PROPOSED THEWLIS LANE QUARRY, CROSLAND MOOR HUDDERSFIELD

ENVIRONMENTAL IMPACT ASSESSMENT

Prepared by

SILKSTONE ENVIRONMENTAL LTD.

On behalf of

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1.0 INTRODUCTION

1.1 Background

1.1.1 Silkstone Environmental Ltd on behalf of Johnsons Wellfield Quarries has prepared this Environmental Statement (ES) at the request of Kirklees Council in order to determine this planning application in accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, SI 1999 No. 293 for the extraction of sandstone on land at Thewlis Lane, Crosland Moor, Huddersfield.

1.1.2 Johnsons Wellfield Quarries (JWQ) is part of the Myers Group and has been producing natural stone products in Kirklees continuously since 1850 and is one of the longest established businesses in Kirklees.

1.1.3 JWQ employs 100 people directly and the Myers Group approximately 350. JWQ makes a large contribution to the local economy in the Kirklees area and are one of the foremost suppliers of engineered natural stone products in Britain.

1.1.4 The proposals involve the extraction of 200,600 tonnes of sandstone block, which will be excavated over a period of 8 years in a phased manner and restored progressively to minimise the impact of the proposals. The application site extends to 4.3 Hectares in total, of which all is currently in agricultural/pasture use.

1.1.5 This statement provides an overview of the proposed site and relevant land issues in order to clarify the proposed working method, environmental protection, landscaping, and restoration proposals.

2.0 SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

2.1 Introduction

2.1.1 Environmental Impact Assessment (EIA) is the process culminating in the production of this report, the Environmental Statement (ES). It is the identification and evaluation of all significant, direct and indirect effects of the proposals, during both construction and operation, on the environment.

2.1.2 The scope, or requirements, as to the contents of an ES are set out in Schedule 4 to the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended). Part 1 of the Schedule is information that the applicant is reasonably required to provide, Part 2 is information that must be required. They state:

Part 1

1. Description of the development, including in particular:

(a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;

(b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;

(c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.

2. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.

3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:

(a) the existence of the development;
(b) the use of natural resources;
(c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the

forecasting methods used to assess the effects on the environment.

5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.

7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

Part 2

1. A description of the development comprising information on the site, design and size of the development.

2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.

3. The data required to identify and assess the main effects which the development is likely to have on the environment.

4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.

5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.

2.1.3 Under Regulation 10 of the aforementioned Regulations, potential applicants may request a Scoping Opinion from the local planning authority. This is a written confirmation as to the information that would need to be provided in the proposed ES.

2.2 Screening Opinion

2.2.1 Under the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, as amended by the Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000, an EIA is mandatory for new mineral extraction sites, therefore no screening opinion was requested for this application.

2.3 Scoping Opinion

2.3.1 The Department of the Environment publication 'Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment' (HMSO 1995) defines scoping as:

"An initial stage in determining the nature and potential scale of the environmental impacts arising from the proposed development and assessing what further studies are required to establish their significance."

2.3.2 A Scoping Opinion was requested of Kirklees Metropolitan Council on the 15th February 2011 and a response was received on the 30th March 2011.

2.3.3 Key issues were highlighted under the following headings:

- Noise and Dust
- Ecology
- Improved habitat Provision
- Highways
- Loss of Agricultural Land

2.4 Public Consultation

2.4.1 Public consultation events were held to present the development proposals, hold discussions with the public and allow comment as necessary. The consultation events were held on the 9th at 11th of August 2012 at Johnsons Wellfield Quarries offices and were attended by 80 local residents over the two days.

2.4.2 Following the exhibitions, public comments were used as a basis to incorporate modifications and additional environmental mitigation measures into the planning application prior to submission.

2.4.3 Environmental concerns were raised, in particular to noise and dust nuisance. Other concerns raised regarded the advance planting proposed which would block out certain open views over the site from a number of properties. These comments were taken into consideration and amendments to the scheme have been made as a result of the feedback received from the public consultation meeting.

