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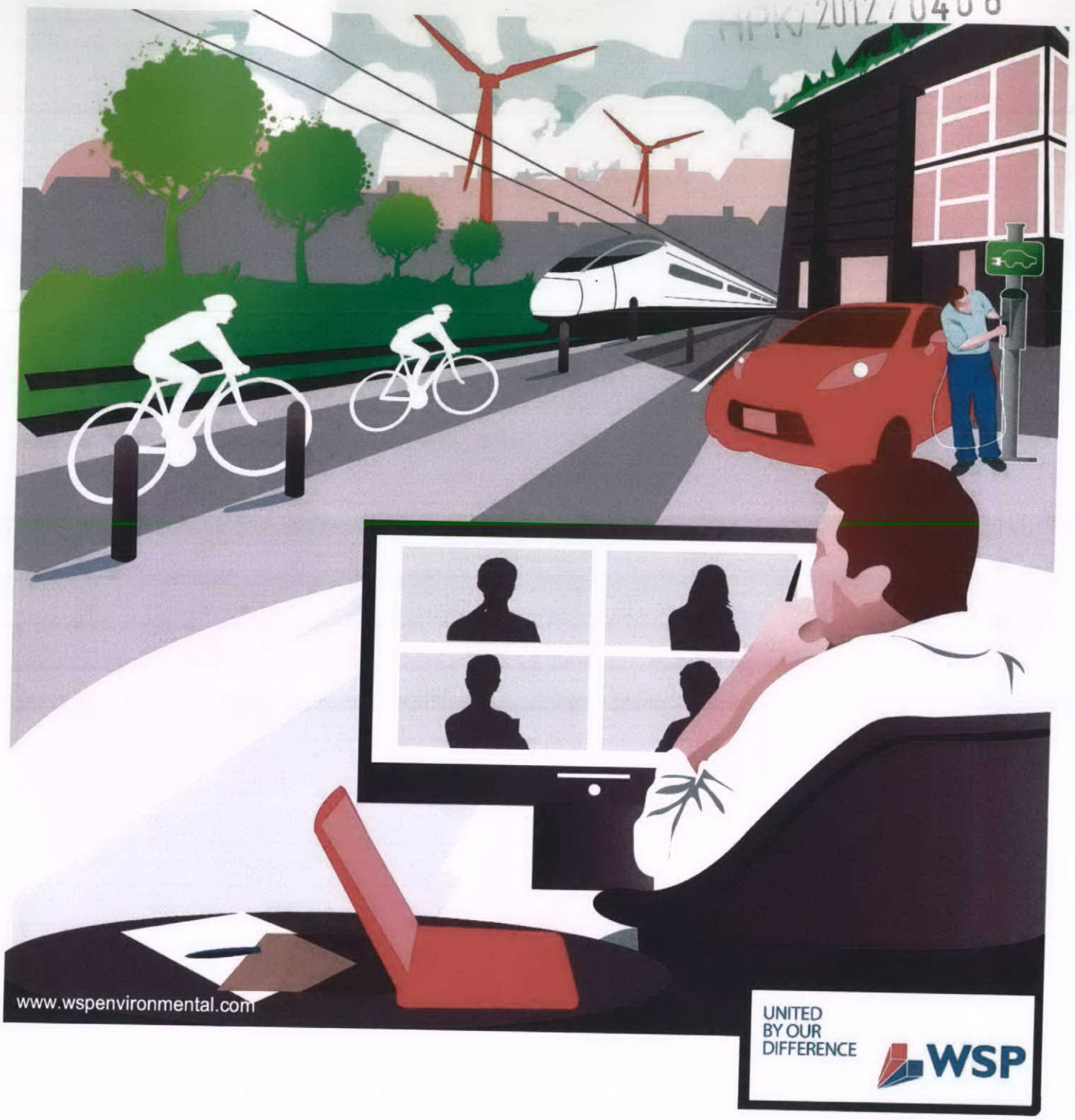

Air Quality Assessment Report: Chapel-en-le Frith

Heyrose Property Group

June 2012

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QUALITY MANAGEMENT

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 WSP Environmental Ltd (WSPE) has been commissioned to undertake a qualitative assessment of the potential air quality and odour issues at the proposed residential site on part of the Industrial Site, Hayfield Road.

1.1.2 The site is situated on the northern edge of the town of Chapel-en-le-Frith and adjacent to the south of the A624 Hayfield road. To the west is an industrial site and to the east is Burrfields Road beyond which is residential development. To the south of the site are the grounds of St Thomas Becket Church beyond which is further residential development.

