

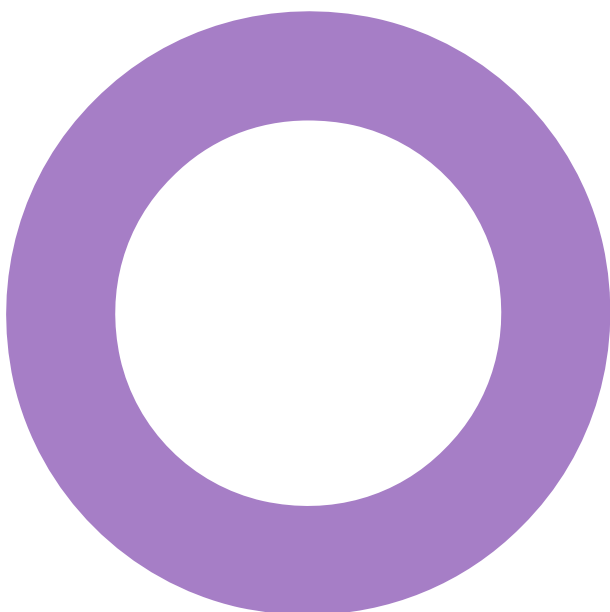
North Denbighshire Community Hospital. Rhyl.

Kier Regional Building - North West.

AIR QUALITY

AIR QUALITY ASSESSMENT

REVISION 01 – 24 APRIL 2020



Audit Sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	21/04/2020	First Draft for Client Comment	ER	KW	CR
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Executive Summary.

Hoare Lea have been commissioned by Kier Regional Building – North West to undertake an Air Quality Assessment to support the planning application for a proposed community hospital in Rhyl, Denbighshire (the 'Application Site').

The proposals comprise the construction of the North Denbighshire Community Hospital, together with the refurbishment of the existing Royal Alexandra Hospital and landscaping works. The Proposed Development will also involve the demolition of the existing Edith Vizard Dental Hospital, Glan Traeth Outpatients, Glan Traeth Ward, Mortuary and Estates buildings.

The baseline assessment shows that the Application Site is not located in an Air Quality Management Area (AQMA), and pollutant concentrations in the vicinity of the Application Site have been in compliance with the relevant air quality objectives over the last five years. Therefore, the Application Site is considered suitable for hospital use without the inclusion of mitigation measures.

The impacts of the construction work on dust and ambient PM₁₀ concentrations have been assessed and the risk of dust causing a loss of local amenity and increased exposure to PM₁₀ concentrations has been used to identify appropriate mitigation measures. Provided these are implemented and included within a dust management plan, for example through a planning condition, the residual impacts are considered to be not significant.

The traffic generated by the Proposed Development as supplied by Curtins Consulting Ltd, is below the criteria set in the Environmental Protection United Kingdom (EPUK) and Institute of Air Quality Management (IAQM) planning guidance and consequently the impact of additional traffic on local air quality is considered insignificant and a detailed assessment is not required.

The energy strategy for the Proposed Development is all electric, with the exception of the domestic hot water supply. Heating will be provided via zero-emission technologies, such as air source heat pumps, wind turbines and photovoltaics. For the hot water supply, two natural gas-fired heaters will be utilised and discharged at roof level. As exact plant specification is not known at the time of writing, an assessment of the impacts of emissions from the combustion plant has not been included in this air quality assessment but, based on the quantum, is considered unlikely to result in significant air quality impacts.

Based on the assessment results, the Application Site is considered suitable for the Proposed Development without the inclusion of mitigation and air quality should not be considered as a constraint to the planning consent.

1. Introduction.

Hoare Lea have been commissioned by Kier Regional Building – North West to undertake an Air Quality Assessment to support the planning application for a proposed community hospital in Rhyl, Denbighshire (the 'Application Site').

1.1 Proposed Development.

The Proposed Development comprises the construction of the North Denbighshire Community Hospital, together with the refurbishment of the existing Royal Alexandra Hospital and landscaping works. The Proposed Development also involves the demolition of the existing Edith Vizard Dental Hospital, Glan Traeth Outpatients, Glan Traeth Ward, Mortuary and Estates buildings. Vehicular access to the Application Site is proposed via Alexandra Road, primarily from the north, with two further access points located along Grosvenor Road for service vehicles.

The energy strategy for the Proposed Development is all electric, with the exception of the domestic hot water supply. Heating will be provided via zero-emission technologies, such as air source heat pumps, wind turbines and photovoltaics. For the hot water supply, two natural gas-fired heaters will be utilised and discharged at roof level. As exact plant specification is not known at the time of writing, an assessment of the impacts of emissions from the combustion plant has not been included in this air quality assessment but, based on the quantum, is considered unlikely to result in significant air quality impacts.

1.2 Application Site Description and Location.

The Application Site is located within Denbighshire County Council's (DCC) administrative area at the approximate National Grid Reference (NGR): X 301490 Y 382070. It is bound by East Parade to the north, Russell Road to the south, Beechwood Road residential dwellings to the west and Grosvenor Road to the east. The Application Site is surrounded predominantly by residential dwellings, with public space and the seafront to the north. The Application Site currently exists as the Royal Alexandra Hospital and its associated buildings.