2.5 Structure of the Environmental Statement

2.5.1 The format of this Environmental Statement is as follows:

Section 1:	Introduction
Section 2	Scope of the Environmental Impact Assessment
Section 3:	The Applicants
Section 4:	Needs & Alternatives
Section 5	Existing Site Description
Section 6:	Exploration, Geology & Reserves
Section 7:	The Proposals
Section 8:	Environmental Considerations
Section 9	Archaeology
Section 10	Restoration
Section 11	Cumulative Impact
Section 12	Economic Impact
Section 13	Planning Policy

2.4.2 The Environmental Statement covers a large number of issues and, in doing so, utilises a significant quantity of technical terms.

2.4.3 A Non Technical Summary of the ES is also provided which forms a standalone document, written to summarise the proposals and enable members of the public, without specialist knowledge of the mineral industry and the planning process, to understand the basis of the application and the likely effects upon the environment.

2.4.4 Hard copies of the Environmental Statement (ES) may be purchased for £150, Technical Appendices for £100 or a full copy of the ES and Technical Appendices on CD for £5 (all exclusive of VAT). No charge will be made for copies of the Non Technical Summary.

2.4.5 Anyone wishing to acquire copies of either document should contact Mark Barrett at:

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email: mbarrett@silkstoneenvironmental.co.uk

3.0 THE APPLICANT

3.1 Overview

3.1.1 Johnsons Wellfield Quarries (JWQ) is part of the Myers Group and has been producing natural stone products in Kirklees continuously since 1850 and is one of the longest established businesses in Kirklees.

3.1.2 JWQ employs approximately 100 people directly. JWQ has contributed hugely to the economic development of Kirklees and are one of the foremost suppliers of engineered natural stone products in Britain. The company operates from Crosland Hill where the processing of stone is undertaken using mineral extracted from its nearby workings. The Crosland Hill works is one of the largest and best equipped dimension stone working plants in Europe. Significant and continued investment in the most advanced stone working machinery and quarry plant has enabled the company to remain firmly at the forefront of the UK dimension stone industry.

3.1.3 The company processes approximately 60,000 cubic metres of York Stone products per annum. Reserves of high quality stone from its existing sites are close to exhaustion and the company now seeks planning permission for further sites to secure the long term future of the company.

3.1.4 The company employs a team of locally based professional and technically experienced staff, backed by highly skilled craftsmen who ensure excellent standards of workmanship and service are continually achieved. To operate in a sustainable manner and to be able to provide highly engineered products, JWQ has made significant investments in technology, plant and training.

3.1.5 Johnsons Wellfield Quarries are committed to:

- The development of management systems and certification to BS EN ISO 14001 & BES 6001 (Environment and Responsible Sourcing standards respectively)
- Sustainability Management - working with the Local Community, Government & The British Research Establishment (BRE) to enhance current performance and reduce CO2 emissions
- Governance and Business Ethics
- Working with Local Communities
- Environmental Performance
- Responsible Sourcing & Procurement

3.1.6 The Company strives to conserve natural habitats for flora and fauna and is committed to creating, where possible, areas of natural beauty by sympathetic land restoration after quarrying operations have ceased, thus retaining the recognised landscape characteristics of the surrounding countryside.

3.1.7 The Company's Environmental Policy is under constant review and environmental targets are regularly assessed and monitored to ensure best practice is promoted and maintained.

3.1.8 The Company has already undertaken significant areas of restoration on previously quarried areas around the Crosland Moor area. Throughout this ongoing commitment to restoration, the company has experience and capacity to undertake restoration schemes to the highest standards.

3.2 Stone Products

3.2.1 The Crosland Hill Yorkstone is a millstone grit series sandstone which is an extremely hard, durable medium to fine grained true Yorkstone, light buff in colour and is available in a variety of finishes including the traditional Shot Sawn finish which is unique to Johnsons Wellfield Quarries.

