

AIR QUALITY ASSESSMENT BRYNGELLI INDUSTRIAL ESTATE, HIRWAUN

Prepared for: **Meadow Lane (Hirwaun) Ltd**

By: **S Owen**

Date: **June 2021**



Certificate No. 371682021

DOCUMENT CONTROL SHEET

PROJECT:	Bryngelli Industrial Estate, Hirwaun
TITLE:	Air Quality Assessment

PROJECT REF:	19-01-01-21
REPORT No.:	19-01-01.R1

PREPARED BY:

S Owen:



APPROVED BY:

M Sillick:



Version	Date	Amendments
Original	June 2021	

This report, and information or advice which it contains, is provided by Ofalis solely for internal use and reliance by its Client in performance of Ofalis's duties and liabilities under its contract with the Client. Any advice, opinions, or recommendations within this report should be read and relied upon only in the context of the report as a whole. The advice and opinions in this report are based upon the information made available to Ofalis at the date of this report and on current UK standards, codes, technology and construction practices as at the date of this report. Following final delivery of this report to the Client, Ofalis will have no further obligation or duty to advise the Client on any matters, including development affecting the information or advice provided in this report. This report has been prepared by Ofalis in their professional capacity as Environmental Consultants. The contents of this report do not, in any way, purport to include any manner of legal advice or opinion. This report is prepared in accordance with the terms and conditions of Ofalis's contract with the Client. Regard should be had to those terms and conditions when considering and/or placing any reliance on this report. Should the Client wish to release this report to a Third Party for the party's reliance, Ofalis may, at its discretion, agree to such release provided that:

- (a) Ofalis's written agreement is obtained prior to such release and,
- (b) By release of the report to the Third Party, that Third Party does not acquire any rights, contractual or otherwise, whatsoever against Ofalis and Ofalis, accordingly, assume no duties, liabilities or obligations to that Third Party, and
- (c) Ofalis accepts no responsibility for any loss or damage incurred by the Client or for any conflict of Ofalis's interests arising out of the Clients' release of this report to the Third Party.

BRYNGELLI INDUSTRIAL ESTATE, HIRWAUN

AIR QUALITY ASSESSMENT

Contents	Page
1.0 INTRODUCTION	1
1.1 Site and Context Description	1
1.2 Development Proposal and Potential Impacts	2
2.0 POLICY CONTEXT AND ASSESSMENT CRITERIA	3
2.1 Air Quality Strategy	3
2.2 Clean Air Strategy 2019	3
2.3 Reducing Emissions from Road Transport: Road to Zero Strategy	3
2.4 Planning Policy	3
2.4.1 <i>National Policies</i>	3
2.4.2 <i>Local Transport Plan</i>	4
2.4.3 <i>Local Development Plan</i>	4
2.5 Air Quality Action Plans	5
2.5.1 <i>National Air Quality Plan</i>	5
2.5.2 <i>Clean Air Plan for Wales</i>	5
2.5.3 <i>Local Air Quality Management Areas (AQMAs)</i>	5
2.6 Assessment Criteria	6
2.7 Screening Criteria for Road Traffic	7
2.8 EPUK & IAQM Planning for Air Quality Guidance	7
3.0 ASSESSMENT APPROACH AND BASELINE CONDITIONS	8
3.1 Existing Conditions	8
3.2 Industrial Sources	8
3.3 Local Air Quality Monitoring	8
3.4 Welsh Assembly Government Scheme to Improve A465 Heads of the Valleys Sections 5 and 6: Dowlais Top to Hirwaun	9
3.5 Estimated Background Concentrations	10
4.0 CONCLUSIONS AND RECOMMENDATIONS	11
5.0 REFERENCES	12

1.0 INTRODUCTION

ExCAL Limited was commissioned by Meadow Lane (Hirwaun) Limited to undertake an air quality assessment to support a pre-planning application to construct 35 dwellings at Land adjacent to Bryngelli Industrial Estate, off Meadow Lane, Hirwaun, Aberdare, RCT, CF44 9PS.

