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PARKHURST ROAD LIMITED

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AIR QUALITY ASSESSMENT

DECEMBER 2013

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1. INTRODUCTION

1.1 Phlorum Limited has been commissioned by Parkhurst Road Limited to produce an air quality assessment for the proposed re-development of a former Territorial Army Centre for residential use.

1.2 The development proposals are to construct 150 dwellings on the site. The residential units will comprise units of one to four bedrooms.

1.3 The Application Site is located in the London Borough of Islington (LBI) on Parkhurst Road (A503). The site is within an established residential area and there is access to a range of shops, restaurants, cinemas and the public transport network. The site area is 0.58ha. There is currently pedestrian access to the site from Parkhurst Road. Adjacent building heights range from 3-storeys to 5-storeys.

1.4 The National Grid Reference for the application site is: 530326, 185906.

1.5 The residential development will be built within an L-shaped plot, where the shortest length of the development will be adjacent to Parkhurst Road. There is currently a building next to Parkhurst Road, within the Application Site boundary.

1.6 In the context of air quality, the main pollution sources in the area are vehicles travelling on the local road network and along Parkhurst Road (A503) in particular. The whole of Islington is designated as an Air Quality Management Area.

1.7 This report has assessed the influence the Proposed Development may have on existing residential receptors in the local area and the impact of current and future air quality on new receptors proposed to be built on the site.

2. BASELINE ASSESSMENT

The UK Air Quality Strategy

2.1 The UKAQS[1] sets a number of "standard" (AQS) concentrations for a number of key pollutants that are to be achieved at sensitive receptor locations across the UK by various "objective" dates. The sensitive locations at which the standards and objectives apply are places where the population is expected to be exposed to the various pollutants over the particular averaging period. Thus for those objectives to which an annual mean standard applies, the most common sensitive receptor locations used to measure concentrations against the set standards are areas of residential housing, since it is reasonable to expect that people living in their homes could be exposed to pollutants over such a period of time. Schools and children's playgrounds are also often used as sensitive locations for comparison with annual mean objectives due to the increased sensitivity of young people to the effects of pollution (regardless of whether or not their exposure to the pollution could be over an annual period). For shorter averaging periods of between 15 minutes, 1 hour or 1 day, the sensitive receptor location can be anywhere where the public could be exposed to the pollutant over these shorter periods of time.

2.2 The objectives adopted in the UK are based on the Air Quality (England) Regulations 2000[2], as amended, for the purpose of Local Air Quality Management. These Air Quality regulations have been adopted into UK law from the limit values required by European Union Daughter Directives on air quality.

2.3 Obligations under the Environment Act 1995 require local authorities to declare an Air Quality Management Area (AQMA) at sensitive receptor locations where an objective concentration has been predicted to be exceeded. In setting an AQMA, the local authority must then formulate an Air Quality Action Plan (AQAP) to seek to reduce pollution concentrations to values below the objective levels.

2.4 Following the publication of several review and assessment reports under the Local Air Quality Management (LAQM) regime, informed by the requirements of the Environment Act 1995, the LBI declared an AQMA in 2001 because of exceedences of the AQSs for NO_2 and PM_{10}.

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[1] Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) July 2007
[2] The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043

2.5 The LBI is an inner-city borough sharing its borders with City of London, Hackney and Camden. It is one of the most densely populated boroughs in England and Wales. The busiest road through the borough is the A1, which is a main source of road emissions. The south-east corner of the borough is part of the London congestion charge zone. In 2003 the local authority declared the whole borough an AQMA due to exceedences of the NO_2 AQSs.

2.6 The four most recent air quality reports produced by the Local Authority are: Air Quality Action Plan, 2003; Updating and Screening Assessment, 2012; Air Quality Progress Report, 2013; and the Draft Islington Air Quality Strategy 2013 to 2016. The 2012 USA showed a slight increase in NO_2 concentrations across the borough, which was a similar pattern seen across most of London. These documents are available on the Local Authority's website.

2.7 The declaration of the PM_{10} AQMA was due to exceedences of the 24-hour mean PM_{10} AQS at Duncan Terrace monitoring station in 2009. However, results from the Air Quality Progress Report published in 2011 showed deceases of annual mean concentrations between 27µg.m^{-3} and 22µg.m^{-3}.

Background Pollution

2.8 The Department for the Environment, Food and Rural Affairs (DEFRA) provides estimated background concentrations of the UKAQS pollutants on the World Wide Web at the UK Air Information Resource (UK-AIR) website, (www.uk-air.defra.gov.uk). These estimates are produced using detailed modelling tools and are presented as concentrations at central 1km^2 National Grid square locations across the UK.

2.9 Being background concentrations, the UK-AIR data are intended to represent a homogenous mixture of all emission sources in the general area of a particular grid square location, which includes locally important industrial and road traffic emissions. Concentrations of pollutants at various sensitive receptor locations can, therefore, be calculated by modelling the emissions from a nearby pollution source, such as a busy road, and then adding this to the appropriate UK-AIR background datum.

2.10 For the Application Site the predicted background pollution concentrations for NO_2 and PM_{10} for 2010 and 2013 are presented in Table 2.1. These data were taken from the central grid square location closest to the site (i.e. grid reference: 530500, 185500).

Table 2.1: Background concentrations of pollutants at the Application site from the UK-AIR

Pollutant	Predicted background concentration ($\mu g.m^{-3}$)		Averaging period	Air quality standard concentration ($\mu g.m^{-3}$)	Objective: to achieve the standard by
	2010	2013			
NO_2	40.1	36.8	annual mean	40.00	31 December 2005
PM_{10}*	22.5	21.6	(gravimetric) annual mean	40.00	31 December 2004

*Proposed PM_{10} objectives for 2010 were dropped in the 2007 Air Quality Strategy (the objective now is to adopt an exposure reduction approach from 2010-2020 for finer $PM_{2.5}$ particulates)

2.11 Table 2.1 shows that annual mean background concentrations for PM_{10} at the Application Site in 2010 and 2013 from the UK-Air Data are predicted to be below the AQS. The NO_2 background concentration for 2013 is below the respective AQS. However, the annual mean concentration in 2010 is slightly above the AQS.

2.12 Concentrations of both pollutants are predicted to decrease from 2010 to 2013, which is in line with national trends predominantly resulting from the gradual roll out of cleaner vehicles.

Local Sources of Monitoring Data

2.13 LBI has a widespread monitoring network including real time monitors for NO_2 and PM_{10} and numerous NO_2 diffusion tubes.

Automatic Monitoring

2.14 There are two automatic monitoring stations in Islington. The category of the Arsenal site is urban background and is representative of a typical residential location. The Holloway Road site is located at the kerbside and returns the highest concentrations found in the borough.

Table 2.2: Annual mean NO_2 concentrations ($\mu g.m^{-3}$) from two automatic monitoring stations in LBI

Monitoring Station (location)	2008	2009	2010	2011	2012
Arsenal*	38	39	37	37	36
Holloway Road#	**65**	**58**	**59**	**60**	**55**

* Urban Background / # Roadside / **Bold** denotes concentrations above the AQS

2.15 The above annual mean concentrations for both monitoring stations have remained consistent over the period between 2008 and 2012. Higher concentrations are recorded at the kerbside location. The Arsenal monitoring station type is urban background, located some distance from the major roads in the area. The concentrations recorded are typical of a large urban centre in the UK.

2.16 At the Arsenal site the annual mean concentration for 2012 is 10% below the AQS; whereas the annual mean concentration for Holloway Road is 37% above the AQS for the same year. However in 2009 the percentage below the AQS is 3%. These results indicate that pollution concentrations have slightly improved over the last five years, particularly at urban background locations.

Table 2.3: Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Monitoring Station (location)	2008	2009	2010	2011	2012
Arsenal*	0	3	0	0	1
Holloway Road#	**0**	**6**	**8**	**2**	**0**

* Urban Background / # Roadside / In **Bold**, exceedence of the NO_2 hourly mean AQS objective (200 $\mu g.m^{-3}$ – not be exceeded more than 18 times per year).