3.2.2 The naturally occurring colour variations are enhanced by the subtle weathering and maturing of the stone.

3.2.3 The high compressive strength and renowned durability together with its traditional appearance enables it to work successfully in every conceivable location and with every style of building, a natural choice for many applications where technical specification is equally important to aesthetic appearance.

3.2.4 Crosland Hill Hard Yorkstone has been supplied to some of the country's most prestigious projects. Recently an architect commented of the stone "Crosland Hill is about the most beautiful Yorkstone currently available".

3.2.5 Crosland Hill Multi - A millstone grit series sandstone of the Carboniferous age. An extremely hard, durable medium to fine grained true Yorkstone, generally buff in colour with grey/blue colour variations.

3.3 Planning History

3.3.1 Dimension stone has been extracted from the Rough Rock on Crosland Moor for over one hundred and fifty years and Johnsons Wellfield Quarries Limited have been operational on the site since 1928.

3.3.2 JWQ are currently extracting sandstone at two quarries under planning permission 2003/62/91691/W0 at Crosland Moor and Waterholes Quarry Ref 92/62/05699/W0. The current situation in terms of planning permissions is detailed below.

Crosland Moor Quarry (also known as Airfield Quarry)

3.3.3 Crosland Moor Quarry operates under planning permission, Ref 2003/62/91691/W0 for the extraction of sandstone. A Section 73 planning application was submitted in 2009, Ref 2009/93289 for a variation of conditions 3, 9, 16 & 25 to allow a minor extension to mineral extraction which was granted on the 28th September 2012.

3.3.4 Generally the site consists of 6 phases of working, proceeding from phases 1 to 6 in a clockwise progression.

3.3.5 Phases 1 to 3 have already been worked and restored. Mineral extraction is currently being carried out in phase 4 at the site. Topsoil and subsoil have been stripped from Phase 5 in preparation for extraction of mineral.

3.3.6 The site covers an area of approximately 20 hectares (ha) of which approximately 9 ha has been worked and restored to date. Extraction is required by planning permission 2003/62/91691/W0 to have ceased, and the site fully restored by 31st December 2021 but at the current rates of extraction will be completed well in advance of this.

Waterholes Quarry

3.3.7 The quarry is currently being worked under planning permission 92/62/05699/W0, granted 22nd December 1992 for mineral extraction and restoration by landfilling. The planning permission was then varied by way of a section 73 planning application (ref: 2002/70/92247/W0) which was granted on the 7th November 2002.

3.3.8 Mineral extraction at the site is planning permitted until 31st October 2027 but reserves are now all but exhausted.

3.3.9 A Planning Obligation was agreed between Johnson Wellfield (Quarries) Ltd and Kirklees Metropolitan Council (dated 9th June 2006) under Section 106 of the Town and Country Planning Act 1990, The Section 106 Agreement ensures the satisfactory restoration of the existing quarries operated at Crosland Moor.

3.3.10 Waterholes Quarry is to be worked until the mineral is fully extracted from the site. The void from the quarrying operations is then to be filled by landfilling with inert waste from off-site sources in accordance with an Environmental Permit.

4.0 NEEDS & ALTERNATIVES

4.1 Overview

4.1.1 The remaining reserves at JWQ's current operational quarries are becoming close to exhaustion. It is, therefore, essential that further sites are found to provide a consistent and steady supply of block stone for the future of the operations, quarry staff and economic viability.

4.1.2 JWQ provides full time employment for 100 members of staff, the majority from the local surrounding area who, in turn, contribute to the multiplier effect securing additional jobs in the associated transport and building industries of the area. If the application is approved, the number of employees will have job security for the lifetime of the scheme.

4.1.3 The stone found in the proposed site is of a very high quality and is highly sought after. There are very few quarries in the country who supply dimension stone products of such high quality and it is of local and national significance that a continued supply of this mineral is available in terms of employment and the continued availability of a high quality resource.

4.1.4 The availability of the raw material is the most important aspect of JWQ's business. The company presently has planning approval to work just one quarry. Remaining reserves here will last for between just two and three years.