1.1.3 The proposals comprise the demolition of part of the industrial site and the construction of approximately 160 residential dwellings. The proposed masterplan is shown in **Figure 1**.

1.1.4 This report considers the:

- Potential impacts of dust and PM_{10} on existing sensitive receptors from the demolition of existing buildings and the construction of the proposed residential units on the site. The potential cumulative construction dust and PM_{10} impacts from the consolidation of the adjacent industrial site will also be assessed; and the
- Potential impacts of existing dust, air emissions and odours from the adjacent industrial site given the consolidation of the site on existing and proposed receptors.

1.1.5 This report presents the findings of the assessment; where potential impacts are identified, the measures that should be employed to minimise these impacts are described.

2 RELEVANT LEGISLATION AND GUIDANCE

2.1 THE EUROPEAN AIR QUALITY FRAMEWORK DIRECTIVE AND DAUGHTER DIRECTIVES

2.1.1 The European Air Quality Framework Directive (Directive 96/62/EC) establishes a strategic framework for setting Europe-wide limit values for twelve pollutants. The pollutants sulphur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter less than 10 micrometres (μm) in aerodynamic diameter (PM_{10}), lead (Pb), carbon monoxide (CO), benzene (C_6H_6), ozone (O_3), polycyclic aromatic hydrocarbons (PAHs), cadmium (Cd), arsenic (As), nickel (Ni) and mercury (Hg).

2.1.2 Limit values for each pollutant are established by a series of Daughter Directives and are based on recommendations made by the World Health Organisation (WHO). Legally binding limit values for Member States to achieve have already been set for SO_2, NO_2, NO_x, PM_{10}, Pb, CO and C_6H_6. The European Commission is currently working on proposals for the remaining pollutants identified in the Air Quality Framework Directive.

2.1.3 The new Air Quality Directive 2008/50/EC came into force on the 11th June 2008. This new directive merged four existing Directives and one Council Decision into a single Directive on air quality. It also sets new standards and target dates for reducing concentrations of fine particles. Under the new Directive, Member States are required to reduce exposure to $PM_{2.5}$ in urban areas by an average of 20% by 2020 based on 2010 levels, and obliges them to reduce exposure levels below 20ug/m3 by 2015 in these areas. However, Air Quality Directive 2008/50/EC has not yet been transposed into English law.

2.1.4 Directive 2008/50/EC does however not include the legislation included within the 4th Daughter Directive which covers the pollutants Cd, As, Ni and PAHs. These will be brought within the Directive at a later date.

2.2 AIR QUALITY STRATEGY FOR ENGLAND, SCOTLAND, WALES & NORTHERN IRELAND

2.2.1 The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007[1]. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.

2.2.2 The AQS sets standards and objectives for nine main air pollutants to protect health, vegetation and ecosystems. These are C_6H_6, 1,3 butadiene (C_4H_6), CO, Pb, NO_2, particulate matter (PM_{10} and $PM_{2.5}$), SO_2, O_3, and PAHs.

2.2.3 The air quality standards are concentration limits which represent negligible or zero risk to health, based on medical and scientific evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). Above these limits sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

2.2.4 The air quality objectives are medium-term policy based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedences of the standard over a given period.

2.2.5 For some pollutants, (e.g. NO_2), there is both a long-term (annual mean) standard and a short-term standard. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

2.2.6 The AQS contains a framework for considering the effects of a finer group of particles known as '$PM_{2.5}$' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health affects than PM_{10}. For $PM_{2.5}$ the objectives will take the form of a limit value ('backstop objective') and an 'exposure reduction' target. Although a target for $PM_{2.5}$ is included in the AQS, these objectives have not yet been incorporated

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) – July 2007.

into the Regulations. Consequently there is currently no requirement for local authorities to assess this pollutant as part of their statutory obligations.

2.3 AIR QUALITY (ENGLAND) REGULATIONS

2.3.1 Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000[2] and the Air Quality (England) (Amendment) Regulations 2002[3] for the purpose of Local Air Quality Management (LAQM). The standards and objectives for each pollutant in the AQS and the Regulations are given in **Appendix A**.

2.4 THE ENVIRONMENTAL PROTECTION ACT 1990 - CONTROL OF DUST AND PARTICULATES ASSOCIATED WITH CONSTRUCTION

2.4.1 Section 79 of the Environmental Protection Act 1990 gives the following definitions of statutory nuisance relevant to dust and particles:

- 'Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance', and
- 'any accumulation or deposit which is prejudicial to health or a nuisance'.

