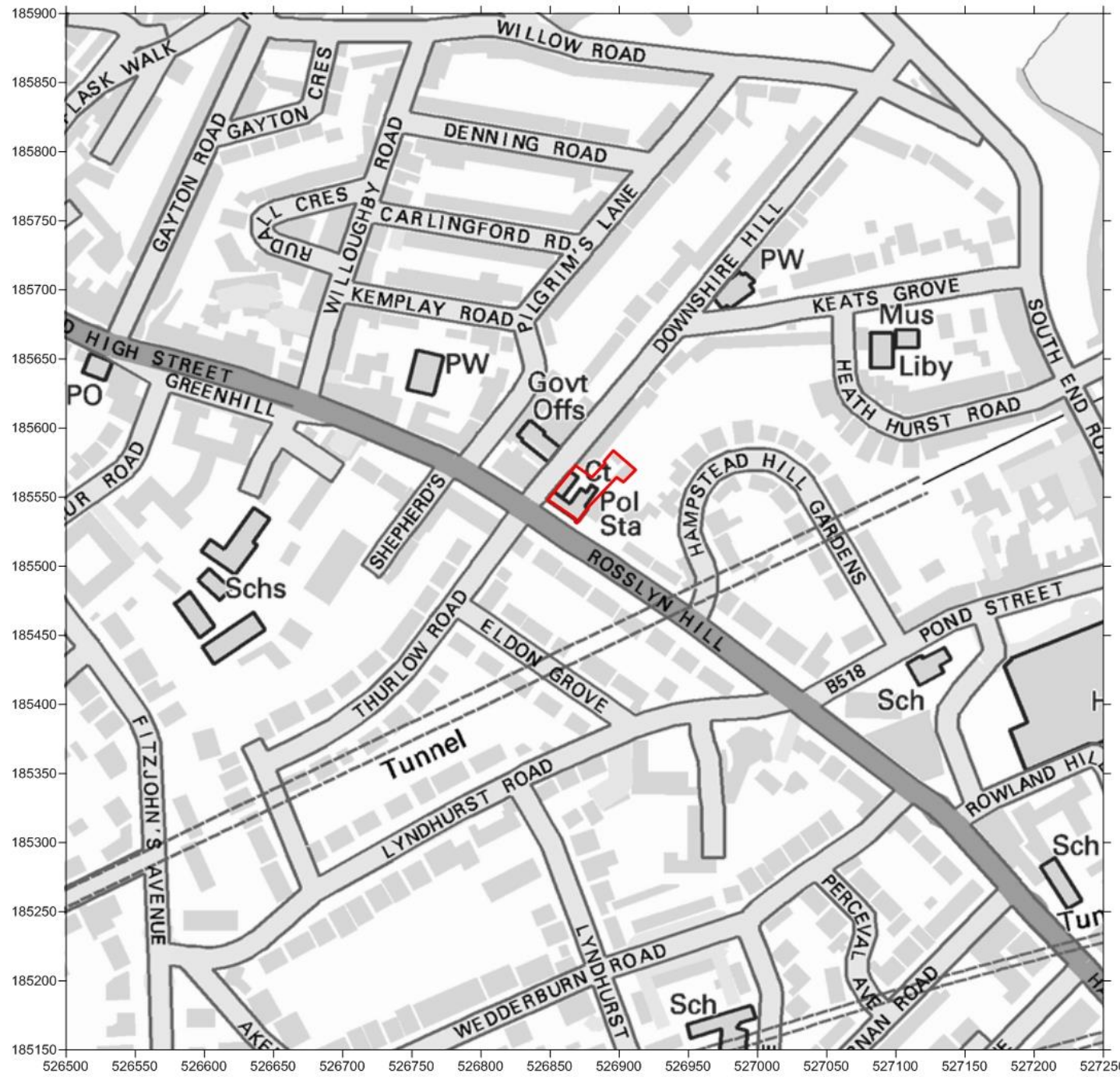
The proposals comprise the redevelopment of the former metropolitan police station at Rosslyn Hill, London. The site is located within an area identified as experiencing elevated pollutant concentrations by the LBoC, similar to many of the London boroughs. As such, the development has the potential to expose future users to poor air quality. An Air Quality Assessment was therefore required in order to determine baseline conditions and consider site suitability for the proposed end-use.