The public health department at Rhondda Cynon Taf County Borough Council (hereafter referred to as RCTCBC) provided a consultation response to the outline planning application, with the following specific statement provided with respect to air quality: -

“Air Quality

The development is situated in an area that potentially has poor air quality due to high levels of traffic flow along the A465 as a result future occupiers of the proposed residential units may be affected by the potential poor air quality.

As such it is requested that the applicant either confirms that the residential units will be further than 25 meters from the nearest carriageway edge or submit an air quality assessment in respect of the proposed development prior to determination of this application.

If any mitigation measures are specified they should be carried out and approved prior to beneficial use.”

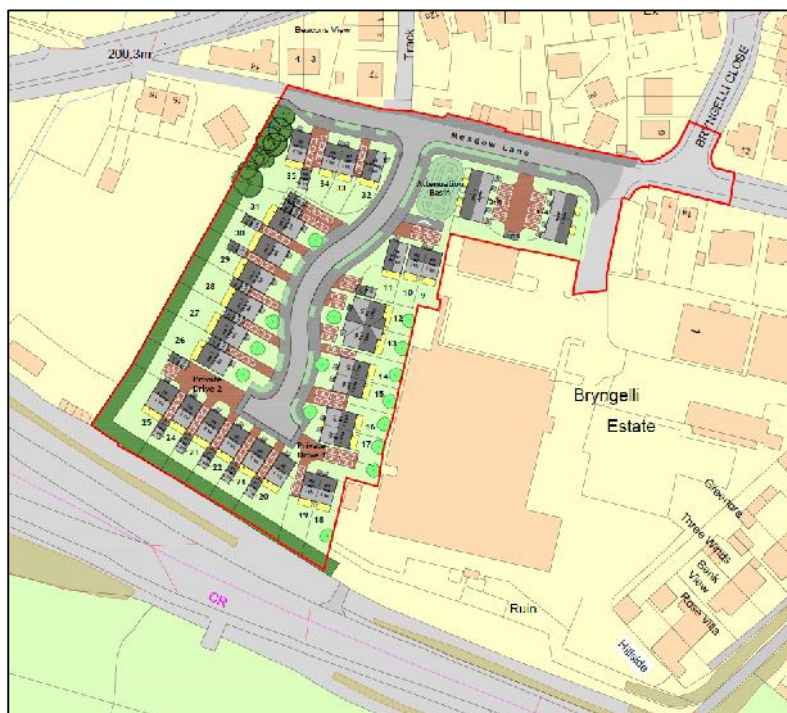
This report provides an assessment of the potential air quality impacts associated with the A465 carriageway on the proposed residential end-use of the development.

1.1 Site and Context Description

The site is located in the village of Hirwaun and is accessed via Meadow Lane. It is currently utilised as a paddock and is approximately 0.3 ha in size.

The proposed development plans are visible in Figure 1 below: -

Figure 1 – Proposed Site Plans



The site is located within the settlement boundary as defined in the Local Development Plan and has been used for agricultural purposes since the mid 1800's with a garage, barn and shed currently existing within the site boundary. The proposal would require the removal of these structures with the construction of 35 dwellings in their place. An Ecology report has been provided which concluded that there will be no adverse ecological impact from the removal of these buildings.

The site is relatively flat with an approximate 3m metre cross-fall from the rear of the site at south west boundary to where the site adjoins Meadow Lane at the Northern boundary. There is no flood risk at the site.

The site is located within the village of Hirwaun in Aberdare. A bus service runs near the site, between the main bus stations of Aberdare and Merthyr Tydfil at 30 minute intervals and the village of Hirwaun has 6 bus stops.