2.17 The above table shows that the 1-hour mean AQS was not exceeded more than 18 times a year between 2008 and 2012 at the urban background location.

Table 2.4: Annual mean PM_{10} concentrations ($\mu g.m^{-3}$) from two automatic monitoring stations in LBI

Monitoring Station (location)	2008	2009	2010	2011	2012
Arsenal*	21	20	22	22	24
Holloway Road#	30	27	27	25	26

* Urban Background # Roadside

2.18 The results in Table 2.3 show that annual mean concentrations for PM_{10} are below the AQS for the years between 2008 and 2012.

Table 2.5: Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Monitoring Station (location)	2008	2009	2010	2011	2012
Arsenal*	11	3	5	15	18
Holloway Road#	21	7	8	25	14

* Urban Background / # Roadside / PM_{10} daily mean AQS objective (50 $\mu g.m^{-3}$ – not be exceeded more than 35 times per year).

2.19 The above table shows that the 24-hour mean AQS was not exceeded more than 35 times a year between 2008 and 2012 at the urban background location.

Non-Automatic Monitoring

2.20 LBI manage a network of 21 diffusion tubes across the borough. There are 9 roadside locations and 10 background locations. Additional monitoring also takes place at the Metroline bus garage.

2.21 Results from the locations in the vicinity of the Application Site are shown below in Table 2.6.

Table 2.6: NO_2 annual mean concentrations ($\mu g.m^{-3}$) monitored from the LBI diffusion tube network

Location	Type	NO_2 annual mean concentrations ($\mu g.m^{-3}$)				
		2008	**2009**	**2010**	**2011**	**2012**
Arran Walk	Urban background	**46**	30	36	33	32
Sotheby Road	Urban background	35	31	31	30	28
Highbury Fields	Urban background	33	30	33	36	33
Lady Margaret Road	Urban background	39	39	37	35	34
Zoffany Park	Urban background	37	31	31	35	31
Elthorne Park	Urban background	36	32	32	34	30
Turle Road	Urban background	36	30	32	33	32
Pemberton Gardens (Bus 1)	Urban background	n/a	**50**	**47**	**52**	**52**
Pemberton Gardens (Bus 2)	Urban background	n/a	36	38	**41**	40

Values in **bold** have exceeded the AQS. All values have been bias adjusted.

2.22 The above table shows a selection of diffusion tube results from the vicinity of the Application Site. They show that annual mean concentrations have slightly reduced since 2011. The results show that the NO_2 concentrations on average are 23% below the AQS, not including the Pemberton Garden locations. The diffusion tube results from the majority of the urban background locations are more likely to be representative of site conditions at the Application Site. Exceedences have been recorded at the Pemberton Garden location, which is likely due to a higher number of diesel vehicles accessing the bus garage.

2.23 With regard to achievement of the hourly mean NO_2 AQS, research[3] has indicated that it is reasonable to assume that this short term standard is likely to be achieved if annual mean concentrations are below $60\mu g.m^{-3}$. On this basis, for all automatic and non-automatic monitoring data presented above, it is likely that the hourly mean NO_2 standard has been achieved at all monitored locations.

[3] AQC. 2007. Deriving NO_2 from NO_X for Air Quality Assessments of Roads - Updated from 2006. AQC: Bristol.

3. ASSESSMENT METHODOLOGY

Guidance and Policies

3.1 Local air quality management technical guidance[4] was followed in carrying out the assessment. Guidance published by the Institute of Air Quality Management (IAQM) in 2011[5] on the *'Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance'* was used when assessing the construction phase of the Proposed Development. The London Councils and Greater London Authority[6] document is a best practice guide for the control of dust from construction. It provides a number of mitigation measures that should be adopted to minimise impacts of dusts and fine particles. The guidance was specifically complied for sites in London.

3.2 The Environmental Protection UK (EPUK) guidance published in 2010[7] on '*Development Control: Planning for Air Quality'* has been used to determine the impact the operation of the Proposed Development is likely to have on local air quality.

Local Plan

3.3 The Core Strategy[8] is a document within the Local Development Framework. It will influence planning decisions throughout the borough until 2025. The Core Strategy was adopted on 17 February 2011.

3.4 Section 3 of the Core Strategy addresses sustainability and contains strategic policies to protect the environment and tackle climate change. Chapter 3.2.15 promotes sustainable transport choices. It promotes walking, cycling and the use of public transport, all of which have been considered as part of the Parkhurst Road scheme. The Application Site will include two car club parking spaces.

3.5 Objective 12 from the proposed Sustainability Framework seeks to:

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[4] DEFRA. 2009. Part IV of the Environment Act 1995, Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management, Technical Guidance LAQM. TG(09). London: DEFRA.
[5] IAQM, 2011, Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance, December 2011.
[6] Greater London Authority and London Councils (2006) The control of dust and emissions from construction.
[7] EPUK, 2010, Development Control: Planning For Air Quality, EPUK.
[8] London Borough of Islington. 2011. The Core Strategy, London Borough of Islington, February, 2011.

"Reduce air, water, noise and soil pollution and their negative impacts on human health" by;

- *"Improving air quality and reduce negative effects on human health"*

3.6 Development Management Policies (DPD) will be used by the local authority to make decisions on planning applications over the next 15 years. With regard to air quality, Policy DM6.1 sates the following:

"E. Developments in locations of poor air quality should be designed to mitigate the impact of poor air quality to within acceptable limits. Where adequate mitigation is not provided and/or is not practical planning permission may be refused.

F. Developments should not cause significant harm to air quality, cumulatively or individually. Where modelling indicates significant harm would be caused this shall be fully addressed through appropriate mitigation."

Mayor's Air Quality Strategy 2013 - 2016

3.7 The Mayor's Strategy[9] outlines measures to improve air quality across London, such as by reducing emissions from the corporate fleet, from buildings, and also through construction of new developments.

3.8 The key aims of the Air Quality Strategy are:

- reduce the impact of poor air quality on the health of residents, workers and visitors, particularly those who are vulnerable;
- fulfil statutory obligations for local air quality management and assist the UK Government and the Mayor of London in meeting air quality limit values;
- encourage and implement cost-effective measures to reduce emissions and exposure to poor air quality;
- raise public awareness and increase understanding of air quality issues; and

[9] Greater London Authority, 2010. Clearing the Air; The Mayor's Air Quality Strategy. Greater London Authority, December 2010.

- encourage good practice by businesses and residents.

The London Plan

Policy 7.14 Improving Air Quality

3.9 This policy within the London Plan[10] recognises the importance of tackling and improving air quality throughout London. The Mayor of London will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimise public exposure to pollution.

Sustainable Design and Construction: Draft Supplementary Planning Guidance (SPG)

3.10 The above document provides guidance on how boroughs can take forward new approaches set out in the London Plan. The SPG[11] provides guidance on the following key areas:

- assessment requirements;
- design and occupation;
- construction and demolition;
- air quality neutral policy for buildings and transport; and
- emission standards for combustion plant.

[10] Greater London Authority, 2011. The London Plan: Spatial Development Strategy for Greater London. Greater London Authority, July, 2011.

[11] Greater London Authority, 2013. Sustainable Design and Construction: Draft Supplementary Planning Guidance. Greater London Authority, July, 2013.

Construction Phase

3.11 The construction phase of the Proposed Development will involve a number of activities that could produce polluting emissions to air. Predominantly, these will be emissions of dust. However, they could also include releases of odours and/or more harmful gases and particles. The IAQM's guidance to assess the impacts of construction on human and ecological receptors has been followed in carrying out this air quality assessment. The guidance suggests that where a receptor is located within 350m of a site boundary and/or within 100m of a route used by construction vehicles up to 500m from the site entrance, a dust assessment should be undertaken. Figure 1 shows that receptors that could be sensitive to dust are located within 100m of the site boundary.