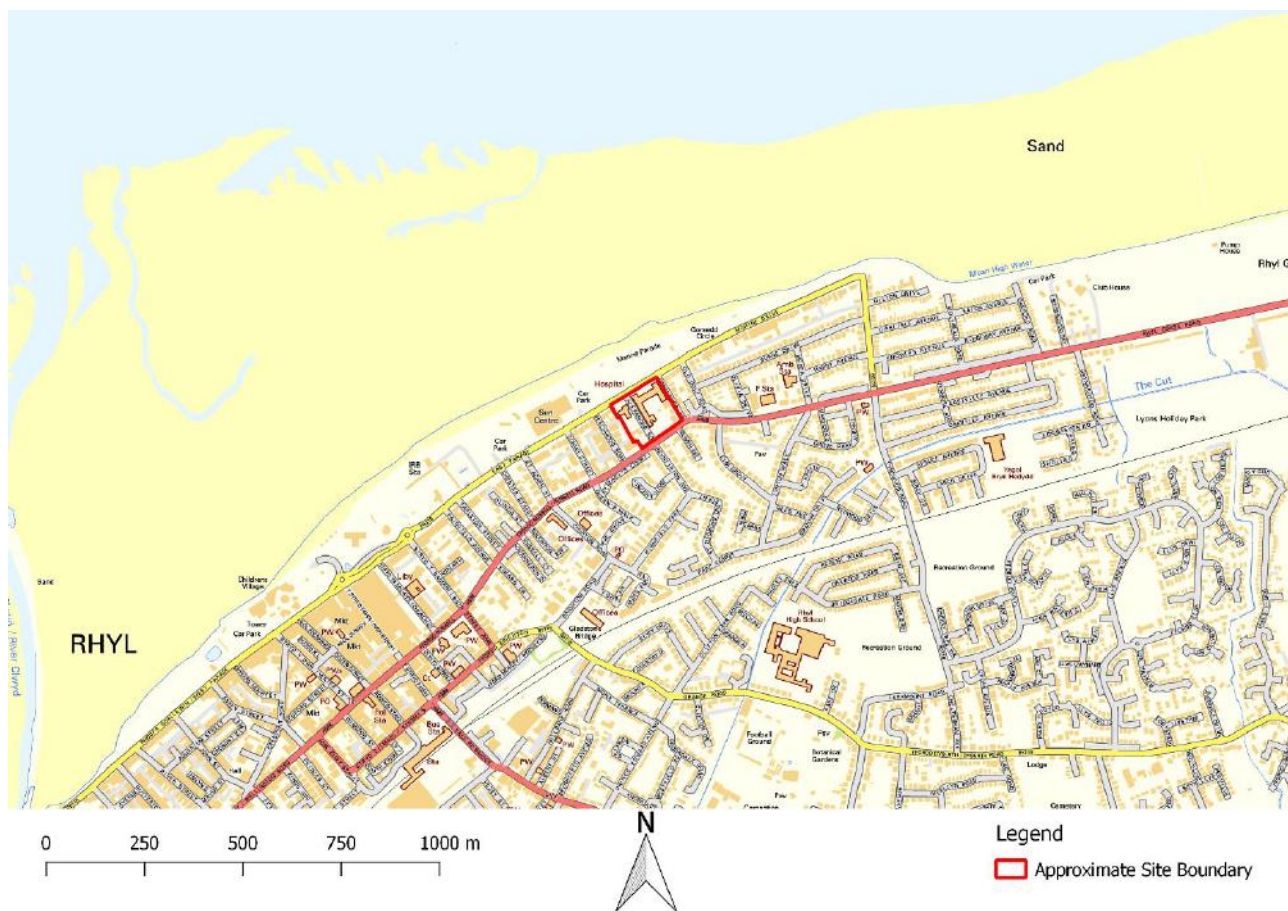


Figure 1: Location of the Proposed Development. Contains OS Data © Crown Copyright and Database rights 2020

A glossary of terms is provided in Section 9.

1.3 Scope of Assessment.

An email detailing the proposed methodology for the Air Quality Assessment was provided to Andrew Lord of the Planning and Public Protection Services department at DCC on the 14 April 2020. At the time of writing, no response has been received. A copy of the correspondence with DCC has been included in Appendix 1.

A summary of the scope of the assessment includes:

- Determination of baseline scenario, using DCC's recent monitoring data;
- Assessment of potential air quality impacts during the construction phase;
- Assessment of potential air quality impacts during the operational phase; and
- Identification of required mitigation measures.

2. Legislation, Policy and Guidance Documents.

2.1 Air Quality Strategy and Local Air Quality Management.

The Environment Act 1995 (Part IV)¹ requires the Secretary of State to publish an air quality strategy and local authorities to review and assess the quality of air within their boundaries. The latter has become known as Local Air Quality Management (LAQM).

The Air Quality Strategy² provides the policy framework for local air quality management and assessment in the UK. It sets out air quality standards and objectives for key air pollutants. These standards and objectives are designed to protect human health and the environment. The Strategy also sets out how the different sectors of industry, transport and local government, can contribute to achieving these air quality objectives (AQOs).

Local authorities are required to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If the objectives are not achieved, the authority must declare an Air Quality Management Area (AQMA) and should prepare an action plan within 12 months. An action plan must identify appropriate measures and policies that can be introduced in order to work towards achieving the objective(s).

The air quality 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 Regulations (Wales) 2000³, and The Air Quality Standards (Wales) Regulations 2010⁴.

The objectives for nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) are set out in Table 1. The objectives for NO₂ 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} objective is to be achieved by 2020. It should be noted that local authorities in England have a flexible role in working towards reducing emissions and concentrations of PM_{2.5}.

Table 1: Air Quality Objectives for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
Nitrogen Dioxide (NO ₂)	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
Fine Particles (PM _{2.5})	Annual Mean	25 µg/m ³

The objectives apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the objective. Examples of where the annual mean objectives should apply are provided in LAQM.TG16⁵, and include: building facades of residential properties, schools, hospitals. The annual mean objectives are not relevant for the building facades of offices or other places of work where members of the public do not have regular access, kerbsides or gardens.

The 24-hour 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 objective for NO₂ also applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets, carparks and bus stations which are not fully enclosed. The 1-hour objective does not apply at kerbside sites where the public do not have regular access.

2.2 EU Limit Values.

The European Union has also set limit values for NO₂, PM₁₀ and PM_{2.5}; these are legally binding and have been implemented into English legislation by The Air Quality Standards Regulations 2010⁶.

The limit values for NO₂, PM₁₀ and PM_{2.5} are the same as the English objectives (Table 1), but applied from 2010 for NO₂, 2005 for PM₁₀ and 2015 for PM_{2.5}. The limit values apply at all locations (apart from where the public does not have access, where health and safety at work provisions apply and on the road carriageway).

2.3 General Nuisance Legislation.

Part III of the Environmental Protection Act (EPA) 1990 (as amended) contains the main legislation on Statutory Nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential Statutory Nuisance.

Fractions of dust greater than 10µm (i.e. greater than PM₁₀) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.4 The Clean Air Plan for Wales.

The Welsh Government is currently in the process of producing The Clean Air Plan for Wales⁷. The plan, which has recently completed a public consultation, aims to improve air quality and reduce the burden of poor air quality on human health, biodiversity and the natural environment. It identifies a series of policies and actions, across various areas, that are required in order to comply with the European and domestic legislative air quality obligations. These actions include:

- Enhancing air quality monitoring and assessment capabilities
- Proposals for a fit for purpose legislative and regulatory air quality management framework for Wales
- Increasing public awareness about air pollution and behavioural change communications to help everyone improve air quality and encourage others to do the same
- Promoting the shift from the private motor vehicle to active travel and public transport

2.5 Planning Policy Wales.

Planning Policy Wales⁸ sets out the land use planning policies of the Welsh Government. It aims to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. It includes advice for considering air quality during the planning process. Relevant sections are set out below:

Paragraph 6.7.2: “National air quality objectives are not ‘safe’ levels of air pollution. Rather they represent a pragmatic threshold above which government considers the health risks associated with air pollution are unacceptable. Air just barely compliant with these objectives is not ‘clean’ and still carries long-term population health risks. Nitrogen dioxide and particulate matter, which are the pollutants of primary national concern from a public health perspective, currently have no safe threshold defined and therefore the lower the concentration of those pollutants the lower the risks of adverse health effects. It is desirable to keep levels of pollution as low as possible.”

Paragraph 6.7.4: “The planning system should maximise its contribution to achieving the well-being goals, and in particular a healthier Wales, by aiming to reduce average population exposure to air and noise pollution alongside action to tackle high pollution hotspots. In doing so, it should consider the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment and identify and pursue any opportunities to reduce, or at least, minimise population exposure to air and noise pollution, and improve soundscapes, where it is practical and feasible to do so.”

Paragraph 6.7.6: “In proposing new development, planning authorities and developers must, therefore:

- address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors;
- not create areas of poor air quality or inappropriate soundscape; and
- seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.”