Hirwaun hosts a Primary School, with 3 comprehensive schools situated within a 3 mile radius of the village. Within the village there is a surgery, pharmacy, library, Co-operative food store, football club, rugby club and numerous public houses. Within 3 mile of the site is the Dare Valley Country Park which hosts many activities including horse riding, outdoor pursuits walking and cycling paths.

Hirwaun is positioned within 3 miles of the larger principle town of Aberdare, which has a major commercial centre and a leisure centre. Aberdare has a train service to Cardiff and bus links to both Cardiff and Swansea. Within a 5 mile radius of the site, are major supermarkets of Aldi, Tesco and Asda.

A new hospital has recently been constructed within 8 miles from the site.

1.2 Development Proposal and Potential Impacts

The development will lead to changes in vehicle flows on local roads, which may impact on air quality in the vicinity. The new residential properties will also be subject to the impacts of road traffic emissions from the adjacent road network, particularly the A465 trunk road beyond the southern boundary. The main air pollutants of concern related to road traffic emissions are nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}).

There is also the potential for the construction activities to impact upon the existing area. The main pollutants of concern related to construction activities are dust (PM₁₀).

This report describes existing local air quality conditions (base year 2021), and the predicted air quality in the future assuming that the proposed development does, or does not proceed. The assessment of traffic-related impacts focuses on 2022, which is the anticipated year of development.

This report has been prepared taking into account relevant local and national guidance and regulations.

2.0 POLICY CONTEXT AND ASSESSMENT CRITERIA

2.1 Air Quality Strategy

The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment and also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to undertake regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

2.2 Clean Air Strategy 2019

Defra launched the Clean Air Strategy (Defra, 2019) in 2019. The strategy sets out a wide range of actions by which the UK Government, in partnership with the Governments of Scotland, Wales and Northern Ireland, will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry.

2.3 Reducing Emissions from Road Transport: Road to Zero Strategy

The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper (DfT, 2018) in 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

The paper sets out a number of measures by which Government will support this transition, but is clear that Government expects this transition to be industry and consumer led. If these ambitions are realised, then road traffic-related NO_x emissions can be expected to reduce significantly over the coming decades, likely beyond the scale of reductions forecast in the tools utilised in carrying out this air quality assessment.

2.4 Planning Policy

2.4.1 National Policies

Land-use planning policy in Wales is established within the policy document Planning Policy Wales (PPW) (Welsh Government, 2021), which provides the strategic policy framework for the effective preparation of local planning authority development plans.

PPW places a general presumption in favour of sustainable development, stressing the importance of local development plans, and states that the planning system should perform an environmental role to minimise pollution. Local development plans should enable consideration of the effects that the proposed development may have on air quality, as well as the effect that air quality may have on the proposed development. To prevent unacceptable risks from air pollution, planning decisions should ensure that new development is appropriate for its location.

PPW also places considerable emphasis on the Well-being of Future Generations Act (Wales) (Welsh Government, 2015) with the intention to improve the social, economic, environmental and cultural well-being of Wales and outlines how this can be achieved through the concept of 'Placemaking'.

PPW is supported by a series of Technical Advice Notes (TANs) and National Assembly for Wales Circulars. Local planning authorities have to take PPW, TANs and Circulars into account when preparing Development Plans.

With respect to planning policy guidance, TAN 18 on transport (Welsh Government, 2007) makes reference to local air quality and the need for Air Quality Action Plans to be prepared for any Air Quality Management Areas declared.

The need for compliance with any statutory air quality limit values and objectives is stressed, and the presence of AQMAs must be accounted for in terms of the cumulative impacts on air quality from individual sites in local areas. New developments in AQMAs should be consistent with local air quality action plans.