3.12 The IAQM guidance suggests Demolition, Earthworks, Construction, and Trackout should all be assessed separately to determine the overall significance of the construction phase.

3.13 The earthworks are anticipated to start in October 2014 and are estimated to take 8 weeks.

3.14 Review of DEFRA's Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.defra.gov.uk), which incorporates Natural England's interactive maps, has identified that there are no designated ecological receptors area within 100m of the application site or the potential construction route.

3.15 Other receptors that are likely to be sensitive to dust effects are residential homes that are located around the whole boundary of the Application Site.

3.16 The annual mean concentration of PM_{10} and the number of days exceeding the daily mean PM_{10} AQS at the Application Site are likely to be well below their respective standards. PM_{10} monitoring from the local automatic monitoring stations indicates that concentration levels are well below their respective AQS. UK-AIR data for the Application Site also suggests that this remains the case. It is considered, therefore, that the potential sensitivity to dust soiling effects is Medium, with likelihood of exceedences of PM_{10} AQSs being Low.

Construction Significance

3.17 The Dust Guidance published by the IAQM in 2011[5] provides site risk categories for the potential emission of dust from a construction zone. This is determined from the distance of receptors from a construction zone and the magnitude of dust generating activities on site. The site risk categories can be considered to be: 'Low'; 'Medium'; or 'High'.

3.18 The IAQM Dust Guidance provides two tables to determine the significance of dust impacts on receptors before and after the implementation of appropriate mitigation measures. The significance can be considered as: 'Negligible'; 'Slight Adverse'; 'Moderate Adverse'; or 'Substantially Adverse'. This is determined by the site risk category with the sensitivity of receptors. The sensitivity of human receptors is determined by their distance and number within specific distances from the construction zone in addition to the local PM_{10} concentrations. The sensitivity of ecological receptors are determined by their statutory designation, being either Non-designated, or of Local, National or European importance.

3.19 The overall significance for the construction phase can then be judged from the construction stages assessed.

Operational Phase

Vehicle Emissions

3.20 Vehicle emissions will arise from the combustion of fossil fuels in vehicle engines and their subsequent release to atmosphere via tailpipe exhausts. The most significant pollutants released by HGVs and other vehicles are oxides of nitrogen (NO_2/NO_X) and fine particulate matter (PM_{10} and $PM_{2.5}$). Releases of carbon monoxide (CO) and some volatile hydrocarbons (e.g. benzene and 1,3-butadiene) are of less significance and are not assessed further in this report.

3.21 As it is elevated annual mean concentrations of NO_2 and PM_{10} that have resulted in the declaration of most AQMAs across the UK, these are the pollutants of most concern and they have, therefore, been the focus of this air quality assessment.

ADMS Road Assessment

3.22 In order to determine the effects on local air pollution concentrations from the operation of the Proposed Development, emissions from local traffic have been assessed using a detailed air dispersion model. The model used was ADMS-Roads (version 3.1). The ADMS-Roads model is a comprehensive tool for assessing air pollution concentrations from traffic and industrial emissions.

3.23 ADMS-Roads is produced by CERC and has been validated and approved by DEFRA for use as an assessment tool for calculating the dispersion of pollutants from traffic on UK roads.

3.24 Detailed, hourly sequential meteorological data are used by the model to determine pollutant transportation and levels of dilution by the wind and vertical air movements. Meteorological data used in the model were obtained from London City Airport meteorological station as it was considered to provide the most representative data of similar conditions to the Application Site. The meteorological data used for this assessment were from 2011. The surface roughness applied to the model for the meteorological station Application Site was 1m.

3.25 A receptor grid originating at the grid reference 530142, 185796, made up of 31 × 31 receptor points with additional points aligned to the roads within the model domain, was used to generate contour plots of annual mean NO_2 and PM_{10} concentrations.

3.26 Receptors were modelled at ground level to represent a worst case scenario.

3.27 Traffic data used in the assessment were provided by the traffic consultant for this project. This assumed that the Proposed Development will generate 16 LGV and 4 HGV movements per day in 2016. Current figures from the Department for Transport indicate that traffic in London is decreasing.

3.28 The model scenarios assessed are as follows:

- 2013 baseline year;
- 2016 opening year of the Proposed Development without development flows; and
- 2016 with the operation of the Proposed Development.

3.29 The assessment methodology was discussed with the Air Quality Officer at the LBI.

Operational Significance

3.30 Guidance published by the EPUK in 2010[7] provides definitions of Impact Magnitude for changes in annual mean NO_2 and PM_{10} concentrations and for the number of days exceeding the daily mean PM_{10} standard. The magnitudes of change to air quality can be considered as *"Imperceptible", "Small", "Medium" and "Large"*.

3.31 The EPUK guidance also provides Impact descriptors, which are derived from the Impact Magnitude definitions. The Impact descriptors, which are analogous to the "significance" of impacts caused by the proposed development, are determined by how far above or below the appropriate air quality standards the proposed development causes air pollution concentrations to be. The EPUK provides a table in their guidance[7] to determine this.

3.32 The Impact Descriptors enable significance of change caused by the operation of the Development to be denoted as either *"Negligible", "Slight Adverse/Beneficial", "Moderate Adverse/Beneficial"* or *"Substantial Adverse/Beneficial"*.

4. CONSTRUCTION IMPACTS

4.1 The construction phase of the proposed development will involve a number of activities that could produce polluting emissions to air.

4.2 The earthworks are anticipated to take place from October 2014 for eight weeks. The development is proposed to be completed in 2016. The receptors likely to be most sensitive to dust impacts are the residential properties located to the north, east, west and south of the Application Site. There is a nursery and associated playgrounds adjacent to the site.

4.3 The annual mean concentration of PM_{10} and the number of days exceeding the daily mean PM_{10} AQS are below their respective AQSs. It is considered, therefore, that the potential sensitivity of the Application Site to dust soiling effects is Medium, with the likelihood of exceedences of the PM_{10} AQSs being Low.

4.4 The IAQM guidance suggests Demolition, Earthworks, Construction, and Trackout should all be assessed separately to determine the overall significance of the construction phase.

Demolition

4.5 The existing structures on the Application Site will be demolished. The volume of the buildings to be demolished, using the IAQM guidance could be in the region of 18,000m^3. This should be considered to potentially cause a large impact and the site be considered Medium Risk.

Earthworks

4.6 There are localised patches of contamination consisting of TPH and asbestos.

4.7 Ground clearance works and excavations for services and foundations will be performed during this stage. The area of the Application Site is approximately 0.581 hectares. Less than five vehicles at any one time at the site will be moving earth and it is expected at this stage that there should be no requirement to form bunds at the site. It is anticipated that less than 10,000 tonnes will be moved during the earthworks.

4.8 Using the IAQM guidance[12], the site is considered to cause a potentially Medium impact because it is between 2,500m^2 and 10,000m^2 in area. Consequently there is a High Risk of dust emissions from HDV (heavy duty vehicle) movements. The site can be considered High Risk for dust effects during earthworks.

Construction

4.9 During construction the activities that have the potential to cause emissions of dust are concrete batching, or localised use of cement powder, and general handling of construction materials. Furthermore, wind-blow from stockpiles of friable materials has the potential to cause dust emissions, which usually occur during higher wind speeds.

4.10 The main materials to be used during construction are brick render and RC. It is reasonable to assume that the main frame of the construction will be concrete and steel, with further construction comprising use of tarmac and cladding. The total building volume will be <25,000m^3.

4.11 The construction programme for the Proposed Development has indicated that piling for building foundations may well be employed. From past Phlorum experience on similar projects, it is expected that the construction phase would cause a Medium to High Risk of dust impacts.

4.12 The development will achieve Code for Sustainable Homes Level 4. There are proposals to gain one from three credits from NO_X emissions from space heating. The aim is for 100 mg/kWh. The power plant will include micro-modulating gas fired CHP with gas fired condensing boilers.