Dispersion modelling was undertaken in order to quantify pollutant concentrations at the site. Concentrations of NO₂ and PM₁₀ were predicted at various floor heights across the development. This indicated that annual mean NO₂ and PM₁₀ concentrations were below the relevant AQOs at ground floor level.

Based on the assessment results, air quality issues are not considered a constraint to planning consent for the proposed development.

7.0 ABBREVIATIONS

AA DT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
APPLE	Air Pollution Planning and the Local Environment
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
EPUK	Environmental Protection UK
EU	European Union
GLA	Greater London Authority
H DV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LA	Local Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBoC	London Borough of Camden
LDF	Local Development Framework
LGV	Light Duty Vehicle
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
REC	Resource and Environmental Consultants
TEMPRO	Trip End Model Presentation Program
z ₀	Roughness Length



Legend



Title
Figure 1
Site Location

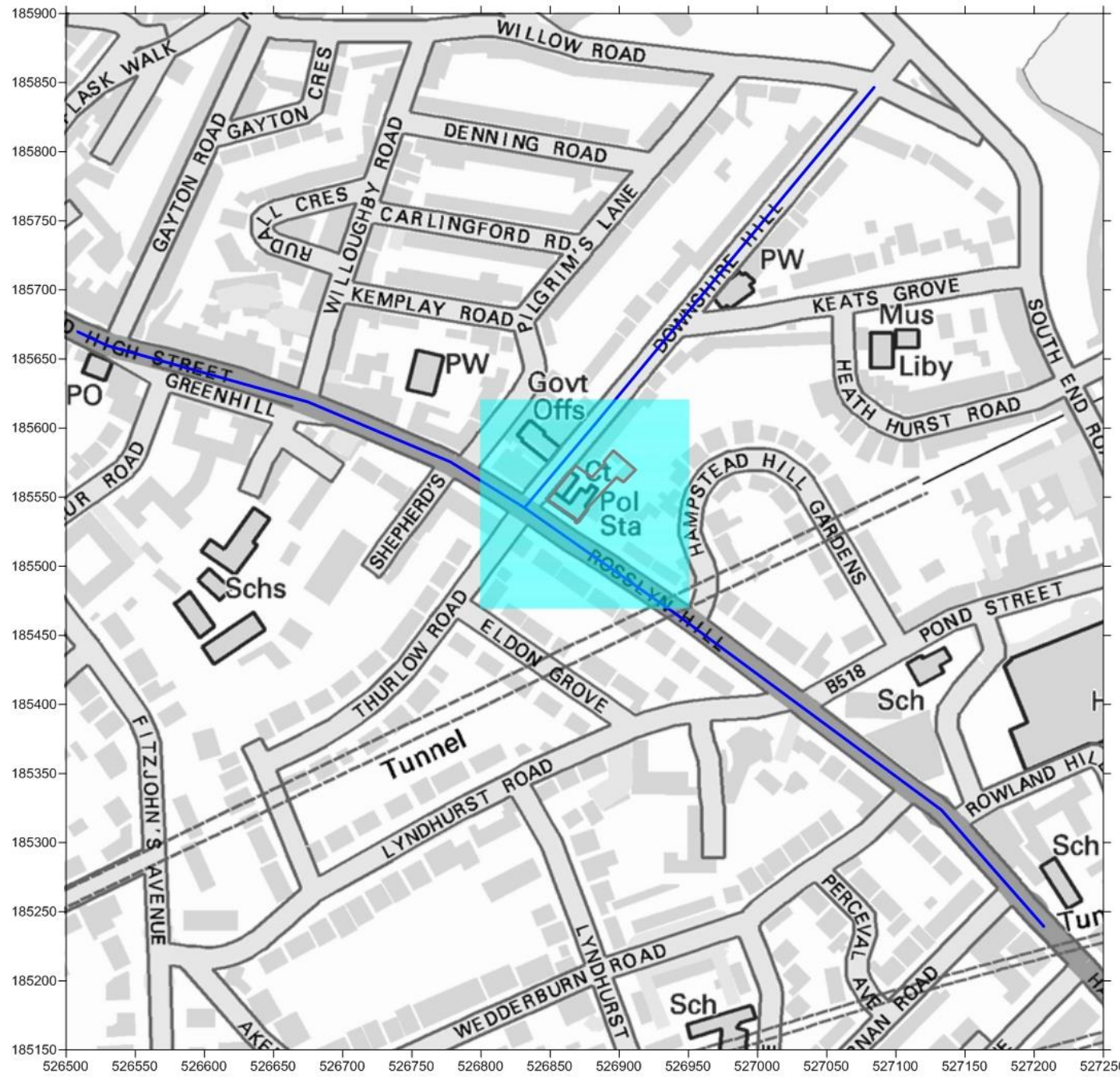
Project
Air Quality Assessment
Abacus Belsize Primary School