4.1.5 Appropriate mineral is available only within a limited area of south west Kirklees, determined by the geology of the area and other land uses.

4.1.5 Focusing attention specifically on the mineral that has traditionally been associated with JWQ, this has been extracted from an area that is reasonably local to JWQ's primary base at Crosland Hill on the western edge of Huddersfield. This is important for a number of reasons:

- Good reserves of mineral of appropriate quality and quantity exist in and around this area
- Besides being the type of mineral that is traditionally associated with the company, it is a material that is ideally suited to building use, from local vernacular schemes to the most prestigious projects in any location.
- The prime mineral is finely grained and enables the engineering expertise of the company to be shown to full advantage in the complex ashlar sections and large sculptural pieces it is capable of manufacturing
- Using mineral sourced from quarries local to the company's engineering plant involves a lower carbon footprint than if using mineral transported from further afield. Traffic movements and journeys are minimised with all the attendant benefits.

4.2 Markets

4.2.1 The existing Crosland Moor Quarry provides sandstone products across Yorkshire and nationwide, which therefore, provides a significant and strategically valuable source of sandstone on both a sub-regional and regional basis. The release of additional reserves proposed by this planning application will ensure the continuation of supply to meet established demand.

4.2.2 JWQ is an important business within Kirklees. JWQ supplies engineered natural stone products for construction and hard landscaping projects in the new build, refurbishment and conservation sectors.

4.2.3 JWQ's business is now prioritised within its dimension stone operation and significant investment in new saws and processing plant has ensured that they are able to maintain their position as a market leader.

4.2.4 The National Planning Policy Framework (NPPF) emphasises the importance of safeguarding and maintaining the supply of building stone for the conservation of built heritage and the restoration of historic buildings, particularly where stone is scarce in terms of its technical properties or aesthetic characteristics, or has characteristics which match those required for repair and preservation purposes of culturally important buildings.

4.2.5 Whilst dimension stone products are widely available throughout the country, the nature and quality of stone extracted from the Crosland Moor Quarries makes the sandstone products highly sought after. This is a factor of the character, texture, colour and appearance of the stone won.

4.2.6 On a national level, The British Geological Survey Mineral Planning Factsheet (2007) on Building and Roofing Stone provides an overview on natural building stone and roofing stone extraction in the UK.

4.3 Symonds Report

4.3.1 We believe that the general need argument for natural stone for building is very well made and set out in the report "Planning for the Supply of Natural Building and Roofing Stone in England and Wales" published by the Office of the Deputy Prime Minister in 2004.

4.3.2 This report, often referred to as the Symonds Report, records the growth of the importance of indigenous building stone to England and Wales and the rearguard action that the industry has fought in recent years against imported stone.

4.3.3 It points out both the profligate use of energy involved in imported stone as well as the fact that such material will often, by definition, be out of keeping within a British context.

4.3.4 Because of the many difficulties faced by operators within England and Wales, the report states that there is: "need for positive action to encourage both the continued operation of existing building stone quarries, and the opening of new quarries where appropriate, by ensuring that no unnecessary burdens are placed upon them by the planning system."

4.3.5 The report also acknowledges and stresses that the dimension stone sector of the minerals industry is very different from the aggregates sector, but that it is the latter that receives most of the publicity surrounding minerals and that this tends to colour the public's overall picture of the industry. National minerals planning guidance nowadays acknowledges the key difference in these two parts of the industry and distinguishes between these two disparate sectors.

4.3.6 The proposed development seeks to provide continuity of sandstone production for JWQ for approximately 8 years from a predicted start date in mid to late 2014 when reserves within the current working area are exhausted.

4.3.7 The Quarry is considered by JWQ to be a strategically important quarry, making a large and vital contribution to the supply of sandstone products in the Kirklees area and the wider region.

4.4 Employment

4.4.1 JWQ have been actively extracting sandstone from the area since the 1980's when the former site operator was acquired. The Company has therefore been an important local employer of a skilled industrial workforce for many years. It presently provides employment for 100 full-time staff and a large additional number of support and down-stream personnel working in the building materials industry. There is therefore a need for the Scheme in terms of local employment and the retention of this full time workforce.