4.13 The development will be constructed to the standards of the Considerate Constructors Scheme.

[12] Institute of Air Quality Management, 2012, Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance, January 2012.

Trackout

4.14 Construction traffic, when traveling over soiled road surfaces, has the potential to generate dust emissions and also to soil the local road network. During dry weather, un-surfaced and soiled roads can lead to dust being emitted due to pick-up by vehicle wheels. The potential for roads to be soiled is dependent on the length of the on-site unpaved road. It is estimated that the number of vehicles will be less than 25 per day. It is expected that the trackout phase would cause a Medium Risk of dust impacts.

4.15 Vehicles will access the site via the existing site access point and the existing hardstanding surfaces will be utilised.

4.16 Combustion exhaust gases from diesel-powered plant and construction vehicles accessing the site will also be released. However, the volumes and periods over which these releases will occur will be unlikely to result in any significant peaks in local air pollution concentrations.

Risk Effects and Significance of the Construction

4.17 The Summary risk effects for dust soiling and PM_{10} effects as a result of the activities of Demolition, Earthworks, Construction and Track-out, as discussed above, are listed in Table 4.1.

Table 4.1: Summary risk effects of construction, based on the IAQM's dust guidance

Source	Dust Soiling Effects	PM_{10} Effects	Ecological Effects
Demolition	Medium Risk	Medium Risk	Not applicable
Earthworks	High Risk	High Risk	Not applicable
Construction	High Risk	High Risk	Not applicable
Trackout	Medium Risk	Medium Risk	Not applicable

4.18 Based on the information collected above, summarised in Table 4.1, and by using the IAQM dust guidance, the significance of each phase of the Proposed Development's construction is listed below in Table 4. 2. The overall significance before mitigation is determined to be Moderate Adverse.

Table 4.2: Significance of the construction phase before mitigation

Source	Dust Soiling Effects	PM_{10} Effects	Ecological Effects
Demolition	Moderate Adverse	Moderate Adverse	Not applicable
Earthworks	Moderate Adverse	Moderate Adverse	Not applicable
Construction	Moderate Adverse	Moderate Adverse	Not applicable
Trackout	Moderate Adverse	Moderate Adverse	Not applicable
Overall Significance	**Moderate Adverse**		

Mitigation

4.19 The impacts of dust emissions from the sources discussed above have the potential to cause an annoyance to human receptors living in the local area. With the exponential decline in dust with distance from dust generating activities, it is likely to be receptors within approximately 100m of the dust sources that may experience elevated dust concentrations. Furthermore, these are only likely to be significant in certain weather conditions, e.g. downwind of the source during dry weather. The residential areas that are located within the 100 metre dust zone are illustrated on Figure 1.

4.20 The London Councils and Greater London Authority[6] have produced a best practice guide for the control of dust from construction. The document suggests a number of mitigation measures that should be adopted in order to minimise impacts from dusts and fine particles. Appropriate measures from this guidance that could be included in the construction of the Proposed Development are as follows:

- the use of appropriate sheeting and screening during earthworks;
- the positioning of delivery areas, stockpiles and particularly dusty items of construction plant as far away from neighbouring properties as possible;
- the use of water, administered by boom, hose and/or sprinkler system, on any areas of the construction site where dusty materials are being handled or stored;

- the use of a road sweeper at appropriate times at the site accesses and along Parkhurst Road, if and when it becomes soiled;

- the use of appropriate dust suppression covers on particular items of construction plant; and

- the minimising of drop-heights of all loading and unloading activities that involve the transfer of dusty materials.

4.21 Where dust generation cannot be avoided in areas close to neighbouring properties, additional mitigation measures should be put in place - such as windbreaks, sprinklers, and/or time/weather condition limits on the operation of some items of plant or the carrying out of potentially dust-generating activities.

4.22 After the implementation of the mitigation measures listed above, the significance of each phase of the construction programme will be reduced. Table 4.3 lists the significance of the Demolition, Earthworks, Construction and Trackout phases after mitigation. The overall significance following mitigation is assessed to be Negligible.

Table 4.3: Significance of the Construction Phase after implementing Mitigation Measures with Site Access via Parkhurst Road

Source	Dust Soiling Effects	PM_{10} Effects	Ecological Effects
Demolition	Negligible	Negligible	Negligible
Earthworks	Negligible	Negligible	Negligible
Construction	Negligible	Negligible	Negligible
Trackout	Negligible	Negligible	Negligible
Overall Significance	**Negligible**		

5. OPERATIONAL IMPACTS

Traffic Emissions

5.1 Contour plots of annual mean concentrations of NO_2 and PM_{10} across the Application Site are shown in Figures 2 to 7.

Table 5.1: Summary of Figures 2 to 7

Figure	Description
2	Base 2013 NO_2 Concentrations Contour Map
3	Base 2016 NO_2 Concentrations Contour Map
4	2016 With Development Scenario NO_2 Concentrations Contour Map
5	Base 2013 PM_{10} Concentrations Contour Map
6	Base 2016 PM_{10} Concentrations Contour Map
7	2016 With Development Scenario PM_{10} Concentrations Contour Map

5.2 Figure 2 indicates that the majority of the Application Site is predicted to be currently exposed to NO_2 concentrations below 37µg.m^{-3}; however the frontage of the development, adjacent to Parkhurst Road is predicted to be exposed to concentrations between 40µg.m^{-3} and 45µg.m^{-3}, which is above the AQS for NO_2. Figure 4 shows NO_2 concentrations with development traffic flows for 2016 and the results show that the NO_2 concentrations are predicted to be lower; between 37µg.m^{-3} and 39µg.m^{-3}, along the frontage of the proposed residential building.

5.3 The results also show that by the edge of Parkhurst Road NO_2 concentration for the with development scenario in 2016 are predicted to be above the AQS at 42µg.m^{-3}, which is marked on Figure 4. This is expected, because higher concentrations are usually higher at kerbside locations. Sensitive receptors could be exposed to concentration of up to 41µg.m^{-3}, although concentrations in this range exceed the annual mean AQS, although it is exceeded by just 1%.

5.4 There is a bus lane adjacent to the Application Site; therefore the modelled results represent a worst case scenario, as higher concentrations are likely to occur further towards the centre of Parkhurst Road, where there is a greater flow of traffic.

5.5 The traffic emissions as a result of the proposed development will have a negligible impact on air quality and for the majority of the site the predicted concentrations for NO_2 are below 37µg.m^{-3}.

5.6 Figures 5, 6 and 7 also indicate little effect on PM_{10} concentrations, with the majority of the site in the Figures being within the 23.5µg.m^{-3} contour in 2013 and within the 22.5µg.m^{-3} contour in 2016 for the with development scenario. These values are well below the annual mean AQS of 40µg.m^{-3}.

5.7 All Figures indicate that pollution concentrations decrease across the site with distance from Parkhurst Road, which is clearly the most significant source of pollution affecting the site.

5.8 The short term AQS for hourly NO_2 is difficult to assess accurately using an air quality model that uses Annual Average Daily Total traffic flows and simple pollution monitoring data as inputs. This is because short term fluctuations in traffic movements and industrial emissions are not considered by such data. However, TG09 provides some empirically derived methods to assess short term AQSs. For NO_2 it states that if the annual mean is below 60µg.m^{-3} then it is likely that the hourly AQS will be met.

5.9 Concentrations of NO_2 in Figures 2 to 4 indicate that exceedences of the hourly AQS are unlikely to occur anywhere at the Application Site.

5.10 For PM_{10} the following equation is given to derive the number of days that the daily mean limit of 50µg.m^{-3} is likely to be exceeded:

$$\text{No. 24 hour exceedences} = -18.5 + 0.00145 \times \text{annual mean}^3 + \left(\frac{206}{\text{annual mean}}\right)$$

5.11 The highest annual mean PM_{10} contour at the Application Site has been modelled to be less than 25µg.m^{-3}. Using the above equation, this would result in a likely maximum number of days exceeding the daily PM_{10} AQS of 6 days, which is well below the limit of 35 days.