Paragraph 6.7.7: “To assist decision making it will be important that the most appropriate level of information is provided, and it may be necessary for a technical air quality and noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer.”

Paragraph 6.7.12: “Planning authorities must consider current and future sources of air and noise pollution as part of developing their strategies for locating new development.”

Paragraph 6.7.14: “Proposed development should be designed wherever possible to prevent adverse effects to amenity, health and the environment but as a minimum to limit or constrain any effects that do occur. In circumstances where impacts are unacceptable, for example where adequate mitigation is unlikely to be sufficient to safeguard local amenity in terms of air quality and the acoustic environment it will be appropriate to refuse permission.”

Paragraph 6.7.21: “Regard should be paid to current air quality and noise levels and the quality of the existing soundscape and account taken of any relevant local air quality action plan, noise action plan and/or local or regional air quality strategy as part of development strategies and proposals in development plans and before determining planning applications.”

Paragraph 6.7.26: “Planning authorities must consider the potential for temporary environmental risks, including airborne pollution and surface and subsurface risks, arising during the construction phases of development. Where appropriate planning authorities should require a construction management plan, covering pollution prevention, noisy plant, hours of operation, dust mitigation and details for keeping residents informed about temporary risks.”

2.6 Well-being of Future Generations (Wales) Act 2015.

The Well-being of Future Generations Act⁹ (WFG Act) focuses on providing sustainable development in order to improve economic, social, environmental and cultural well-being in Wales. Regulations made under the WFG Act require public bodies to consider air quality when carrying out statutory assessments of local well-being. Public bodies are required to adopt the following five ways of working to align with the WFG Act sustainable development principle:

- Long-term – the importance of balancing short-term needs with the needs to safeguard the ability to also meet long-term needs
- Integration – considering how the public body’s well-being objectives may impact upon each of the well-being goals, on their objectives, or on the objectives of other public bodies
- Involvement – the importance of involving people with an interest in achieving the well-being goals, and ensuring that those people reflect the diversity of the area which the body serves
- Collaboration – acting in collaboration with any other person (or different parts of the body itself) that could help the body to meet its well-being objectives
- Prevention – how acting to prevent problems occurring or getting worse may help public bodies meet their objectives

2.7 Environment (Wales) Act 2016.

The Environment (Wales) Act 2016¹⁰ sets out the framework for the delivery of sustainable management of natural resources (SMNR). SMNR, which includes air as a natural resource, involves meeting the needs of present generations without compromising the ability of future generations to meet their needs. It sets a legal target of reducing greenhouse gas emissions by a minimum of 80 % by 2050, as well as placing a duty on Welsh Ministers to set interim targets for 2020, 2030 and 2040. The Act contributes towards the achievement of the seven well-being goals set out in the WFG Act.

2.8 Denbighshire County Council Local Development Plan.

The DCC Local Development Plan (LDP)¹¹ was adopted in 2013 and sets out the proposals and policies for future development and land use in Denbighshire until 2021. The following policy in the LDP is relevant to air quality:

"Policy RD1 – Sustainable development and good standard design

Development proposals will be supported within development boundaries provided that all the following criteria are met:

[...]

vi) Does not unacceptably affect the amenity of local residents, other land and property users or characteristics of the locality by virtue of increased activity, disturbance, noise, fumes, litter, drainage, light pollution etc., and provides satisfactory amenity standards itself;

[...]"

DCC is currently in the process of producing a new Local Plan to cover the period 2018-2033. Consultation on the Preferred Strategy¹² has now ended, and the comments received are under review. The final version of the Preferred Strategy is expected to be available for public consultation in Spring 2020.

2.9 Local Air Quality Management in Rhyl.

DCC is part of the North Wales Combined Authority (NWCA), alongside five other local authorities in North Wales. NWCA have not declared any AQMAs in the region and, as such, no Air Quality Action Plans have been published.

2.10 Assessment Guidance.

The primary guidance documents consulted in undertaking this assessment are detailed below.

2.10.1 Defra Local Air Quality Management Technical Guidance

Defra Local Air Quality Management Technical Guidance (LAQM.TG(16))⁵ was published for use by local authorities in their LAQM review and assessment work. The document provides key guidance in aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

2.10.2 Welsh Government Local Air Quality Management in Wales Policy Guidance

The Welsh Government's Local Air Quality Management in Wales Policy Guidance (PG(W)(17))¹³ was published for use by local authorities in Wales. The document provides air quality guidance relating to section 88 of the Environment Act 1995, with a focus on aligning with the principles of the Well-being of Future Generations (Wales) Act 2015.

2.10.3 EPUK-IAQM 'Air Quality Guidance for Planning'

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance¹⁴ to help ensure that air quality is properly accounted for in the development control process. It clarifies when an air quality assessment should be undertaken, what it should contain, and how impacts should be described and assessed including guidelines for assessing the significance of impacts.

2.10.4 IAQM 'Construction and Demolition Dust Guidance'

Guidance on the assessment of dust from demolition and construction has been published by the IAQM¹⁵. The guidance provides a methodology to determine the dust emission magnitude and provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities. This allows for the identification of appropriate mitigation measures that are defined within further IAQM guidance.

3. Methodology of Assessment.

3.1 Consultation.

The approach to the assessment, as described in section 1.3, was provided to DCC for review. A copy of the correspondence with DCC is provided in Appendix 1.

3.2 Existing Air Quality in the Study Area.

A baseline air quality review was undertaken to determine the existing air quality in the vicinity of the Application Site.

This desk-top study was undertaken using the following sources:

- Air quality data for Rhyl, including a review of the DCC's recent air quality reports and local monitoring data;
- The UK Pollutant Release and Transfer Register¹⁶;
- Background pollution maps from Defra's Local Air Quality Management (LAQM) website¹⁷;
- Aerial photography from Google Maps.

3.3 Construction Phase Impacts.

3.3.1 Construction Dust Assessment

The assessment of construction dust impacts has been undertaken in line with the IAQM methodology. Activities on the proposed construction site have been divided into four types to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout

The risk of dust emissions was assessed for each activity with respect to:

- Potential loss of amenity due to dust soiling; and
- The risk of health effects due to a significant increase in exposure to PM₁₀.

The first stage of the assessment involves screening to determine whether there are any sensitive receptors within the threshold distances defined by the IAQM guidance. A detailed assessment of the impact of dust from construction sites will be required where:

- A 'human receptor' is located within 350 m of the boundary of the Site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance;
- An 'ecological receptor' is located within 50 m of the boundary of the Site or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance.

The magnitude of dust emission for each activity is determined on the basis of the guidance, indicative thresholds, information available relating to the project and expert judgement. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the mitigation requirements.

Descriptors for magnitude of impact and impact significance used in this assessment of construction phase dust are reproduced in Appendix 2.

3.3.2 Construction Traffic

3.3.2.1 Construction Traffic Emissions Screening

The screening assessment has been undertaken with reference to the following EPUK and IAQM guidance indicative criteria:

- a change of Light Duty Vehicle (LDV) flows of more than 500 Annual Average Daily Traffic (AADT) (outside an AQMA); and/or
- a change of Heavy Duty Vehicle (HDV) flows of more than 100 AADT (outside an AQMA).