4.5 Life of Existing Operations

4.5.1 It is estimated the Crosland Moor Quarry has sufficient reserves remaining at current levels of production until mid to late 2014. It is therefore necessary by grant of a new planning permission for this site to secure additional reserves to provide continuity of extraction beyond this date.

4.6 Alternative Sites

4.6.1 Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended 2008) sets out the information for inclusion in Environmental Statements and indicates that this should include:

"an outline of the main alternatives studied by the applicant ….. and an indication of the main reasons for his choice, taking into account the environmental effects."

4.6.2 Circular 2/99 "Environmental Impact Assessment" is also relevant when considering alternative options. This accompanies the Regulations and is intended to assist developers and planning authorities in their proper interpretation. This states at paragraph 83:

"Where alternative approaches to development have been considered paragraph 2 of Part II of Schedule 4 now requires the developer to include in the ES an outline of the main ones and the reason for his choice.

Although the Directive and the Regulations do not expressly require the developer to study alternatives, the nature of certain developments and their location may make the consideration of alternative sites a material consideration …"

4.6.3 It is therefore clear that whilst the consideration of alternatives is not mandatory, it may be a material consideration in particular circumstances.

4.6.4 There is no statutory EIA definition of 'alternatives' and so it is open to interpretation and is usually taken to be the examination of alternative approaches to deliver the scheme objectives and alternative sites, processes or management.

4.6.5 This section appraises the potential of a number of sites in Kirklees for the working of Rough Rock sandstone for the purposes of dimension stone production. It sets out planning and environmental criteria considered to be the key factors in determining the suitability of a prospective site

4.6.6 Policy M3 of the adopted Kirklees Unitary Development Plan sets out the criteria against which all proposals will be considered as follows:

M3: Proposals to explore for or to extract minerals will be permitted provided that they would not:

i) cause unacceptable detriment to landscape or local visual amenity during or subsequent to extraction;
ii) be materially detrimental to interests of nature conservation, cultural heritage, geological or archaeological importance;
iii) cause nuisance or materially significant disturbance to local residents as a consequence of the generation of dust, noise or vibration by site operations or associated transport;
iv) prejudice highway safety through the volume or nature of vehicle movements generated;
v) result in pollution of water resources or soils or the interruption of land drainage;
vi) cause materially significant permanent change to local rights of way networks; or
vii) result in permanent loss of best and most versatile agricultural land.

4.6.7 Applications to extract minerals should be accompanied by sufficient information to demonstrate that such unacceptable impacts would not result or could be controlled and to demonstrate the presence of the mineral. Whenever proposals, except those involving the extraction of energy minerals, would result in unavoidable adverse impacts on local amenity or the environment, they should be accompanied by information to demonstrate the need to extract the mineral as well as the absence of more suitable alternative sources of supply.

4.6.8 The above policy has formed the basis for the assessment of the alternative sites.

4.6.9 Johnsons Wellfield Quarries Ltd has undertaken a wide appraisal to identify potential new workable sites. The requirements of the company are

approximately 25 years of mineral reserves and these identified sites are areas of proven mineral that JWQ regards as worth pursuing.

4.6.10 In all cases, these sites have been identified because of the quality and extent of the mineral they contain. This is based on extensive and detailed site investigation work undertaken by the company over a considerable period of time.

4.6.11 JWQ had originally identified five possible areas within which it considered applications for extraction might be possible and appropriate within the life of the LDF. The five areas originally identified by JWQ with appropriate mineral and the potential for approval to extract are:

- Honley Wood
- Seventy Acres
- Airfield Extension – Now to be known as Whitehead Quarry
- Thewlis Lane
- Bolster Moor

Three new sites have now been added to the list and these are:

- Honey Wood
- Warwick Quarry
- High Riggs Quarry

4.6.12 Each of the sites has been extensively drilled and appraised and then assessed on suitability against a range of environmental criteria for its potential to cause impact.