6. DISCUSSION

6.1 Background data from the UK-AIR in Table 2.1 and roadside monitoring data from the Arsenal automatic station in Table 2.2 indicate that the annual mean NO_2 is just below AQS in the local area.

6.2 The results from this detailed assessment have shown that the effect of local pollution sources on background concentrations, which only just exceed the annual mean NO_2 AQS, at the kerbside are very small. The annual mean predicted concentrations are below the AQS for the majority of the site and the impacts of traffic related emissions are negligible.

6.3 The largest pollution impacts are likely to affect those parts of the Proposed Development that are closest to Parkshurst Road. The proposals for the site have been developed to include provision for drop-off parking only together with a limited number of disabled parking bays. Other green travel plan measures include the provision of cycle parking and the development is located close to a variety of good public transport links. The development will also include the provision of two off-site car club bays, which will be operated by a car cub.

6.4 The impacts arising from traffic emissions are deemed to be negligible, which is considered to be air quality neutral.

6.5 Although the assessment was only carried out for the Proposed Development's opening year of 2016, it is considered reasonable to expect that where AQSs are approached or exceeded, pollutant concentrations will decrease in future years. This follows DEFRA predictions for improved air quality as the UK vehicle fleet is continually renewed and cleaner technologies for power generation come on line.

6.6 The proposed development includes new buildings that will replace the existing TA buildings at the Application Site and they will be constructed to the highest standard using modern materials and technology that will be more thermally efficient than the current use. In addition the proposed development will be much more energy efficient than the current use in terms of: thermal efficiency; use of energy (highly efficient boilers and micro-CHP); incorporation of renewable energy sources (photovoltaics); and utilisation of green roofs.

6.7 The energy efficiency of the proposed development will be an improvement over the current building; therefore it is considered that the new buildings will be air quality neutral in terms of its impact on local air quality.

6.8 The demolition of existing structures on the Application Site and the construction of new buildings could give rise to emissions of dust and PM_{10}, which could cause nuisance effects on local residents. However, these should be effectively controlled with the adoption of appropriate mitigation measures, which can be defined within the detailed construction programme, having regard to the ALG guidance.

7. CONCLUSIONS

7.1 This report has assessed the current air quality at the Application Site and the potential exposure of new sensitive receptors to existing sources of air pollution.

7.2 Detailed dispersion modelling has shown that pollution sources close to the Application Site have a negligible effect on it.

7.3 Although background pollution data suggest that the annual mean NO_2 AQS is currently exceeded at the site, this is by a very small amount and will only affect the frontage of the building and kerbside.

7.4 The most sensitive uses at the site are proposed to be developed as far from the adjacent road as possible. This should help mitigate the exposure of future residents to traffic emissions. Considering the above, the Proposed Development should not significantly affect the aims of Islington's on-going LAQM work to improve air quality across the borough.

7.5 The current buildings will be replaced with modern and energy efficient buildings.

7.6 During construction, and with the adoption of appropriate mitigation measures, dust emissions should not cause any significant off-site effects.

7.7 Considering the above, the Proposed Development has been determined to be acceptable in terms of its impact upon, and sensitivity to, local air quality. It should not, therefore, pose any significant obstacles to the planning process.

Figures

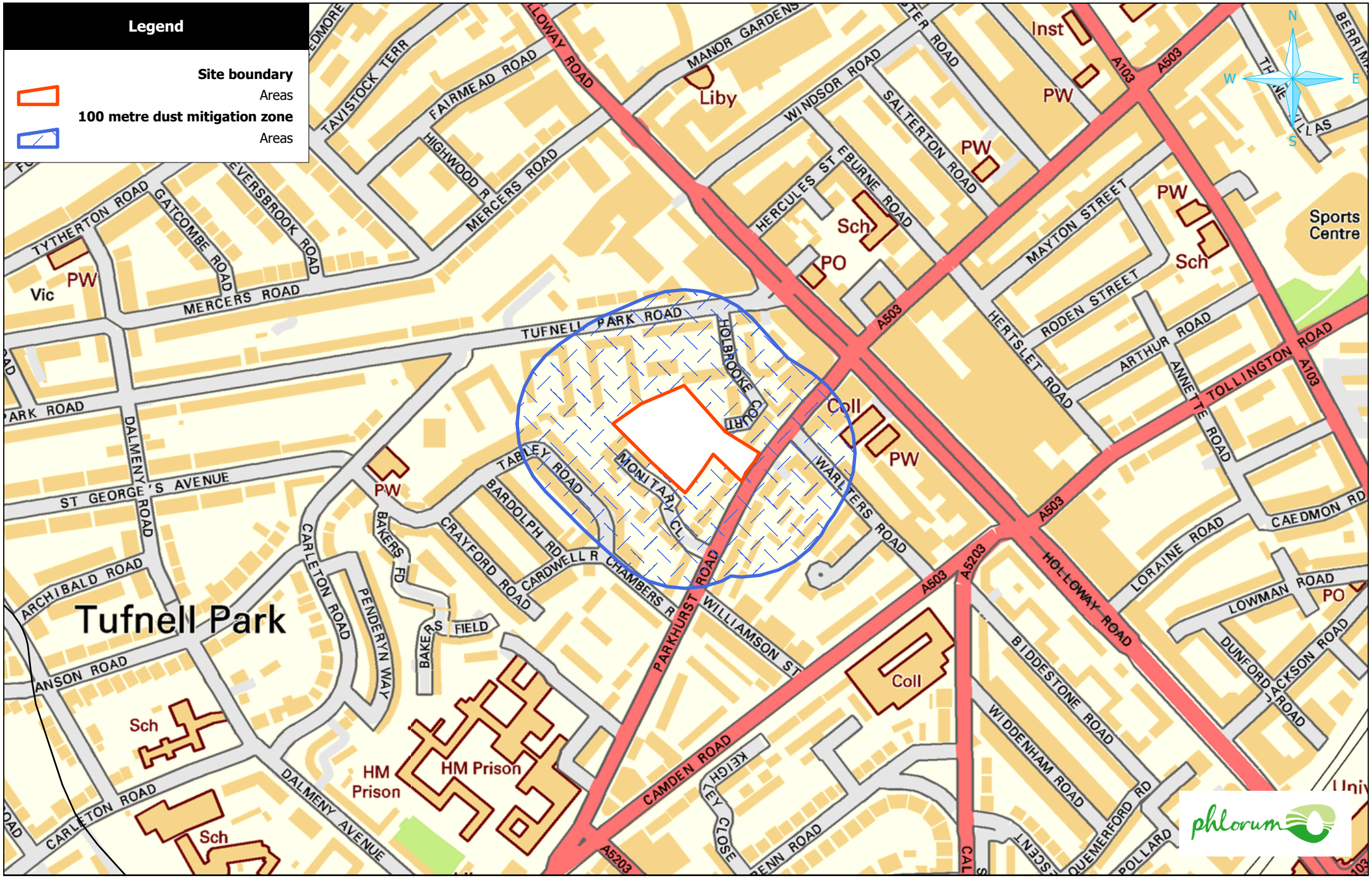

Figure 1: Dust mitigation zone
65 to 69 Parkhurst Road

Phlorum Limited, Unit 12, Hunns Mere Way,
Woodingdean Business Park, Brighton BN2 6AH.
Tel: 01273 307167 Email: info@phlorum.com
Web: www.phlorum.com