3.3.2.2 NRMM Emissions Screening

Non-Road Mobile Machinery (NRMM) refers to mobile machines, transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads. NRMM emissions have been screened following LAQM.TG(16).

3.4 Operational Phase Impacts.

3.4.1 Road Traffic Impacts

The screening assessment has been undertaken with reference to the following documents:

- Defra's LAQM.TG(16); and
- EPUK and IAQM guidance indicative criteria, i.e.:
 - a change of LDV flows of more than 500 AADT (outside an AQMA); and/or
 - a change of HDV flows of more than 100 AADT (outside an AQMA).

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".

Where impacts can be screened out there is no need to progress to a more detailed assessment.

3.4.2 Site Suitability

A qualitative assessment has been undertaken to consider the site suitability which refers to the exposure of future occupants of the Proposed Development to existing air quality.

The assessment of site suitability will be assessed qualitatively using DCC's recent monitoring data and predicted background concentrations, as modelled by Defra.

3.5 Assessment of Significance.

3.5.1 Construction Dust

The IAQM guidance¹⁵ on the assessment of dust from demolition and construction states that the primary aim of the risk assessment is to identify site specific mitigation that, once implemented, should ensure that there will be no significant effect. Therefore, the assessment has been used to determine an appropriate level of mitigation for the construction phase.

The determination of which mitigation measures are recommended include elements of professional judgement and the professional experience of the consultants preparing this report is set out in Appendix 3.

3.5.2 Operational Impacts

The EPUK and IAQM guidance¹⁴ has been used to assess the potential for significant impacts as a result of vehicle emissions from traffic associated with the Proposed Development. The focus of the guidance is to assess traffic emission impacts and advises on how to describe the air quality impacts and their significance.

3.5.3 Site Suitability

To determine the significance of predicted air quality impacts based upon a site suitability assessment, the EPUK and IAQM guidance states:

"Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means."

4. Baseline Environment.

This section sets out the available information on air quality in the vicinity of the Application Site.

4.1 Site Setting.

The Application Site is located within DCC's area of administration at approximate NGR: X 301490, Y 382070, to the north east of Rhyl's town centre (postcode LL18 3AS). The Application Site currently exists as the Royal Alexandra Hospital and its associated buildings.

4.2 Local Air Quality Management Review and Assessment.

As required by the Environment Act (1995), DCC, as part of the NWCA, has undertaken Review and Assessment of air quality within their area of administrative area. This process has indicated that the annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} are below the air quality objectives in the county. As such, no AQMAs have been declared within DCC's administrative area.

4.3 Local Air Quality Monitoring.

No automatic monitoring stations are currently in operation in Denbighshire, however, DCC utilise passive diffusion tubes to monitor NO₂ concentrations. A review of the most recent monitoring data available indicated that there are four passive diffusion tube monitoring locations within the vicinity of the Application Site, two of which were relocated to other towns in Denbighshire in 2018. Recent monitoring results are shown in Table 2 and the passive diffusion tube locations are illustrated in Figure 2.

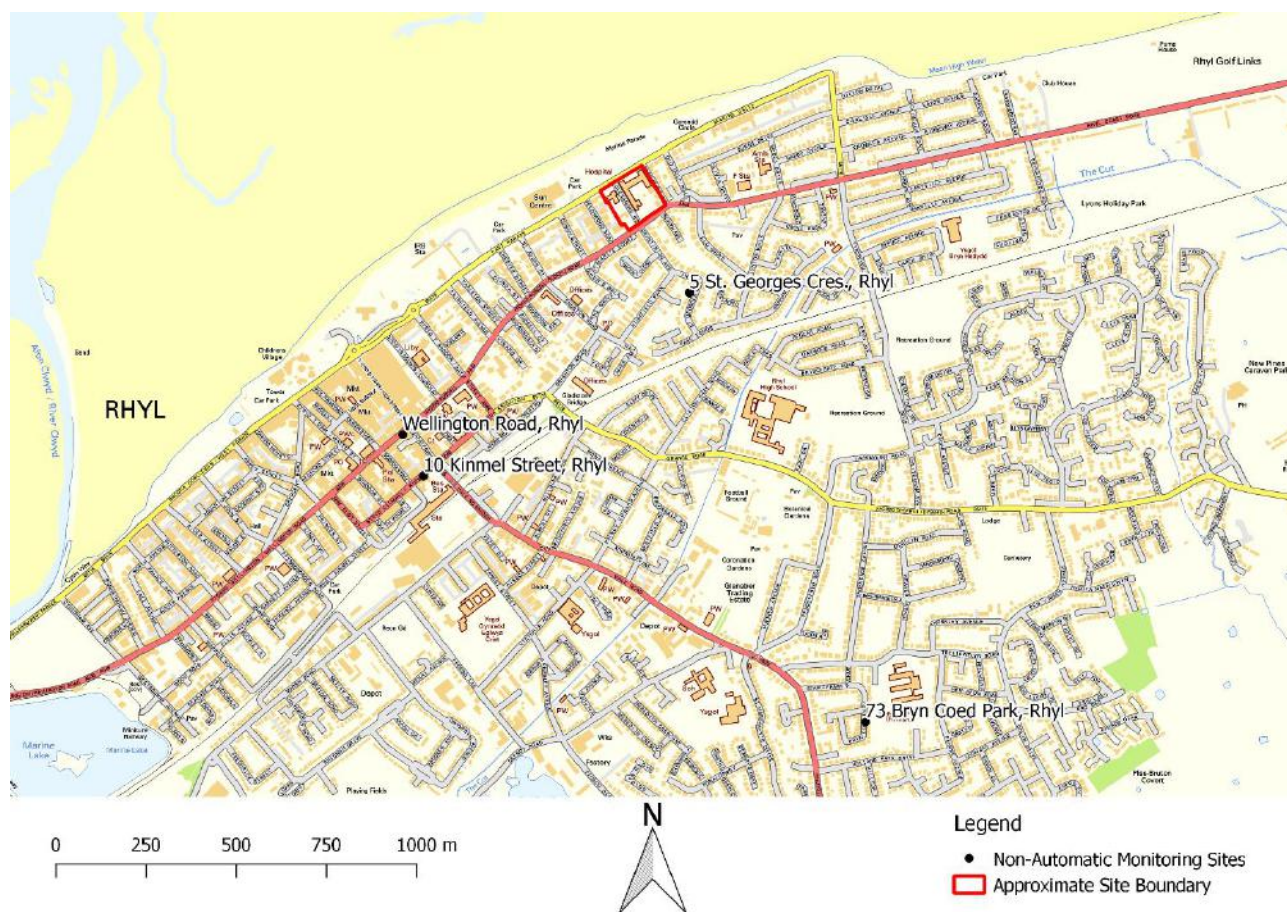


Figure 2: DCC Non-Automatic Monitoring Locations in the Vicinity of the Application Site. Contains OS Data © Crown Copyright and Database rights 2020

Table 2: Passive Diffusion Tube Monitoring Results in the Vicinity of the Application Site.