4.6.13 The full alternative sites appraisal can be found in Appendix 13 of the Technical Appendices

5.0 EXISTING SITE DESCRIPTION

5.1 Site Location and Setting

5.1.1 The site is located to the east of Thewlis Lane, Crosland Moor which is approximately 3km to the west of Huddersfield town centre as shown on the location plan, Ref 10093/450. Grid Reference SE120 144.

5.1.2 The site is surrounded by residential properties to the north, east and south and to the former Wellfield Quarry to the west which serves the operational hub of the quarry complex and includes infrastructure such as saw sheds, plant workshops and associated buildings. Please refer to the existing site plan, Ref 10093/452.

5.1.3 Waterholes Quarry lies approximately 400m to the south west and is still operational for sandstone extraction and inert landfill and Crosland Moor Quarry lies a further 800m to the southwest and this is the main operational quarry for JWQ.

5.1.4 The site lies at an elevation of approximately 208m AOD to the west at Thewlis Lane and slopes gently at an approximate slope of 1:20 to the east towards Balmoral Avenue at 190m AOD. The landscape setting is discussed in more detail within the Environmental Statement but the site comprises pasture land with soils of Agricultural Land Classification grade 3a and 3b.

5.1.5 A detailed topographical survey has been undertaken of the site, Ref 10093/452. The site is open agricultural land subdivided into 6 rectangular fields by dilapidated drystone walls and interspersed by the occasional tree along the field boundaries. At the centre of the site lie the derelict remains of the Thewlis Lane Farm buildings, the farmhouse of which is designated a Grade II Listed Building. An application has been submitted to English Heritage to remove the Grade II listing of this building and this application is currently pending.

5.1.6 The closest residential properties are located on Sandene Avenue, Nairn Close and Ballater Avenue to the north, Balmoral Avenue to the east and Moorpark Avenue, Moor Close and Woodleigh Grove to the south.

5.1.7 A search conducted on the Environment Agency website has shown that the site does not lie within a flood plain. There are no watercourses in or around the vicinity of the site.

5.1.8 The geology beneath the site is comprises sandstones and grit forming part of the Millstone Grit series. The site is underlain by Rough Rock, which is identified as a minor aquifer by the Environment Agency. The site does not lie within a groundwater source protection zone.

5.2 Road Network

5.2.1 Thewlis Lane connects to Blackmoorfoot Road, which is a route emanating from Huddersfield in the east and extending in a south west direction (from

the A62 Manchester Road) through the south/west suburban areas of the city towards the rural settlements in the hills to the south west of the city.

5.2.2 Thewlis Lane is a two way road, subject to the national speed limit (60mph for private cars). Predominantly, it's function is that of access to adjacent farmland and (from Blackmoorfoot Road) the existing Johnsons Wellfield Quarry complex.

5.3 Public Rights of Way

5.3.1 The site is bounded to the south by definitive public footpath Huddersfield 220. The footpath does not cross any part of the site so no diversions will be necessary and the footpath will be retained in use for the duration of the operations.

5.3.2 There is a walled track which was the old access to the Thewlis Lane farmhouse which links Thewlis Lane to Balmoral Avenue but this is not classed as a definitive footpath

5.4 Services and Installations

5.4.1 The site is not crossed by services, (electricity, gas or water)

5.5 Agricultural Classification

5.5.1 Land of sub-grades 3a and 3b agricultural quality is present on the application site, with a small area of non-agricultural land.

6.0 EXPLORATION, GEOLOGY AND RESERVES

6.1 Introduction

6.1.1 A number of coreholes have been drilled in order to provide a detailed reserve assessment in the proposed extraction area.

6.1.2 Historically, Dimension stone has been extracted from the Rough Rock on Crosland Moor for over 150 years and Johnsons Wellfield Quarries have been operational on the site from 1928.