Drawn by: GP
Job Number: 5270_S
Scale: 1:5000
Printed at: 11/11/2013

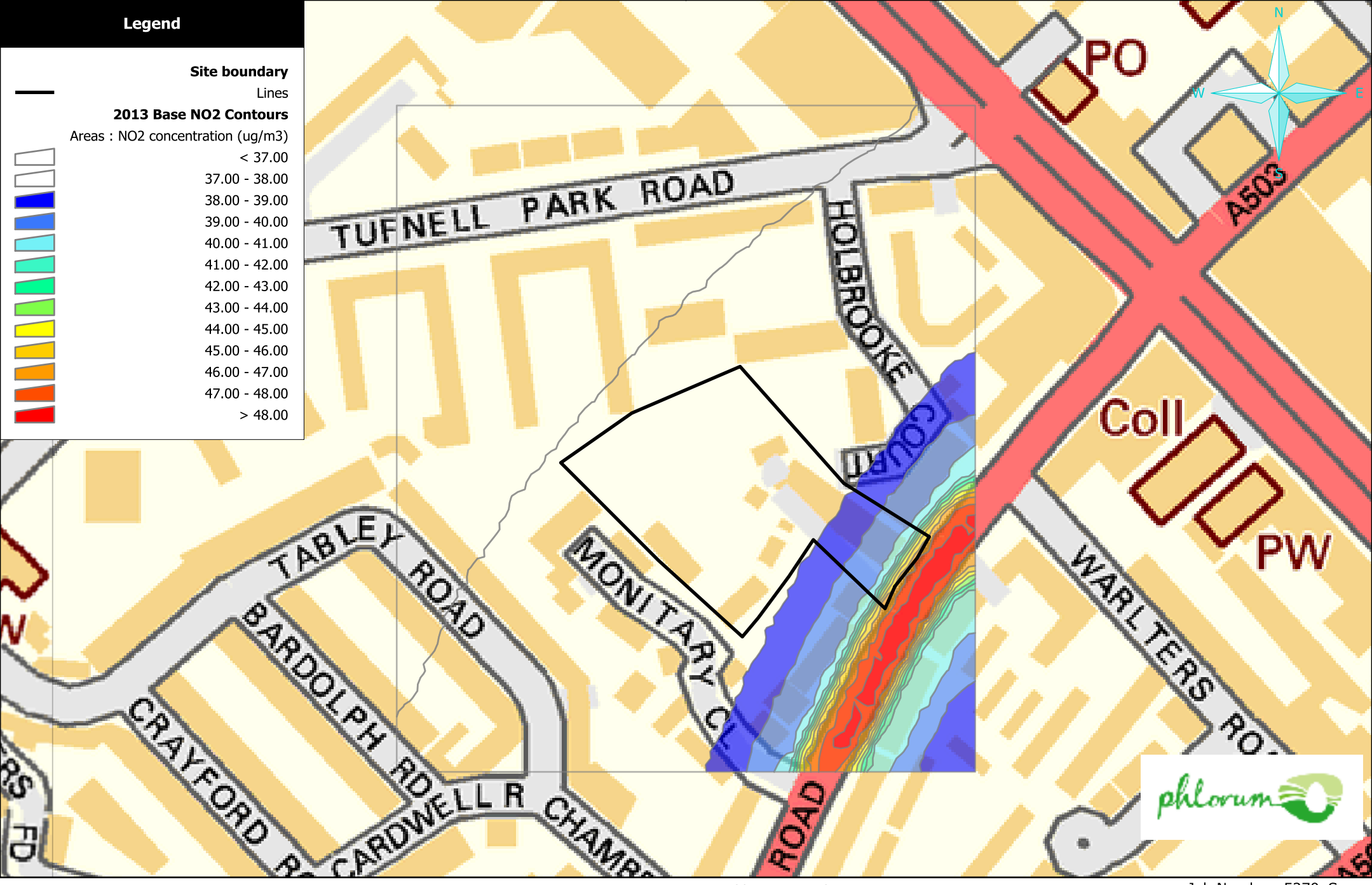

Figure 2 - 2013 Base NO2 Contours Map
Parkhurst Road

Phlorum Limited, Unit 12, Hunns Mere Way,
Woodingdean Business Park, Brighton BN2 6AH.
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Web: www.phlorum.com

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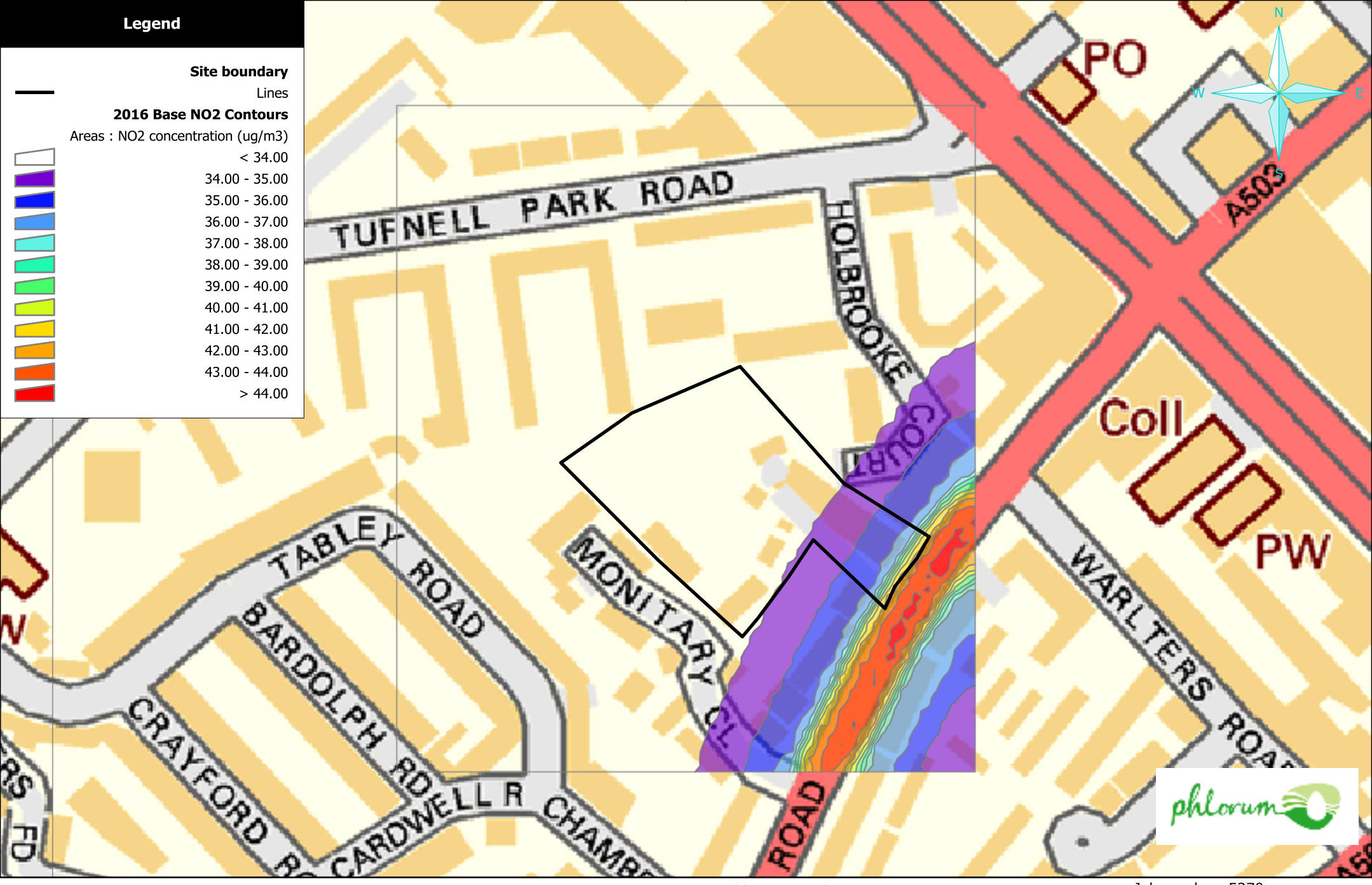