2.4.2 Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

2.4.3 There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

2.5 LOCAL AIR QUALITY MANAGEMENT (LAQM)

2.5.1 Under Part IV of the Environment Act 1995, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives by the years defined in the Regulations. Where the objectives of the Air Quality Regulations are not likely to be achieved by the objective year, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

2.5.2 The Department for Environment, Food and Rural Affairs (DEFRA) has published technical guidance for use by local authorities in their review and assessment work[4].

High Peak Borough Council's review and assessment of air quality

2.5.3 High Peak Borough Council (HPBC) has not declared any AQMAs within their administrative area as part of their review and assessment work.

2.6 ENVIRONMENTAL PERMITTING REGULATIONS (EPR) HORIZONTAL GUIDANCE NOTE H1

2.6.1 Annex F of the Environment Agency's (EA) Horizontal Guidance Note H15 provides a number of Environmental Assessment Levels (EALs) for pollutants that are not included in the Air Quality Regulations. EALs for

[2] The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928

[3] The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043

[4] Department for Environment, Food and Rural Affairs (DEFRA): *Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(09)* (Feb 2009).

Antimony (Sb) and ammonia (NH_3), hydrogen chloride (HCl), particulates (PM_{10}) and volatile organic compounds (VOCs) including trichloroethylene, are contained in the Guidance Note.

2.7 NATIONAL PLANNING POLICY

National Planning Policy Framework

2.7.1 The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It promotes sustainable development and opportunities for local communities to engage in plan making at a neighbourhood level. The core underpinning principle of the framework is the presumption in favour of sustainable development, defined as: *'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'* One of the 12 core planning principles in the NPPF is that planning should *'contribute to conserving and enhancing the natural environment and reducing pollution.'*

2.7.2 In relation to air quality, the document states that:

- 'Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan';
- 'The planning system should contribute to and enhance the natural and local environment by:...preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soils, air, water, or noise pollution..';
- 'In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment. Plans should allocate land with the least environmental or amenity values, where consistent with other policies in this Framework.'
- '..local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should to be revisited through the permitting regimes operated by pollution control authorities'; and
- 'Local Planning authorities should consider where otherwise unacceptable development could be made acceptable though the use of conditions or planning obligations. Planning Obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.'

2.8 LOCAL PLANNING POLICY

High Peak Saved Policies Local Plan (2008) (saved polices)

2.8.1 HPBC Policy GD5 – Amenity states that...

'Planning permission will be granted for development provided that:

- It will not create unacceptable loss of, nor suffer from unacceptable levels of, privacy or general amenity, particularly as a result of:
    - Overlooking;
    - Loss of daylight and sunlight;
    - Overbearing effects of development;
    - Air, water, noise, light and other pollution;
    - Risk from hazardous substances and processes;

[5] Horizontal Guidance Note H1, Environment Agency – Annex F (April 2010)

- Traffic safety and generation.

- Where appropriate conditions will be imposed and/or planning obligations sought, to ensure amelioration measures are taken to adequately address the impacts on amenity.

3 SCOPE AND METHODOLOGY

3.1 SCOPE

3.1.1 The scope of the assessment has been determined in the following way:

- review of HPBC review and assessment reports;
- review of air quality data for the area surrounding the site, including data from DEFRA[6] and the Environment Agencys' websites (EA)[7];
- desk study to confirm the location of nearby areas that may be sensitive to changes in local air quality; and
- review of the existing information including the Environmental Permit information, odour complaints data and relevant manufacturing information which has been used for the qualitative assessment.

3.2 METHODOLOGY

Construction phase

3.2.1 During the construction phase, activities undertaken on the application site may cause dust and particulate matter to be emitted to the atmosphere.

3.2.2 Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emission. Dust therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

3.2.3 The smaller particles of dust (typically less than 10μm in aerodynamic diameter) are known as particulate matter (PM_{10}) and represent only a small proportion of total dust released. As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, and can therefore be transported by wind over a wider area. PM_{10} is small enough to be drawn into the lungs during breathing, which in sensitive members of the public could cause an adverse reaction. As a result of this potential impact on health, standards and objectives for PM_{10} are defined in the AQS and Regulations.

3.2.4 A qualitative assessment of the potential impacts due to the generation and dispersion of dust and PM_{10} during the construction phase has been undertaken using information in guidance documents produced by the following organisations:

- Building Research Establishment (BRE)[8];
- Quality of Urban Air Review Group (QUARG)[9];
- Department of the Environment (DoE)[10]; and
- Institute of Air Quality Management (IAQM).