2.4.2 Local Transport Plan

The South East Wales Valleys Local Transport Plan (LTP) 2015-2020 (RCTCBC, 2015) was adopted in January 2015 and sets out the Council's transport-related key priorities. Section 1.5 outlines the following with respect to air quality and development: -

“Air Quality Action Plans – The Environment Act 1995 placed a duty on local authorities to review and assess air quality in their areas in respect of seven key air pollutants which are known to be harmful to human health and the environment. This assessment may lead to an Air Quality Management Area (AQMA) being declared. At the current time, 14 AQMAs have been declared across the SE Wales Valleys area. Air Quality Action Plans are prepared by the relevant local authority, setting out the measures to address the particular air quality issues that have been identified in each AQMA. The main source of nitrogen dioxide (NO₂) in the SE Wales Valleys is road traffic and concentration levels are often highest where there is severe traffic congestion, often accentuated by local topography and urban layout. Consequently, the Air Quality Action Plans that have been produced in the SE Wales Valleys are relevant to this LTP as the measures for tackling nitrogen dioxide levels are often transport related.”

From the above it can be discerned that one of the key concerns with respect to air quality in the SE Wales Valleys area is pollution from traffic sources and congestion. The proximity of the proposal to the A465 trunk road is therefore pertinent to determine whether there will be a detrimental effect on end-users of the proposed dwellings.

It should be noted that the development **does not** fall within one of the AQMA areas located within the SE Wales Valleys area as outlined above within the LTP.

2.4.3 Local Development Plan

RCTCBC are in the process of developing a Revised Local Development Plan (LDP) 2020-2030 scheduled for adoption in March 2024. In the meantime, the existing LDP (2006-2021) will continue to be the mechanism for determining planning applications and will remain so until the 31st December 2021

Policy AW 10 – Environmental Protection and Public Health within Chapter 5 – Area Wide Policies in the LDP states the following: -

“Development proposals will not be permitted where they would cause or result in a risk of unacceptable harm to health and / or local amenity because of: -

- | | |
|--|----------------------|
| 1. Air pollution; | 2. Noise pollution; |
| 3. Light pollution; | 4. Contamination; |
| 5. Landfill gas; | 6. Land instability; |
| 7. Water pollution; | 8. Flooding; |
| 9. Or any other identified risk to the environment, local amenity and public health or safety. | |

unless it can be demonstrated that measures can be taken to overcome any significant adverse risk to public health, the environment and / or impact upon local amenity.”

Sections 5.63 and 5.64 within Chapter 5 continue to state the following: -

***“5.63.** Pollution may cause significant damage to human health, quality of life and residential amenity, as well as impact upon both the natural and built environment. This policy will ensure that developments that would result in unacceptably high levels of noise, light, water and / or air pollution are located away from residential areas and other sensitive uses. The policy will also ensure that new development is not located in close proximity to existing sources of pollution. Amenity is defined as the pleasant or satisfactory aspects of a location, or features which contribute to its overall character and the enjoyment of residents or visitors.*

***5.64** In November 2007, the Council declared eight Air Quality Management Areas (AQMA), two in the Northern and six in the Southern Strategy Area. The 8 AQMAs are shown on the constraints map and are subject to regular review. Where the Council considers a development may impact upon an existing AQMA or may exacerbate an existing problem, the submission of an assessment setting out the impacts of the development on air quality and outlining appropriate mitigation measures may be required.”*

The development **does not** fall within one of the AQMA areas located within the SE Wales Valleys area as outlined above within the LDP.

2.5 Air Quality Action Plans

2.5.1 National Air Quality Plan

Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017), which is supported by the Welsh Government's Supplemental Plan (Welsh Government, 2018). There is currently no practical way to take account of the effects of the national Plan in the modelling undertaken for this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the EU limit values that are the focus of the Air Quality Plan.

2.5.2 Clean Air Plan for Wales

The Welsh Government published a Clean Air Plan for Wales (Welsh Government, 2020) in 2020, which supersedes the National Air Quality Plan. This includes a Clean Air Zone Framework to allow Local Authorities to establish Clean Air Zones in high pollution areas, improvements to Local Authority reporting on air quality issues; and the establishment of a National Air Quality Assessment and Monitoring Centre for Wales.