Figure 3 - 2016 Base NO2 Contours Map
Parkhurst Road

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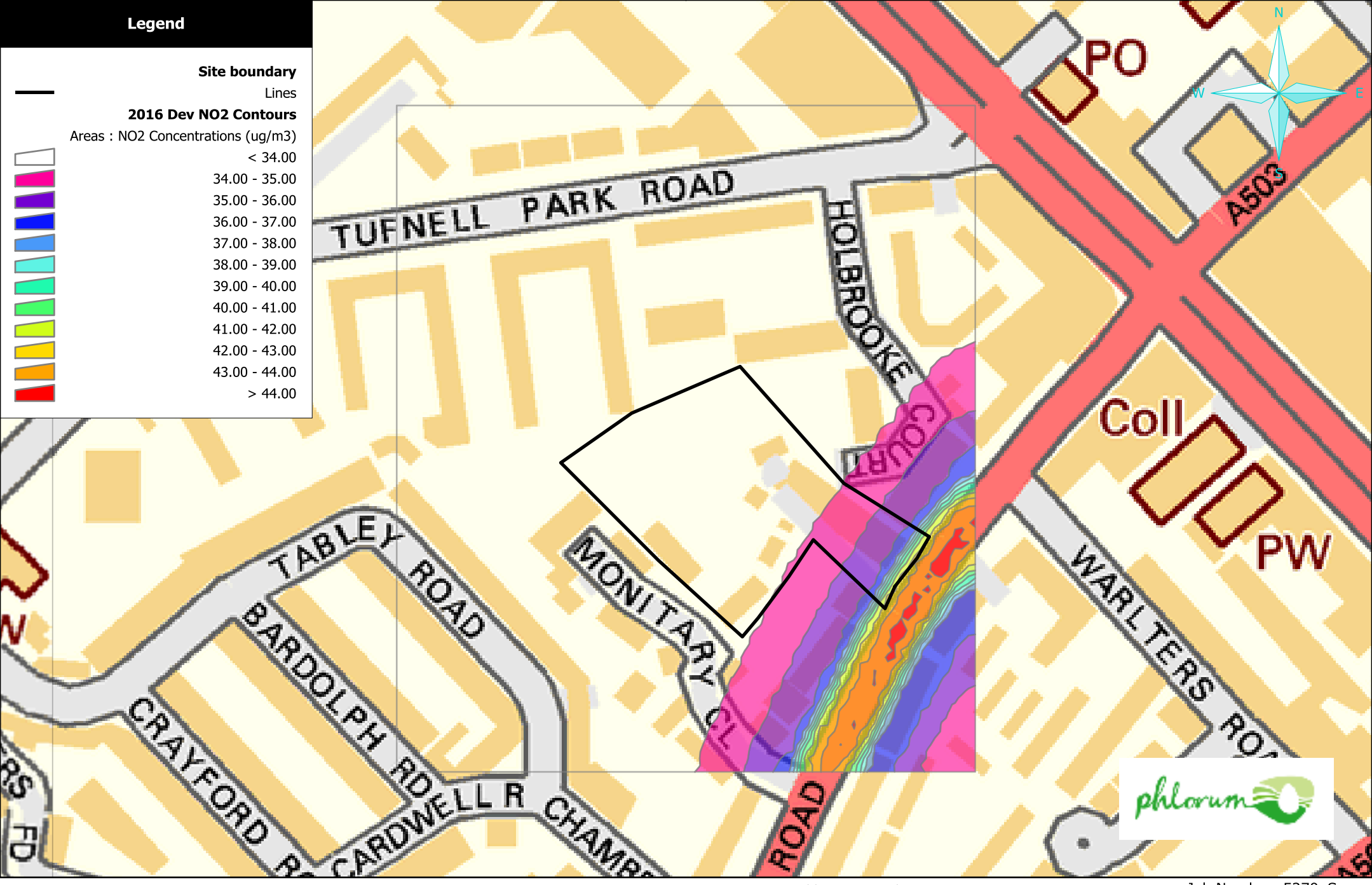

Figure 4 - 2016 Development NO2 Contours Map
Parkhurst Road

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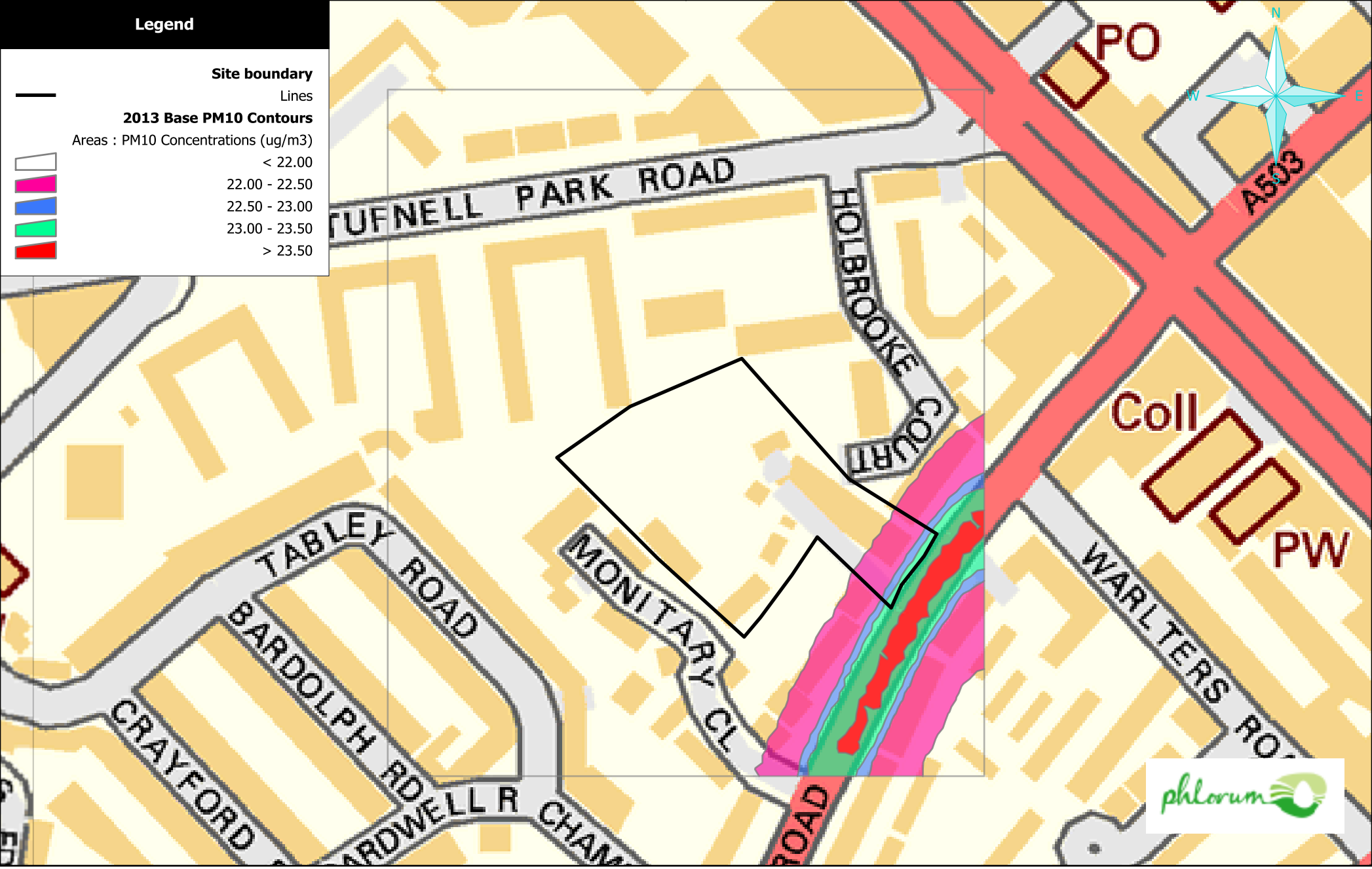