Site ID	Site Type	Site Name	Distance (m) from site (approx.)	Annual Mean NO ₂ Concentration (µg/m ³)				
				2014	2015	2016	2017	2018
DBB3	Suburban	5 St. Georges Cres., Rhyl	240	9.8	9.3	9.8	8.7	-
DBK1	Roadside	Wellington Road, Rhyl	840	25.8	23.1	23.5	24.9	25.3
DBR2	Roadside	10 Kinmel Street, Rhyl	880	29.1	26.7	26.4	25.7	25.1
DBB4	Suburban	73 Bryn Coed Park, Rhyl	1,510	10.5	9.9	10.3	9.5	-

As shown in Table 2 above, there have been no exceedances of the annual mean NO₂ objective in Rhyl in the last five years.

An annual mean NO₂ concentration of 60 µg/m³ or above is often used to indicate a possible exceedance of the 1-hour mean NO₂ objective. No monitoring locations in the vicinity of the Application Site have exceeded 60 µg/m³ in the last five years.

4.4 Industrial Pollution.

A desk-based review of potential industrial sources using the UK Pollutant Release and Transfer Register¹⁶ did not identify any significant industrial or waste management sources of air pollution that are likely to affect the Application Site with regard to air quality.

4.5 Defra Predicted Concentrations.

The background concentrations have been obtained from the national maps published by Defra¹⁷. These estimated concentrations are produced on a 1 km by 1 km grid basis for the whole of the UK. The Application Site falls into two separate grid squares: X 301500 Y 381500 and X 301500 Y 382500. The predicted concentrations for these grid squares for NO₂, PM₁₀ and PM_{2.5} are provided in Table 3 for 2018, the most recent year with available monitoring data, 2021, the year construction is due to commence, 2022, the anticipated opening year for the North Denbighshire Community Hospital, and for 2023, the anticipated opening year of the refurbished Royal Alexandra Hospital.

Table 3: Predicted Background Concentrations for Grid Square X 301500 Y 381500 for 2018, 2021, 2022 and 2023

Year	Predicted Background Concentration (µg/m ³)			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}
2018	10.8	8.2	9.2	6.3
2021	9.5	7.3	8.9	6.1
2022	9.1	7.0	8.9	6.0
2023	8.7	6.7	8.8	6.0

Table 4: Predicted Background Concentrations for Grid Square X 301500 Y 382500 for 2018, 2021, 2022 and 2023

Year	Predicted Background Concentration (µg/m ³)			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}
2018	7.9	6.1	8.0	5.5

Year	Predicted Background Concentration (µg/m³)			
	NO _x	NO ₂	PM ₁₀	PM _{2.5}
2021	6.9	5.4	7.8	5.2
2022	6.7	5.2	7.7	5.2
2023	6.4	5.0	7.6	5.1

As shown in Table 3 and Table 4, background concentrations are below the relevant air quality objectives for all pollutants in the anticipated final opening year of the Proposed Development, 2023.

4.6 Summary of Background Data.

The baseline assessment has shown no exceedances of the annual mean NO₂ objective in Rhyl over the last five years. Furthermore, Defra predicted background concentrations of NO₂, PM₁₀ and PM_{2.5} are below the relevant air quality objectives in the anticipated final opening year of the Proposed Development, 2023.

5. Construction Phase Assessment.

The potential for air quality impacts during the construction of the Proposed Development are assessed in this section.

5.1 Construction Phase Dust Assessment.

The risk of dust impacts is based on the potential dust emissions magnitude and the sensitivity of the area. These two factors are then combined to determine the risk of dust impacts with no mitigation applied. In the absence of any site-specific information, a higher risk category has been applied to represent a worst-case scenario.

5.1.1 Assessment Screening

There are 'human receptors' within 350 m of the Application Site but no designated habitat sites within 50 m of the Application Site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance. The closest ecological receptor to the Application Site is Graig Fawr, a Site of Special Scientific Interest, located approximately 4.6 km to the south east.

Therefore, an assessment of construction dust on ecological receptors can be screened out from this assessment but an assessment of construction dust at human receptors is required.

5.1.2 Potential Dust Emission Magnitude

The potential magnitude of dust emissions from demolition, earthworks, construction and trackout have been assessed, as identified in Table 5.

Table 5: Predicted Magnitude of Dust Emissions

Activity	Magnitude	Justification
Demolition	Small	The Proposed Development involves the demolition of the existing Edith Vizard Dental Hospital, Glan Traeth Outpatients, Glan Traeth Ward, Mortuary and Estates buildings. The total demolition volume is approximately 8,000 m ³ , with demolition activities less than 10 m above ground level. The potential dust emission magnitude is considered to be small.
Earthworks	Large	The Application Site is predominantly sandstone soils with superficial sandstone deposits ¹⁸ . The total area of the Application Site is approximately 17,000 m ² . As the Royal Alexandra Hospital is being retained and refurbished, the total area subject to earthworks is estimated to be approximately 14,000 m ² . The potential dust emission magnitude is therefore considered to be large.
Construction	Small	The total building volume for the Proposed Development is approximately 17,000 m ³ . Building material will be a mix of masonry material such as concrete which has the potential to generate dust as well as material with a lower dust potential including metals and timber. The potential dust emission magnitude is considered to be small.
Trackout	Large	The Application Site is expected to require between 10 and 50 outward HDV movements in any one day. Due to the size and nature of the Application Site, there is likely to be more than 100 m of unpaved road. The potential dust emission magnitude is considered to be large as a precautionary measure.

5.1.3 Sensitivity of the Study Area

The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM₁₀, the local background concentration; and

- Site-specific factors, such as whether there are natural shelters, such as trees or other vegetation, to reduce the risk of wind-blown dust.