2.5.3 Local Air Quality Management Areas (AQMAs)

AQMAs are declared by the RCTCBC via Order under Section 83(1) of the Environment Act 1995. In response to breaches of the Air Quality Objectives for Nitrogen Dioxide, there are currently sixteen Air Quality Management Areas within Rhondda Cynon Taf. These are listed below and overleaf: -

- Aberdare Town Centre Air Quality Management Area
- Broadway Air Quality Management Area
- Church Village Air Quality Management Area
- Cilfynydd Air Quality Management Area
- Cymmer Air Quality Management Area
- Ferndale Air Quality Management Area
- Llanharan Air Quality Management Area
- Llwynypia Air Quality Management Area
- Mountain Ash Town Centre Air Quality Management Area
- Mwyndy Air Quality Management Area
- Nantgarw Air Quality Management Area
- Nightingales Bush Air Quality Management Area
- Pontypridd Town Centre Air Quality Management Area

- Tonyrefail Air Quality Management Area
- Treforest Air Quality Management Area
- Tylorstown Air Quality Management Area.

The Council has produced individual Air Quality Action Plans, for each Air Quality Management Area, which set out actions which may improve air quality within them and further the Councils goal to achieve compliance with the relevant Air Quality Objective throughout Rhondda Cynon Taf.

The development **does not** fall within one of the AQMA areas located within the SE Wales Valleys area as outlined by RCTCBC.

2.6 Assessment Criteria

The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (Wales) Regulations (2000) and the Air Quality (Amendment) (Wales) Regulations (2002).

The objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The PM_{2.5} was also to be achieved by 2020.

Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is **below 60 µg/m³** (Defra, 2018). Therefore, 1-hour nitrogen dioxide concentrations will only be considered if the annual mean concentration is above this level.

Measurements have also shown that the 24-hour PM₁₀ objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m³ (Defra, 2018). The predicted annual mean PM₁₀ concentrations are thus used as a proxy to determine the likelihood of an exceedance of the 24-hour mean PM₁₀ objective. Where predicted annual mean concentrations are **below 32 µg/m³** it is unlikely that the 24-hour mean objective will be exceeded.

The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2018).

The annual mean objectives for nitrogen dioxide and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels.

The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels.

The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.

The European Union has also set limit values for nitrogen dioxide, PM₁₀ and PM_{2.5} (The European Parliament and the Council of the European Union, 2008). The limit values for nitrogen dioxide are the same numerical concentrations as the UK objectives, but achievement of these values is a national obligation rather than a local one. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded.

The relevant air quality criteria for this assessment are provided in Table 1 overleaf

Table 1: Air Quality Criteria for Nitrogen Dioxide, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
Fine Particles (PM ₁₀)	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³ ^(a)
Fine Particles (PM _{2.5})	Annual Mean	25 µg/m ³

^(a) A proxy value of 32 µg/m³ as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM₁₀ objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM₁₀ objective are possible (Defra, 2018).

2.7 Screening Criteria for Road Traffic

Environmental Protection UK (EPUK) and IAQM recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach first considers the size and parking provision of a development; if the development is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000 m² of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. Where these criteria are exceeded, a detailed assessment is required, although the guidance advises that *“the criteria provided are precautionary and should be treated as indicative”*, and *“it may be appropriate to amend them on the basis of professional judgement”*.

2.8 EPUK & IAQM Planning for Air Quality Guidance

The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. The following is specified with regard to the Impacts of the Local Area on the Development: -

“There may be a requirement to carry out an air quality assessment for the impacts of the local area's emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgment and should take into account: -

- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;*
- the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;*
- the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular nitrogen dioxide), that would cause unacceptably high exposure for users of the new development; and*
- the presence of a source of odour and/or dust that may affect amenity for future occupants of the development”.*

3.0 ASSESSMENT APPROACH AND BASELINE CONDITIONS

3.1 Existing Conditions

Existing sources of emissions within the study area have been defined using a number of approaches. Industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2019). Local sources have also been identified through examination of the Council's Air Quality Review and Assessment reports.