6.1.3 Crosland Hill Hard York Stone which is worked at Crosland Moor is from the Millstone Grit of Carboniferous age. The particular sandstone quarried at Crosland Moor is called Rough Rock, because it feels rough to the touch, as it is made of gritty sand grains. Crosland Hill sandstone appears to be a durable stone that is not affected by acid rain or air pollution. The stone has been described as 'clean, but not colourful, consistent and extremely durable. The compressive and flexural strength of the stone is towards the top of the range for UK sandstone.

6.1.4 The regional geology is outlined on BGS 1:50000 Sheet 77 Huddersfield (2003). Stratigraphically, the potential reserves lie within the uppermost part of the Millstone Grit Series (Yeadonian, Upper Carboniferous) within the Rough Rock sandstone group. In general, these measures comprise a variable thickness of sandstones and inter-bedded siltstones and mudstones. The sandstone units within this sequence vary in development from thin, often impersistent, flaggy horizons of poor quality stone to thicker, more massive beds suitable for recovery of sawblock (blockstone) and quarry products sandstone.

6.1.5 JWQ carried out several phases of drilling between July 2000 and February 2002, consisting of 9 fully cored boreholes, which were logged in detail by the driller to a pre-determined method as advised by JWQ. The boreholes were strategically located to provide all the necessary information on rock quality, thickness, extent and continuity throughout the potential reserve area.

6.2 Strata Sequence

6.2.1 The generalised vertical sequence (GVS) proved within the area of the site can be summarised as follows:-

Average Thickness (m)	Lithology	Remarks
0.33	Soil, clay	Superficial deposits
2.10	Weathered sandstone	
24.82	Sandstone.	**Target Sandstone unit**
7.65	Siltstone and silty or shaley sandstone and mudstone	Basal beds

6.3 Reserve Evaluation

6.3.1 The core drilling results show that the mineral deposit within the Rough Rock outcrop will enable the extraction of reserve to provide a mixture of prime block and what is termed 'quarry product' which is used primarily for flagstone and walling stone products.

6.3.2 The potential yield from the proposed quarry development equates to approximately 200,000 tonnes. This equates to approximately 25,000 tonnes per annum, providing a blockstone reserve life of approximately 8 years.

6.4 Economic Mineral Assessment

Sawblock Stone Quantities

6.4.1 The following estimate of sawblock includes all sandstone sections within the Rough Rock, with an unbroken core thickness greater than 0.60m.

6.4.2 The drilling data indicate a variable range of stone quality across the reserve area for the Rough Rock assessed as a potential sawblock source.

Quarry Products Sandstone

6.4.3 The following estimate of quarry product sandstone includes all sandstone sections within the Rough Rock with an unbroken core thickness between 0.30m and 0.60m. The area used in this estimate is not the basal quarry area but an area calculated from the distribution of the available economic sandstone.

6.4.4 The drilling data indicate a variable range of stone quality across the reserve area for the Rough Rock assessed as a potential quarry product sandstone source.

6.5 Summary

6.5.1 Estimated reserves of sandstone of a quality capable of producing sawblock and quarry products stone, based on the criteria provided by JWQ and outlined in the geological report, are estimated to be approximately 200,000 tonnes in total. Very minor quantities of potential sawblock and quarry products stone may additionally be recovered from horizons not identified in the core samples.

7.0 THE PROPOSALS

7.1 Quarry Operations

7.1.1 The Site is to be used for the extraction of some 200,600 tonnes of block stone (sandstone) which will be processed at the adjacent stone processing works to produce dimension stone and quarry product for paving and walling stone.

7.1.2 The proposed phased working and restoration of the site will take place in accordance with drawings 10093/455 to 10093/462. Other than soil stripping and removal of overburden, operations within each phase of working will take place below surface level. It is proposed to work the mineral using excavators, dump trucks and associated mechanized equipment. No blasting will be necessary at this site.

7.1.3 The sawing and screening of mineral will not take place within the proposed site. All mineral, once excavated will be transported out of the site and across Thewlis Lane to the Wellfield site for processing into various sandstone products.