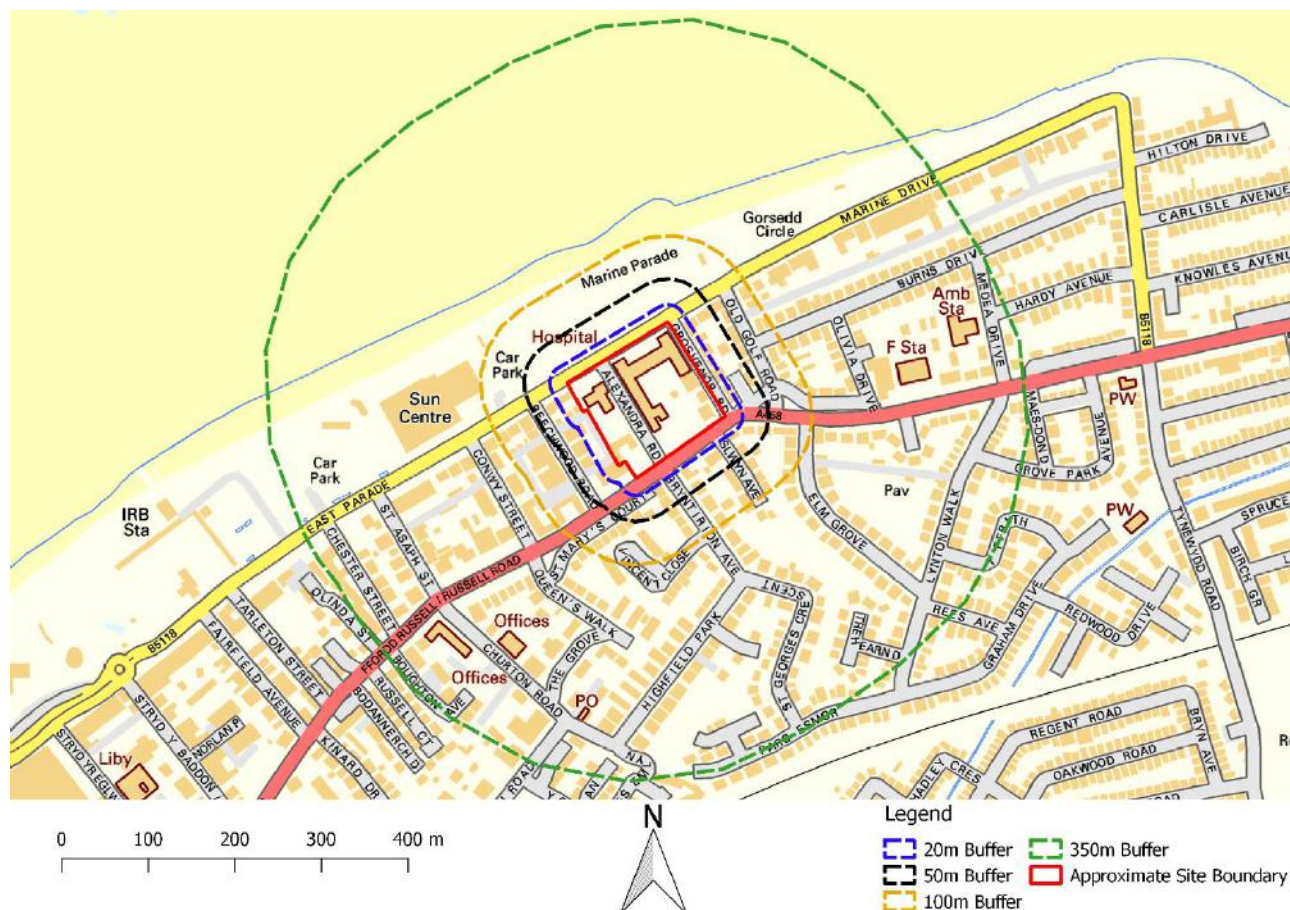


Figure 3: IAQM Construction and Demolition Band Criteria from the Application Site Boundary. Contains OS Data © Crown Copyright and Database rights 2020

The sensitivity of the area and the factors considered are detailed in Table 6.

Table 6: Sensitivity of the Area

Sensitivity Type	Factors	Sensitivity of Area	
		On – Site	Trackout
Dust Soiling	There are between 10 and 100 receptors, including residential dwellings, within 50 m of the Application Site that would reasonably expect to enjoy a high level of amenity. Without site-specific mitigation, trackout may occur on roads used by construction traffic up to 500 m from large development sites, as measured from the site exit, and up to 50 m from the edge of the road. There are more than 100 high sensitivity receptors within 50 m of the route to be used by construction traffic.	Medium	High
Human Health	The maximum background PM ₁₀ concentration at the Application Site during construction is estimated to be 8.9 µg/m ³ , based on 2021 mapped background estimates as presented in Table 3 and Table 4. There are between 10 and 100 human receptors within 50 m of the Application Site boundary, and more than 100 human	Low	Medium

Sensitivity Type	Factors	Sensitivity of Area	
		On – Site	Trackout
	receptors within 20 m of the trackout from the Application Site, where people could be exposed to PM ₁₀ for an extended period of time.		

5.1.4 Risk of Dust Impacts

The outcomes of the assessments of potential magnitude of dust emissions and the sensitivity of the area are combined to determine the risk of impact. This risk is then used to inform the selection of appropriate mitigation. Table 7 details the risk of dust impacts for demolition, earthworks, construction and trackout activities.

Table 7: Summary of Potential Unmitigated Dust Risks

Potential Impact	Sensitivity	Demolition	Earthworks	Construction	Trackout
		Magnitude			
		Small	Large	Small	Large
Dust Soiling Impacts	High	Medium Risk	High Risk	Low Risk	High Risk
Human Health Impacts	Medium	Low Risk	Medium Risk	Low Risk	Medium Risk

5.2 Construction Phase – Vehicular Pollutants.

The Application Site is not located within or adjacent to an AQMA and therefore the higher screening criterion (i.e. 500 LDV and 100 HDV) would apply.

Information on traffic movements anticipated during construction works was unavailable for the completion of the Air Quality Assessment. However, the development quantum is not anticipated to result in a significant increase in movements above the EPUK and IAQM criterion. The duration of movements will be short-term in nature and are not considered further within the context of this assessment. Therefore, in accordance with the criterion presented within EPUK and IAQM guidance, additional road vehicle trips during the construction phase of the Proposed Development “can be considered to have insignificant effects” on air quality.

5.3 Construction Phase – Non-road Mobile Machinery.

Pollutants emitted by NRMM that may have the most significant potential effects on local air quality are particulate matter (PM₁₀ and PM_{2.5}), and NO_x/NO₂. Typically, NRMM is associated with construction sites and, therefore there is a potential for NRMM emissions to adversely affect local air quality as a result of the Proposed Development.

However, LAQM.TG(16) guidance states that, with the application of suitable control measures and site management, exhaust emissions from on-site NRMM are “unlikely to make a significant impact on local air quality. In the vast majority of cases they will not need to be quantitatively assessed”.

6. Operational Phase Assessment.

The potential for air quality impacts during the operation of the Proposed Development are assessed in this section.

6.1 Road Traffic Emissions Screening Assessment.

Initial road traffic data associated with the Proposed Development has been provided by Curtins Consulting Ltd, the appointed Transport Consultants for the project.

The initial flows indicate that there will be a total daily (7 am – 9 pm) increase of 320 trips on the local road network as a result of the Proposed Development. This is calculated in line with the operational hours of the hospital, with minimal trips expected to be generated between 9 pm and 7 am. According to the Transport Assessment, this is considered to be a negligible change in traffic as, when compared to the eastbound flows along Russell Road, it falls comfortably within expected daily traffic variation.

The increase in traffic is below the indicative criteria in the EPUK and IAQM guidance of a change of more than 500 LDV trips and/or 100 HDV trips and therefore no further assessment is required and the impacts on air quality from operational phase traffic generation are considered to be not significant.

6.2 Site Suitability.

This section presents a review of DCC's monitoring data in the vicinity of the Application Site, for the purpose of identifying the suitability of the Application Site for hospital use and identify any requirements for potential mitigation to be embedded into the Proposed Developments design.

As presented in Section 2 in line with LAQM.TG(16), the annual mean, 24-hour mean, and 1-hour mean air quality objectives apply to the Proposed Development due to its proposed hospital use. As such, this section considers the annual mean, 24-hour mean, and the 1-hour mean pollutant concentrations at the Application Site.