Information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority. This covers both the study area and nearby sites, the latter being used to provide context for the assessment. Background concentrations have been defined using the national pollution maps published by Defra (Defra, 2019). These cover the whole of the UK on a 1x1 km grid.

Furthermore, the Welsh Assembly Government has undertaken NO₂ monitoring adjacent to the A465 trunk road as part of an environmental statement supporting the Scheme to Improve A465 Heads of the Valleys Sections 5 and 6: Dowlais Top to Hirwaun. These results have also been included within the assessment and constitute the closest results available to the proposed development.

3.2 Industrial Sources

A search of the UK Pollutant Release and Transfer Register (Defra, 2019) has not identified any significant industrial or waste management sources that are likely to affect the proposed development in terms of air quality.

3.3 Local Air Quality Monitoring

RCTCBC operates a number of operational and historical automatic monitoring stations within its area; however, none of these are in close proximity to the proposed development site. 5-year results for the years 2016 to 2020 are summarised in Table 2 below: -

Table 2: Summary of Nitrogen Dioxide (NO₂) Monitoring (2016-2020)

Site ID	Location & Distance from Site	2016	2017	2018	2019	2020
Annual Hourly Mean (µg/m³)						
RHD4	Rhondda Cynon Taf Broadway – 20.2km	28	28	25	27	20
RHD6	Rhondda Pontypridd Gelliwastad Road – 19.2km	39	31	32	31	25
RHD8	Rhondda Mountain Ash – 11.3km	53	48	45	46	34
Objective		40^(a)				

^aExceedances of the objectives are shown in bold.

^bData have been taken from airquality.gov.wales as directed via RCTCBC website.

The monitoring results presented in Table 2 highlight a general decrease in recorded nitrogen dioxide concentrations over the past five years, however, this has not been observed on every occasion, with the annual mean NO₂ objective being exceeded at monitoring site RHD8 between 2016 – 2019.

It should be noted that general significant decreases in NO₂ identified in all stations in 2020 is likely as a result of the outbreak of COVID-19 and general reductions in traffic due to lockdown measures.

No monitoring data for PM₁₀ or PM_{2.5} concentrations was available at these locations.

3.4 Welsh Assembly Government Scheme to Improve A465 Heads of the Valleys Sections 5 and 6: Dowlais Top to Hirwaun

An environmental statement was prepared by the Welsh Assembly Government in March 2018 to support the proposed improvement works at Section 5 and 6: Dowlais Top to Hirwaun of the A465 Heads of the Valleys trunk road.

As part of the proposals, ambient monitoring of NO₂ was undertaken by RCTCBC across their administrative areas using automatic monitoring stations and a network of passive diffusion tubes.

A six month project specific NO₂ diffusion tube survey was undertaken on the A465 adjacent to the proposed development in 2014 as part of a Welsh Government scheme to improve Sections 5 and 6 of the A465 Heads of the Valleys road between Dowlais Top and Hirwaun. The purpose of the survey was to inform the baseline study and to support the model verification process.