3.2.5 The following potential impacts of increased dust and PM_{10} generated during the construction phase have been considered:

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[6] http://laqm1.defra.gov.uk/review/tools/background.php

[7] http://www.environment-agency.gov.uk

[8] Kukadia, V., Upton, S. L. and Hall, D. J.; *Control of dust from Construction and Demolition Activities.* BRE (Feb 2003).

[9] Quality of Urban Air Review Group: *Airborne Particulate Matter in the United Kingdom – Third Report of the Quality of Urban Air Review Group.* Prepared for the Department of the Environment (May 1996).

[10] Arup Environmental and Ove Arup and Partners: *The Environmental Effects of dust from Surface Mineral Workings Volume 2.* Prepared for Department of the Environment Minerals Division (Dec 1995).

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM_{10}.

3.2.6 **Appendix C** summarises the assessment procedure given in the guidance published by the IAQM for the consideration of potential dust and PM_{10} impacts from demolition; earthworks; general construction activities and track-out. The IAQM guidance requires the significance of impacts associated with the construction phase of the proposed development be determined qualitatively by identifying and understanding:

- the size of the site, and the area of which construction activities are likely to take place;
- the construction activities associated with the proposed development that could generate dust and PM_{10} and their likely duration;
- the proximity and type of sensitive receptors (e.g. schools, residential properties) to the construction site boundary;
- the local meteorological conditions (wind speed, direction and rainfall) in the area in which the site is located;
- the current PM_{10} concentration in the area in which the site is located;
- the presence of vegetation surrounding the site, which might act as a buffer; and
- the potential distance which the construction traffic will travel across unpaved roads on the construction site, prior to accessing the local road network (referred to as 'trackout').

Operational phase

3.2.7 The proposed development is located adjacent to an existing industrial site and the potential dust, air quality and odours from the processes on this site will be considered.

3.2.8 The primary polluting substances emitted to air from the process are Sb, HCl, NH_3, particulates and VOCs including trichloroethylene. Such polluting substances may affect human health; ammonia may also affect ecological receptors. As a result of this potential impact on health; standards and objectives for each of these pollutants are defined in the AQS and Regulations and or included as standards in the Environment Agency's H1 Guidance Note.

3.2.9 Dust is also emitted, the effects of which are described above. Odours are also generated from the process. The release of odours to the atmosphere may be considered as a nuisance to surrounding sensitive receptors. The dispersion of odours is dependent on the intensity of the odour, the local meteorological conditions, the sensitivity of the receptor, and the proximity of the receptor to the source of odour. Whether an odour causes a nuisance is subjective and depends on the perception of the sensitive receptor to the odour.

3.2.10 The assessment of air emissions, dust and odour will be undertaken qualitatively through a review of the existing information including the Environmental Permit information, relative positioning of sensitive receptors, a review of the proposed site consolidation processes, previous complaints data and relevant manufacturing information.

3.3 SENSITIVE RECEPTORS

3.3.1 Sensitive locations are those where the public may be exposed to pollutants from the Site. These will include locations sensitive to an increase in dust deposition as a result of on-site construction activities, or exposure to gaseous pollutants from exhaust emissions from construction site traffic and traffic associated with the proposed development, once it becomes operational.

3.3.2 Examples of locations that are sensitive to dust and particulate matter generated by construction activities are shown in **Table 1** below. This table is based on a table of examples provided in the guidance published by IAQM.

Table 1: Examples of Receptor Sensitivity to Construction Phase Impacts

Sensitivity of Area	Examples	
	Human Receptors	Ecological Receptors[1]
Very High	Very densely populated area	European Designated Site

Sensitivity of Area	Examples	
	Human Receptors	Ecological Receptors(1)
	More than 100 dwellings within 20m Local PM_{10} concentrations exceed the objective Very sensitive receptors nearby (e.g. hospitals) Construction works continuing in one area of the site for more than 1 year	
High	Densely populated area 10-100 dwellings with 20m of the site Schools, Hi Tech & Food Processing industries nearby Local PM_{10} concentrations are within 10% of the objective Commercially sensitive horticultural land within 20m	Nationally Designated Site
Medium	Suburban of edge of town area Less than 10 receptors within 20m Local PM_{10} concentrations between 10-25% below the objective	Locally Designated Site
Low	Rural area/industrial area No receptors within 20m Local PM_{10} concentrations are below 75% of the objective Wooded area between site and receptors	No designations

(1) Only if there are ecological habitats present that may be sensitive to an increase in dust and particulate deposition.