6.2.1 Predicted NO₂ Concentrations

A review of the annual mean NO₂ concentrations monitored within the vicinity of the Application Site has been completed as part of the baseline review with recent monitoring results presented in Table 2.

The closest roadside passive diffusion tube to the Application Site is Wellington Road, Rhyl (ID: DBK1), located approximately 840 m to the south west on the A548, the main road along which the Application Site is situated. Due to its proximity and its location on the A548, the monitoring concentrations at Wellington Road are likely to be the most representative of the Application Site. NO₂ concentrations at this monitoring site have consistently achieved the annual mean AQO in the last five years, with concentrations averaging approximately 61 % of the objective.

An annual mean concentration of 60 µg/m³ or above is often used to indicate a possible exceedance of the 1-hour mean NO₂ objective. All diffusion tube monitoring locations within the vicinity of the Application Site have recorded NO₂ concentrations below 60 µg/m³ in the last five years, indicating likely compliance with the 1-hour mean objective.

Additionally, Defra predicted background concentrations at the Application Site, as shown in Table 3 and Table 4, are below the annual mean and 1-hour mean NO₂ objectives.

Therefore, NO₂ concentrations in the locale of the Proposed Development are expected to comply with the 1-hour mean and annual mean objectives, and the Application Site is considered suitable for hospital use without the inclusion of mitigation measures against NO₂ concentrations.

6.2.2 Predicted PM₁₀ Concentrations

The predicted Defra background concentrations for PM₁₀, as shown in Table 3 and Table 4, are below the 24-hour mean and annual mean PM₁₀ objectives. Therefore, PM₁₀ concentrations in the locale of the Proposed Development are expected to comply with the 24-hour mean and annual mean objectives, and the Application

Site is considered suitable for hospital use without the inclusion of mitigation measures against PM₁₀ concentrations.

6.2.3 Predicted PM_{2.5} Concentrations

The predicted Defra background concentrations for PM_{2.5}, as shown in Table 3 and Table 4, are below the annual mean PM_{2.5} objective. Therefore, PM_{2.5} concentrations in the locale of the Proposed Development are expected to comply with the annual mean objective, and the Application Site is considered suitable for hospital use without the inclusion of mitigation measures against PM_{2.5} concentrations.

6.2.4 Significance of Air Quality Impacts

To determine the significance of predicted air quality impacts based upon a site-suitability assessment, such as that undertaken as part of this assessment, the EPUK & IAQM guidance states:

“Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means.”

With regards to the Proposed Development, the unmitigated impact significance associated with the Proposed Development has been predicted in accordance with the stated assessment methodology. The following factors have been considered when providing justification:

- The Proposed Development will not introduce any new receptor into an area of exceedance of the 1-hour mean or annual mean NO₂ air quality objective based upon a review of NO₂ monitoring data within the development locale; and
- The Proposed Development will not introduce any new receptor into an area of exceedance of the 24-hour mean or annual mean PM₁₀ air quality objectives based upon a review of PM₁₀ monitoring data within the development locale.
- The Proposed Development will not introduce any new receptor into an area of exceedance of the annual mean PM_{2.5} air quality objective based up on a review of PM_{2.5} monitoring data within the development locale.

As no exceedances of the considered air quality objectives objective are predicted, mitigation measures are not required for the operational phase of the Proposed Development. As such, the overall effect is considered to be ‘not significant’.

7. Mitigation.

7.1 Construction Phase.

To mitigate the potential impacts during the construction phase it is recommended that mitigation measures as detailed in the IAQM guidance are implemented. These mitigation measures have been carefully selected for the Proposed Development and are based upon the dust risk categories outlined in Section 5.1.4 of this report.

It is recommended that DCC approve a Dust Management Plan (DMP) prior to works commencing on site, and that this is implemented using an appropriately worded planning condition. Table 8 below details the measures that should be incorporated in the DMP.

Table 8: Mitigation Measures

Issue	Mitigation Measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
Dust Management Plan	Develop and implement a Dust Management Plan (DMP), which may include measures to control emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real-time PM ₁₀ continuous monitoring and/or visual inspections.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the Local Authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
	Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked. This should include regular dust soiling check of surfaces such as street furniture, cars, window sills within 100 m of the site boundary, with cleaning to be provided if necessary.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by the IAQM on monitoring during demolition, earthworks and construction.

Issue	Mitigation Measure
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used cover as described below..
	Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles.
	Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the Local Authority, where applicable).
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimize drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	Avoid bonfires and burning of waste materials.
Demolition	Soft strip inside building before demolition.
	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
	Bag and remove any biological debris before demolition.

Issue	Mitigation Measure
	Avoid scabbling (roughening of concrete surfaces) if possible.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
	Only remove the cover in small areas during work and not all at once.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in continuous use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10 m from receptors where possible.

Potential dust effects during the construction phase are considered to be temporary in nature. The impacts are determined to be temporary as they will only potentially occur throughout the construction phase and short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine.

However, with the application of the above dust control and mitigation measures, it is considered that impacts at all receptors will be 'not significant' in accordance with the IAQM guidance.

7.1.1 Construction Phase Road Traffic Emissions

Potential air quality impacts associated with construction phase road traffic emissions, principally HDV movements, have been screened out for further assessment with associated impacts on air quality predicted to result in an 'insignificant' effect. Therefore, mitigation measures are not considered to be required.

7.1.2 Construction Phase NRMM Emissions

In accordance with Part 4 of the IAQM Control of Dust and Emissions guidance, all NRMM would need to adhere to the emissions standards for NO₂ and PM₁₀ set out for NRMM. It is therefore considered the likely effects of construction plant on local air quality would be insignificant.

7.2 Operational Phase.

7.2.1 Road Traffic Emissions

Potential air quality impacts associated with operational phase development trips have been screened out from further assessment as 'the impacts [on air quality from operational phase movements] can be considered to have insignificant effects' in accordance with the EPUK and IAQM Guidance. Therefore, mitigation measures are not considered to be required.

7.2.2 Baseline Site Suitability Review

A review of DCC's monitoring data in consideration of the Application Site, and mapped concentrations by Defra in the locale of the Application Site, indicates no likely exceedance of the 1-hour mean or annual mean NO₂, 24-hour mean or annual mean PM₁₀ or the annual mean PM_{2.5} air quality objectives.

As no exceedances of any considered air quality objective are predicted, this follows the 1st hierarchy principle of the IAQM guidance to 'prevent and avoid' exposure¹⁹. Therefore, no further mitigation measures are required.

8. Summary and Conclusions.

This report details the potential air quality impacts associated with the construction and operation of a proposed community hospital in Rhyl, North Denbighshire.

The findings of the assessment are as follows:

- A qualitative assessment of the potential dust impacts during the construction of the Proposed Development has been undertaken. Through good practice and implementation of appropriate mitigation measures, it is expected that the release of dust would be effectively controlled and mitigated, with resulting impacts considered to be 'not significant'. All dust impacts are considered to be temporary and short-term in nature;
- The results of the operational phase traffic screening assessment indicate that the traffic generated by the Proposed Development is below the EPUK and IAQM guidance criteria. The impact of the operational road traffic is therefore considered to be negligible; and
- A baseline site suitability review has been undertaken to assess the suitability of the Application Site for the proposed hospital use. NO₂, PM₁₀ and PM_{2.5} concentrations in the locale of the Application Site are considered to be in compliance with the 1-hour mean, 24-hour mean and annual mean objectives. Therefore, the Application Site is considered suitable for hospital use without the inclusion of mitigation measures.