Project Number
AQ101271




Client
Kier Construction Ltd

Contains Ordnance Survey Data
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Legend

-  Site Boundary
-  Modelled Road Link
-  Cartesian Grid

Title
Figure 2
ADMS-Roads Input

Project
Air Quality Assessment
Abacus Belsize Primary School

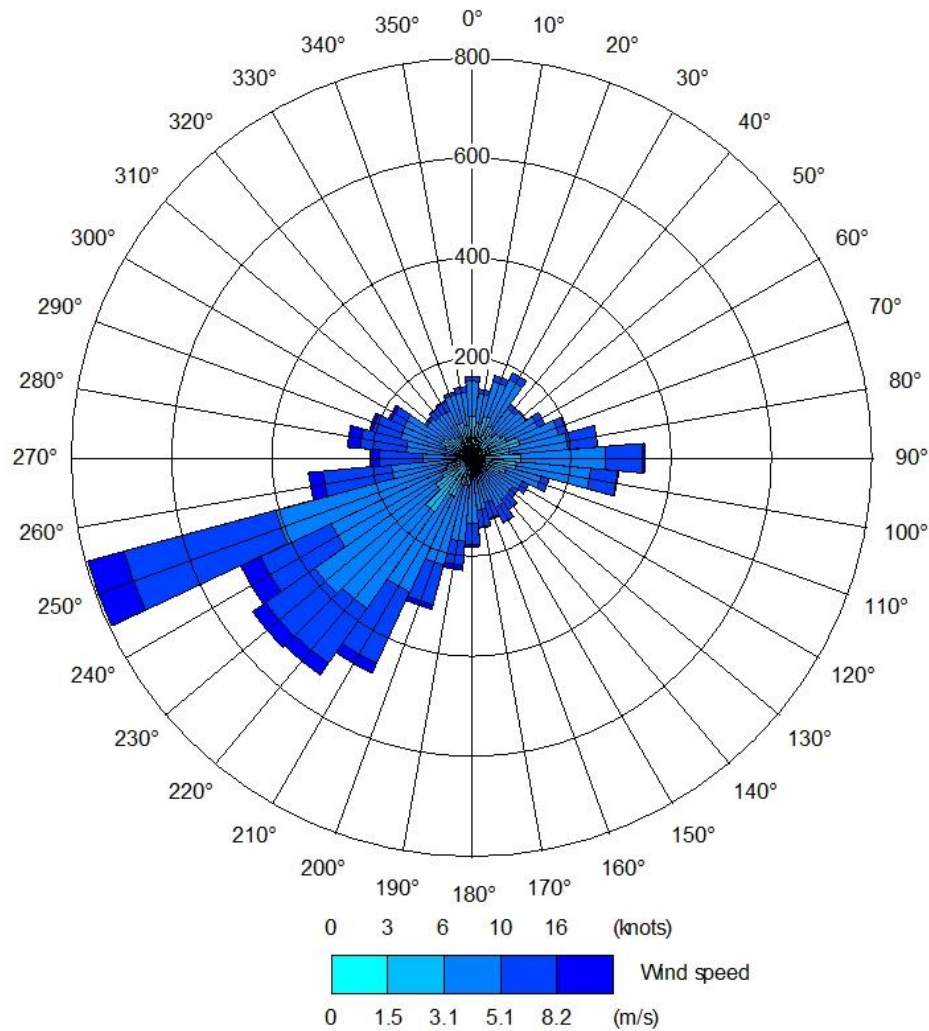
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Legend