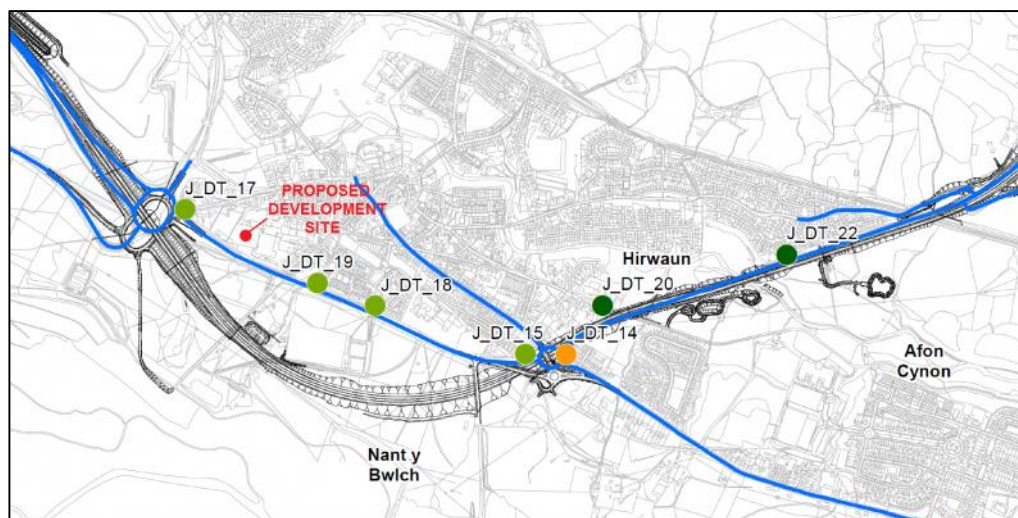
Although undertaken in 2014, the data is still useful and pertinent to the proposed development at this location and consists of the closest recorded real world data available to the proposed development site.

The results of the monitoring, along with the relevant monitoring locations in close proximity to the proposed development site are available for review in Table 3 and Figure 2 below respectively: -

Table 3: Summary of Nitrogen Dioxide (NO₂) Monitoring Undertaken in 2014 as part of Assessment to Support Proposed A465 Development

Site ID	Location	OS Grid Reference		Type	Annual Mean (2014) NO ₂ Concentration (µg/m ³)
		X	Y		
J_DT_14	Hirwaun	296235	205097	Roadside	35.1
J_DT_15	Hirwaun	296113	205098	Roadside	20.6
J_DT_17	Hirwaun	295089	205532	Roadside	23.7
J_DT_18	Hirwaun	295661	205244	Roadside	25.1
J_DT_19	Hirwaun	295487	205311	Roadside	22.1
Objective		40 ^(a)			

Figure 2 – NO₂ Diffusion Tube Locations in Assessment to Support Proposed A465 Development



It can be seen from Table 3 that no exceedances of the NO₂ objective value of 40 µg/m³ occurred during the 2014 assessment.

Furthermore, the location of the monitoring tubes directly adjacent to the A465 carriageway represents a worst case NO₂ concentration. Given that the monitoring tubes are significantly closer to the source of the pollution (road traffic at A465) than any of the development proposals, it is likely that these concentrations would further reduce significantly by dispersal prior to reaching the residential properties, and would as a result not pose any health concerns to end-users of the completed development.

3.5 Estimated Background Concentrations

Estimated background concentrations in the study area have been determined for 2019 using Defra background maps (Defra, 2021) with the nearest 1km x 1km square to the proposed development (X: 295500, Y: 205500) being used.

Furthermore, RCTCBC provide standalone estimation models for future years for a number of pollutants, including NO₂, PM₁₀ and PM_{2.5}.

The 2021 and 2022 models have been utilised for the nearest 1km x 1km square to the proposed development (X: 295500, Y: 205500) for the purpose of this assessment. These background concentrations are outlined in Table 4 below: -

Table 4: Annual Mean Background Pollutant Concentrations in 2019, and 2021/2022 Estimations

Year	NO ₂ (µg/m ³)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
2019 (Defra Pollution Map Mean)	7.16	11.47	7.3
2021 (RCTCBC Prediction)	5.88	11.08	7.1
2022 (RCTCBC Prediction)	5.61	10.96	7
Objectives	40	40	25

As can be seen from Table 4 above, the predicted background concentrations within the vicinity of the development all fall significantly below the objectives.