Based on the information above, it is considered that air quality should not be viewed as a constraint to planning and the Proposed Development conforms to the principles of Planning Policy Wales and the DCC Local Plan.

9. Glossary of Terms.

AADT	Annual Average Daily Traffic
AQMA	Air Quality Management Area
AQO	Air Quality Objective
DCC	Denbighshire County Council
Defra	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EPUK	Environmental Protection UK
HDV	Heavy Duty Vehicles (> 3.5 tonnes gross vehicle weight)
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles (\leq 3.5 tonnes gross vehicle weight)
$\mu\text{g}/\text{m}^3$	Micrograms per cubic metre
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be $\text{NO}_2 + \text{NO}$)
NRMM	Non-Road Mobile Machinery
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM_{10}	Particulate matter with an aerodynamic diameter less than 10 micrometres
$\text{PM}_{2.5}$	Particulate matter with an aerodynamic diameter less than 2.5 micrometres
SMNR	Sustainable Management of Natural Resources
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
Trackout	The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site
WFG Act	Well-being of Future Generations (Wales) Act 2015

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- ¹⁸ British Geological Survey (2020), Geology of Britain 3D Viewer –[online] (Last accessed: 09/04/2020), Available at: mapapps.bgs.ac.uk/geologyofbritain3d/
- ¹⁹ IAQM Mitigation of Development Air Quality Impacts, Version 1.1 (June 2018).

Appendix 1 - EHO Consultation.

From: Emma Rigler
Sent: 14 April 2020 15:16
To: Andrew.lord@denbighshire.gov.uk
Cc: Kathryn Woolley
Subject: North Denbighshire Community Hospital - Air Quality Scope



Dear Andrew,

Hoare Lea have been instructed to undertake an air quality assessment for a proposed community hospital located adjacent to the Royal Alexandra Hospital, Rhyl, LL18 3AS. Please see below site location for reference.

The Proposed Development comprises the construction of the North Denbighshire Community Hospital, together with the refurbishment of the Royal Alexandra Hospital and landscaping works. The proposals also include the demolition of the existing Edith Vizard Dental Hospital, Glan Traeth Outpatients, Glan Traeth Ward, Mortuary and Estates buildings.

Hoare Lea propose to undertake the assessment using the following methodology:

- A baseline assessment will be undertaken using Denbighshire County Council's most recent Annual Status Report.
- Defra's background pollution maps will be used to establish background concentrations in the area.
- Both existing monitoring data and the Defra background maps will be used to qualitatively inform the suitability of the site for the Proposed Development.
- At present it is unclear whether the traffic generated by the Proposed Development will exceed the criteria set out in the EPUK/IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality/

January 2017. Therefore, a screening assessment will be undertaken and, if the screening thresholds are exceeded, the effect of road traffic emissions from the Proposed Development on existing and proposed receptors will be modelled using ADMS-Roads.

- It is understood that the Proposed Development will meet its energy demand through existing onsite provisions with no new combustion sources. Therefore, a detailed assessment of the impacts of emissions from combustion sources has been screened out of this assessment in line with the EPUK and IAQM guidance.
- The air quality assessment will also consider impacts during the construction phase of the development using the IAQM document 'Assessment of dust from demolition and construction' June 2016.

I would be grateful if you could please confirm your acceptance of the proposed methodology and provide me with any comments you may have.

In addition, if you could provide me with any monitoring data for Rhyl in 2019, and any local guidance relevant to air quality that is currently not online, that would be greatly appreciated.

If you would like to discuss further, please do not hesitate to contact me on the number below.

Many thanks,

Emma Rigler
Graduate Air Quality Consultant

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HOARE LEA 

Appendix 2 - IAQM Construction Phase Methodology.

The following tables have been taken from the IAQM guidance document 'Guidance on the Assessment of Dust from Demolition and Construction'¹⁵ and have been utilised to determine the sensitivity of the area and consider the risk of fugitive emissions as a result of construction activities.

Table 9 and Table 10 illustrate how the sensitivity of the area may be determined for dust soiling and human health, respectively. It should be noted that the highest level of sensitivity from each table should be considered, as recommended by the IAQM.

Table 9: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10 – 100	High	Medium	Low	Low
	1 – 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 10: Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10 – 100	High	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	28 – 32 µg/m ³	>100	High	High	Medium	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	24 – 28 µg/m ³	>100	High	Medium	Low	Low	Low
		10 – 100	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10 – 100	Low	Low	Low	Low	Low

		1 – 10	Low	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	28 – 32 µg/m ³	>10	Medium	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	24 – 28 µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
Low	-	1	Low	Low	Low	Low	Low

Table 11 to Table 14 illustrate how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk of impacts with no mitigation measures applied.

Table 11: Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 12: Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 13: Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 14: Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	High Risk	Low Risk
Medium	Medium	Low Risk	Negligible
Low	Low	Low Risk	Negligible

Appendix 3 - Professional Experience.

Chris Rush (Hoare Lea), BSc (Hons), MSc, PG Dip Acoustics, CEnv, MIOA, MIEMA, MIEEnvSc, MIAQM

Chris is a Senior Associate Air Quality Consultant with Hoare Lea. He is a Chartered Environmentalist, a Member of the Institute of Acoustics, a Full Member of the Institute of Environmental Management and Assessment, a Member of the Institution of Environmental Sciences and a Member of the Institute of Air Quality Management.

He has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Chris's expertise covers planning, noise and air quality, specifically in relation to residential developments, industrial fixed installations such as waste management centres and transportation environmental impact on developments including air traffic.

Kathryn Woolley (Hoare Lea), BSc (Hons), AMIEnvSc, MIAQM

Kathryn is a Principal Air Quality Consultant with Hoare Lea. She's is an associate Member of the Institution of Environmental Sciences and a Full Member of the Institute of Air Quality Management.

She has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Kathryn's expertise covers planning, and air quality, specifically in relation to residential developments, industrial fixed installations such as district heating networks. Kathryn has completed over 30 EIA in the past 6 years throughout the UK and abroad including; St Johns Masterplan in Manchester (residential led), Leicester City Football club training facility north of Leister (sports use), 1-5 Grosvenor Place, Westminster (mixed use residential, retail and hotel site), and Chestnut Avenue in Eastleigh (residential and community use).

Emma Rigler (Hoare Lea), MChem (Hons), AMIEnvSc, AMIAQM

Emma is a Graduate Air Quality Consultant with Hoare Lea. She graduated from the University of York with a Chemistry degree focusing on Resources and the Environment. Emma's MChem project involved monitoring and mitigating pollutants released during the manufacture of antiperspirant sticks, to prevent adverse effects on human health and the environment. Emma's interests lie in the chemical and photochemical interactions of pollutants throughout the atmosphere.



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