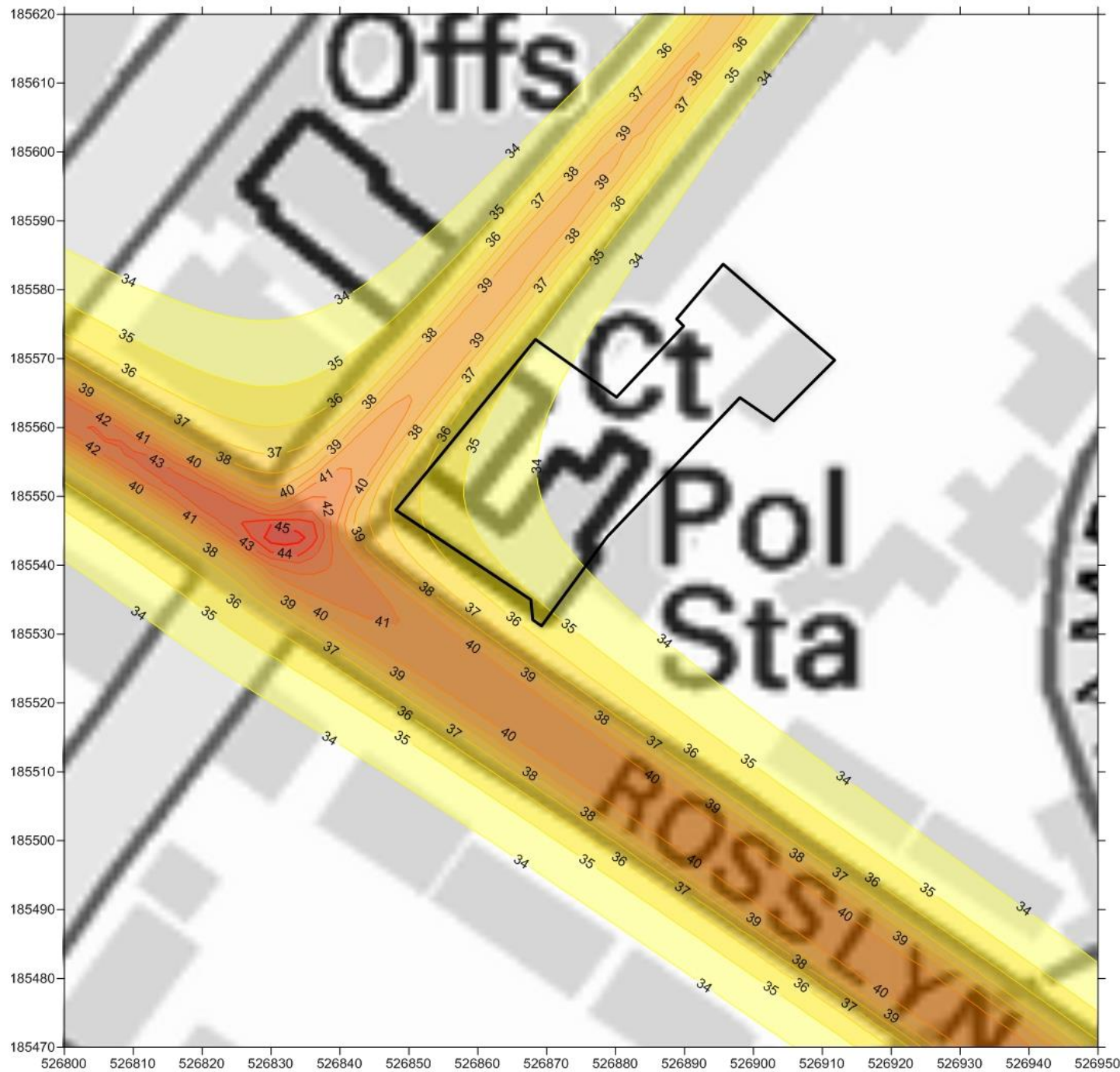
Title
Figure 3
Wind Rose of 2014 London City Airport
Meteorological Data

Project
Air Quality Assessment
Abacus Belsize Primary School

Project Number
AQ101271

Client
Kier Construction Ltd

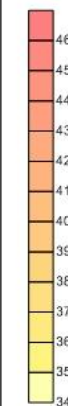
REC 
Resource & Environmental Consultants Ltd
Resource and Environmental Consultants Ltd
Osprey House, Broadway, Manchester M50 2UE
Tel – 0161 868 1300 Fax – 0161 868 1301
www.recltd.co.uk



Legend



Site Boundary



Predicted Annual Mean
NO₂ Concentration (µg/m³)