4.0 CONCLUSIONS AND RECOMMENDATIONS

A number of sources using a combination of actual measurements and modelled estimations have been consulted in order to determine whether the air quality for end-users at the proposed development will be of suitable quality, with a particular focus on NO₂ due to the proximity of the A465 trunk road to the proposed development.

Defra and RCTCBC have developed predicted concentration maps for a number of pollutants in future years. The country is split into 1km x 1km squares, whereby predicted concentrations of NO₂, PM₁₀ and PM_{2.5} have been developed for each of these areas. For the purposes of this assessment, the nearest 1km x 1km area to the proposed development (X: 295500, Y: 205500) has been used. Predicted concentrations of NO₂ in 2021 and 2022 of 5.88 µg/m³ and 5.61 µg/m³ were modelled at this 1km x 1km area respectively – both of which are significantly below the objective value of 40 µg/m³.

Furthermore, this is supported by *in situ* monitoring undertaken in 2014 as part of a Welsh Assembly Government scheme adjacent to the A465, whereby NO₂ concentrations below the objective value of 40 µg/m³ were returned in all samples obtained within close proximity to the proposed development site.

The closest samples to the site, namely samples J_DT_17 (~0.22km NW of site) and J_DT_19 (~0.28km SW of site) returned concentrations of 23.7 µg/m³ and 22.1 µg/m³ respectively.

Given that these samples were obtained directly adjacent to the roadside, these concentrations are likely to further decrease significantly given the proximity of the proposed development site to the sampling stations.

The location of the proposed development is such that there should be little in the way of canalisation of the pollutants from roadside traffic. Furthermore, given the open aired nature of the area, it is expected that the pollutants will dissipate significantly prior to arrival at the proposed development site, a stance which is supported by the Defra Pollution Map Mean data, which returned an NO₂ concentration of 7.16 µg/m³ in 2019 at the nearest 1km x 1km square to the proposed development; significantly lower than the objective value of 40 µg/m³.

In addition to the above, construction to re-route section 5 & 6 of the A465, directing the flow of traffic away from the proposed development begun in early 2021. The reduced traffic flows in close proximity to the site are likely to further significantly increase the quality of air in and around the vicinity, decreasing the detrimental impact on end-users of the proposed development.

It is concluded therefore that by using real world and modelled data, pollutant concentrations at worst-case locations within the proposed development will be below the objective values and as a result, future residents will experience an acceptable air quality.

5.0 REFERENCES

- Neath Port Talbot County Borough Council. (2013). NPTCBC Local Development Plan 2011-2026.
- Neath Port Talbot County Borough Council. (2015). *Local Transport Plan 2015-2020*.
- Neath Port Talbot County Borough Council. (2018a). NPTCBC Air Quality Progress Report.
- Defra. (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Defra.
- Defra. (2017a). *Air quality plan for nitrogen dioxide (NO2) in the UK*.
- Defra. (2017b). *2017 NO2 projections data (2015 reference year)*.
- Defra. (2019). *Clean Air Strategy 2019*.
- Defra. (2018). *UK Pollutant Release and Transfer Register*.
- Defra. (2021). *Local Air Quality Management (LAQM) Support Website*.
- Defra. (2021). *UK Ambient Air Quality Interactive Map*.
- DfT. (2018). The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy.
- Moorcroft and Barrowcliffe et al. (2017, November). *Land-Use Planning & Development Control: Planning For Air Quality v1.2*. IAQM, London.
- The European Parliament and the Council of the European Union. (2008). *Directive 2008/50/EC of the European Parliament and of the Council*.
- Welsh Government. (2007). *Technical Advice Note (TAN) 18: Transport*.
- Welsh Government. (2015). *Well-being of Future Generations (Wales) Act 2015*.
- Welsh Government. (2018). *Planning Policy Wales Edition 10*.
- Welsh Government. (2018). Tackling roadside nitrogen dioxide concentrations in Wales.