3.3.3 The site is located on the edge of Chapel-en-le-Frith. Sensitive receptors within 500m of the site include residential properties, and a food retail outlet. There are approximately 20 dwellings within 20m of the site boundary. There are no designated ecological sites within 350m of the site boundary. Local PM_{10} concentrations are approximately 30% of the objective. Overall, the site is considered to be of medium sensitivity.

3.3.4 In terms of locations that are sensitive to gaseous pollutants emitted from engine exhausts, these will include places where members of the public will be exposed to pollution over the period of time that they are present, and therefore the most suitable averaging period of the pollutant needs to be used for assessment purposes. For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard (i.e. 15 minute mean or 1 hour mean) may be relevant. In a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as 24 hour mean or annual mean) may be more appropriate. In general terms, long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time. Ecological receptors can also be sensitive to gaseous emissions.

3.3.5 Sensitive receptors located in the vicinity of the site include residential areas immediately to the south and east, interspersed farm properties beyond in all directions, and Warnbrooke Primary School to the south east as well as the proposed residential development itself.

3.3.6 There are a number of ecological designated sites in the vicinity of the site as detailed in the permit reports including the:

- Peak District Moors Special Protection Area (SPA),
- Peak District Dales Special Area of Conservation (SAC),
- South Pennine Moors SAC, Waterswallows Quarry Site of Special Scientific Interest (SSSI),
- Wye Valley SSSI,
- The Dark Peak SSSI,
- Monks Dale SSSI,

- Leek Moors SSSI, Portway Mine SSSI,
- Dirtlow Rake and Pindale SSSI,
- Topley Pike and Deep Dale SSSI,
- Duchy Quarry SSSI, Poole's Cavern and Grin Low Wood SSSI, T
- oddbrook Reservoir SSSI,
- Lee Farm Meadow SSSI, Combs Reservoir SSSI,
- Edale SSSI, Castleton SSSI, Goyt Valley SSSI,
- Tideslow Rake SSSI, and
- Oxlow Rake SSSI.

4 EXISTING CONDITIONS

4.1 LOCAL EMISSION SOURCES

4.1.1 Sources of emissions include road transport as a number of roads (such the A6 and Hayfield Road) pass close to the site. There are three Part $A1_{11}$ industrial pollution sources in the immediate vicinity of the site. These include the industrial site to the west of the site which produces a range of brake components for use in the automotive and transport industries. The process involves the blend of raw materials, forming to shape, curing, machining and the fitting of ancillary parts, dependent on customer specification. Emission from this site are discussed in more detail in section 5. The other two processes include a water process located approximately 740m to the north west of the site operated by United Utilities water Plc and a coating, printing and textiles located approximately 1.2 km North West of the site operated by Richbridge Ltd. During 2003, the only year data is available for, the Richbridge Ltd site did not make any notifiable releases to air, i.e. above limits prescribed in their authorisation. Air emissions from this site are unlikely to significantly influence local air quality at the site.

4.2 BACKGROUND AIR QUALITY DATA

4.2.1 Background concentrations for the site area are shown in **Table 2** for information.

Table 2:Estimated background concentrations for the site (µg/m^3)

Pollutant	Latest Year Data Available	Concentration	Source	Relevant AQS objective / EAL
PM_{10}	2010	15.15	DEFRA website - 2010 background maps	40
HCl	*No data available			750
VOC's As Toluene	**No data available			1910
Antimony	No data available			5
Ammonia	2009	1.04	DEFRA website for rural heavy metals - Wardlow Hay Cop	180 (human receptors) 1 or 3 (depending on sensitivity of ecological receptor)

*The Casella Stanger (July 2005) *'Atmospheric dispersion Modelling for IPPC Application'* report used a background concentration of 2.5µg/m^3 for the assessment which was agreed with the EA.

*The Casella Stanger (July 2005) *'Atmospheric dispersion Modelling for IPPC Application'* report used a background concentration of 5µg/m^3 for the assessment.

4.2.2 The table above shows that for all years estimated background concentrations for all pollutants are below the relevant AQS objective / EAL. This is with the exception of ammonia which is very slightly over the 1µg/m^3 EAL for sensitive ecological receptors.

4.3 LOCAL AIR QUALITY MONITORING DATA

4.3.1 Monitoring data within the site is available for NO_2 only. Concentrations of NO_2 measured within 10km of the proposed development site are provided in **Table 3** for information.

[11] Large scale industrial processes requiring authorisation from the Environment Agency.