Title

Figure 4
Predicted Annual Mean NO₂
Concentrations (µg/m³) 2017
z = 1.5m

Project

Air Quality Assessment
Abacus Belsize Primary School

Project Number

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Client

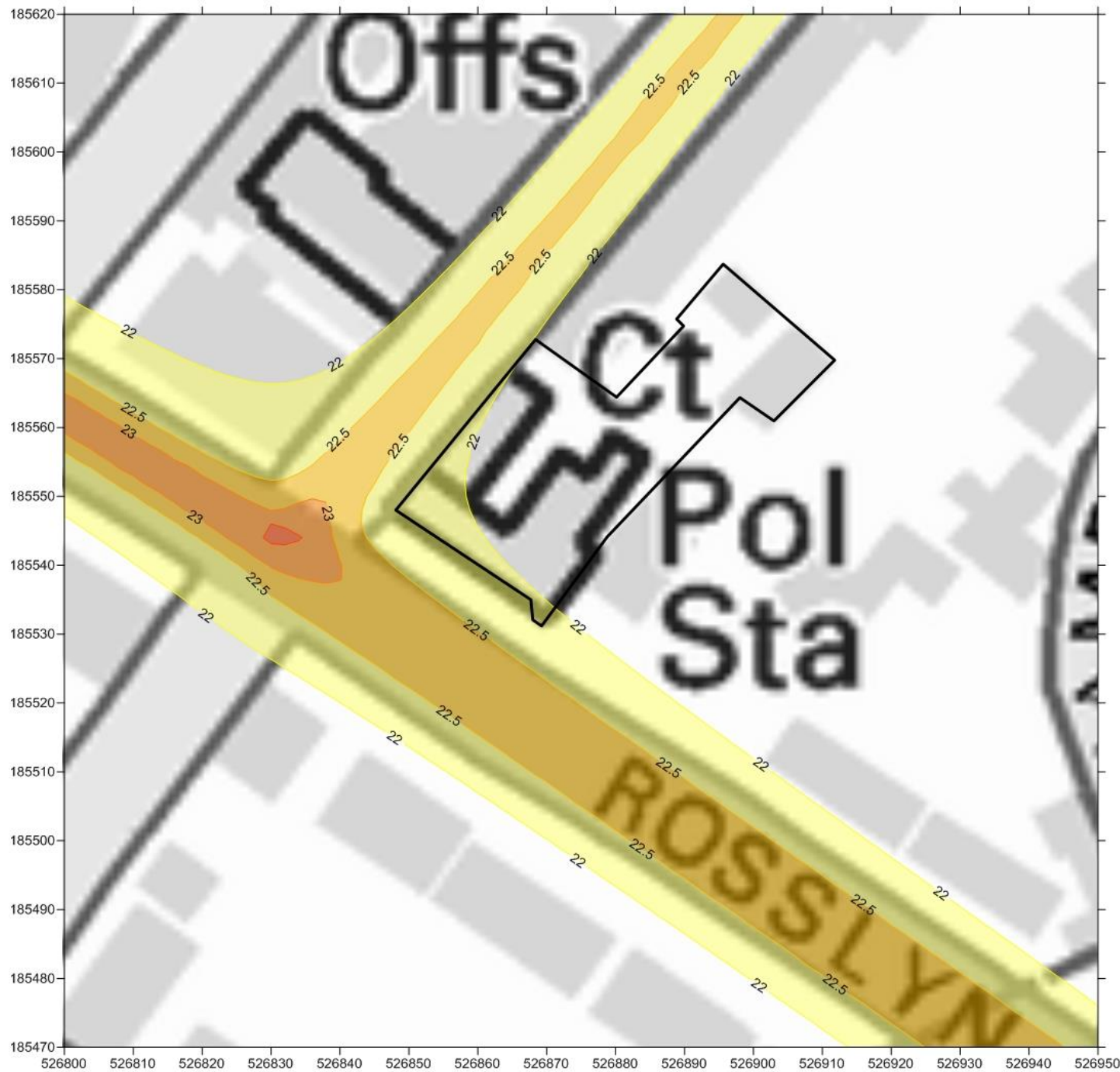
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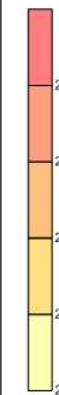
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Legend



Site Boundary



Predicted Annual Mean
PM₁₀ Concentration (µg/m³)

Title

Figure 5
Predicted Annual Mean PM₁₀
Concentrations (µg/m³) 2017
z = 1.5m

Project

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