Figure 5 - 2013 Base PM10 Contours Map
Parkhurst Road

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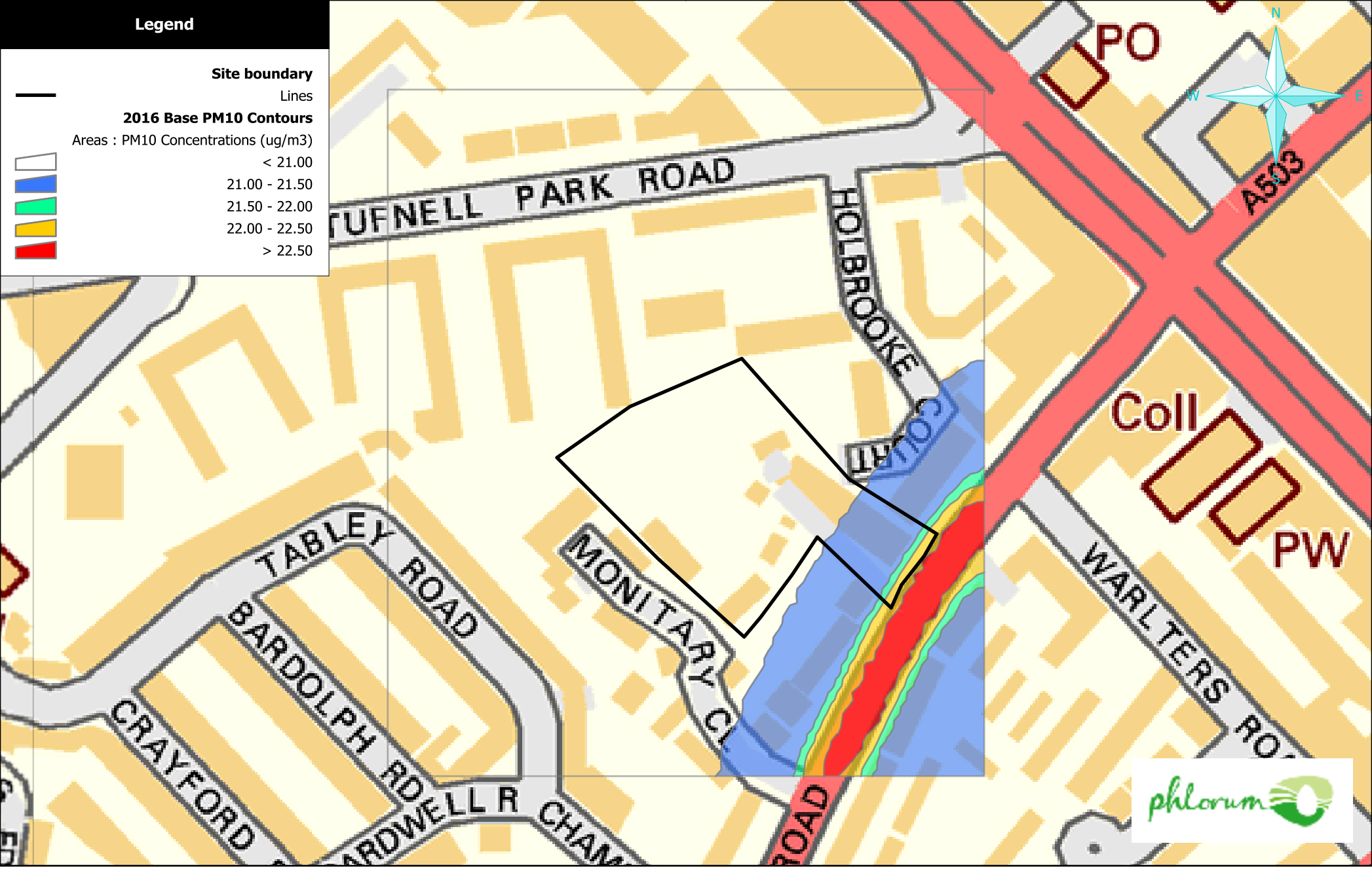

Figure 6 - 2016 Base PM10 Contours
Parkhurst Road

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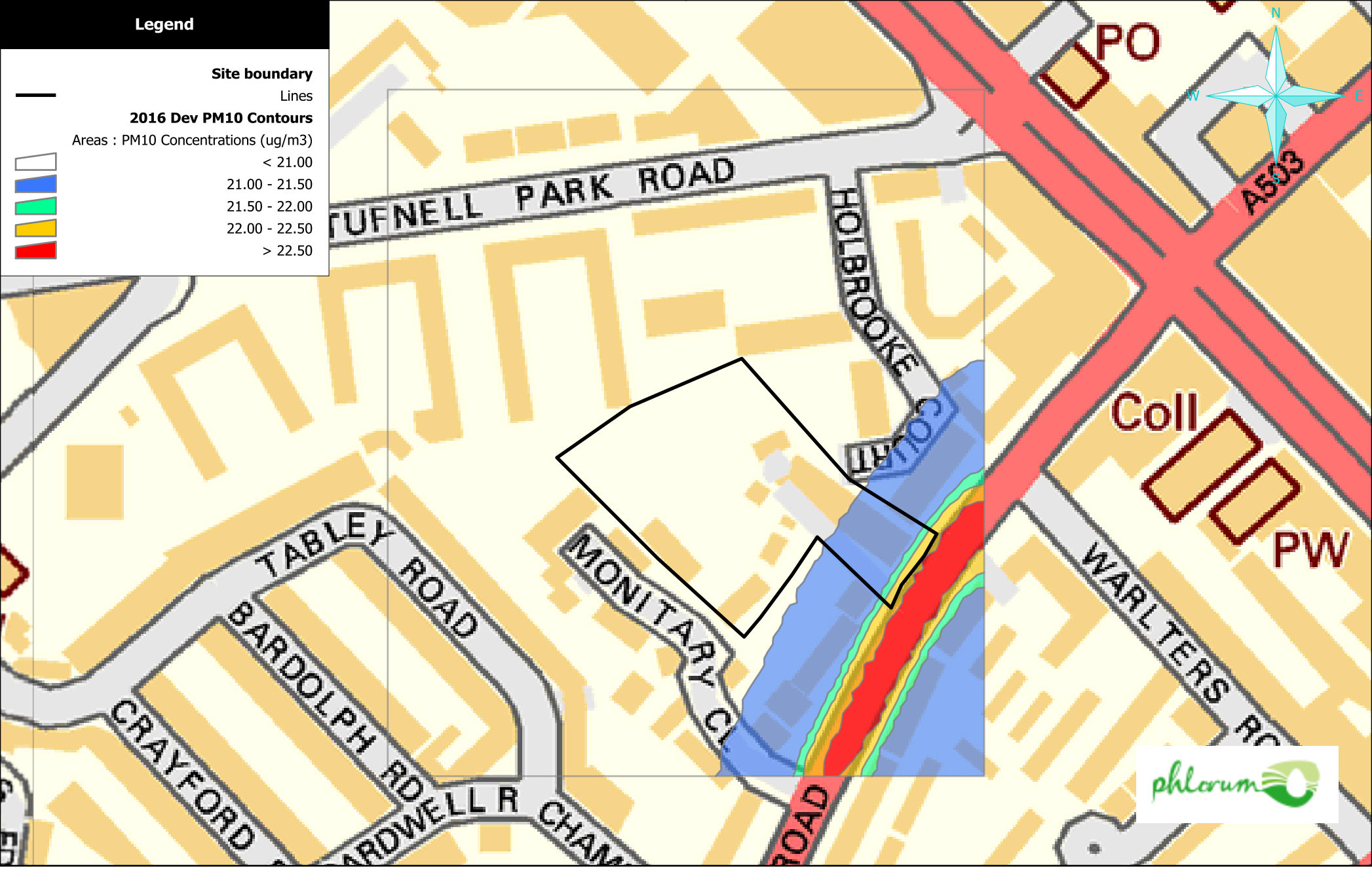

Figure 7 - 2016 Development PM10 Contours Map
Parkhurst Road

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