7.1.4 Stone block from the proposed Thewlis Lane Site will be stored for seasoning in the stone storage areas as shown on the phasing plans. The stone will then be sawn and processed within the various buildings situated at the Wellfield Site. Dependant on the quality of the block, the sandstone will be processed into dimension stone, flagstone or walling stone products.

7.2 Access

7.2.1 A new Heavy Plant Crossing is proposed in Thewlis Lane to accommodate the traffic movements between the existing operations and the proposal site. The crossing would provide access for operational traffic only.

7.2.2 The proposed road crossing would incorporate appropriate strengthening of the existing highway pavement.

7.2.3 Further details can be found in section 8.6 of this Environmental Statement and on drawing, Ref 10093/467.

7.3 Excavation Design

7.3.1 The extraction area (limit of excavation at surface) is shown on the phasing plans 10093/455 to 462. The potential reserve area has been reduced by adopting a 100m stand off from occupied properties. The excavation to the base of the Rough Rock correlated within the proposed excavation area has been defined by stand offs and batters as follows:-

- A general 100 metre stand off from occupied properties.
- Construction of a 4m high screening mound.

7.3.2 Excavation depths vary from 20 metres (m) in the south west to 29m in the north west. The proposed excavation depths in the east are between 22 and 23m. The average depth of excavation is 24.9m.

7.4 Working Method

7.4.1 The site will be worked in accordance with the submitted phasing drawings which accompany this planning application.

7.4.2 To enable the proposed Thewlis Lane Site to be restored back to original ground levels and avoid potential differential settlement issues occurring on the land in future years, shale is to be excavated from the existing operational Airfield Quarry and stored in a 10 metre high storage mound prior to being backfilled and compacted in the open working void at Thewlis Lane. Overburden from the Thewlis extraction area will be used to backfill Airfield Quarry back to the approved restoration scheme under the existing planning permission.

7.4.3 The working of the mineral and accompanying reclamation will be undertaken progressively within the site.

7.4.4 The general phasing scheme is shown on the phasing plans, No's 10093/455 to 10093/462. Below is a description of what will take place in each of the phases of workings as shown on the submitted drawings.

Phase 1 – Drawing Ref 10093/455

i) Airfield Quarry blockstone extracted from cuts A1 to A3 and transported along the haul road to the external storage area.

ii) Shale inter-burden from Airfield Quarry cuts A1 to A3 placed in temporary storage above restoration profile.

iii) Overburden from Airfield Quarry cuts A1 to A3 is to be extracted and placed in the existing void from previously worked cuts.

Phase 2 – Drawing Ref 10093/456

i) Soils to be stripped from area T1 at the proposed Thewlis Lane Quarry and placed in a 3m high screening mound adjacent to Thewlis Lane. A 4m high screening mound with a 1 in 5 outer slope will be placed around the site perimeter. Thewlis Lane overburden extraction to commence from cut T1 and be transported to Airfield Quarry for backfill material in voids A1 to A3, and in temporary surcharge above restoration level to a maximum height of 10m above ground level.

ii) Extraction and Transport of block from Thewlis T1 along haul road to external stone storage area.

Phase 3 – Drawing Ref 10093/457

i) Overburden from Airfield Quarry cuts A4 and A5 to be extracted and placed in the existing void from previously worked cuts. Sandstone

block extraction to commence in Airfield Quarry cuts A4 and A5, and transported to the external stone storage area.

ii) Shale inter-burden to be extracted from Airfield Quarry cuts A4 and A5, and transported to Thewlis cut T1 and backfilled and compacted, or transported to temporary storage at Waterholes Quarry.

iii) Waterholes Quarry filled with shale from Airfield cut A5, until required for backfill of Thewlis Lane Quarry.

Phase 4 – Drawing Ref 10093/458

i) Thewlis blockstone extracted from cut T2 and transported along the haul road to the external storage area.

ii) Thewlis overburden from cut T2 transported along the haul road and discharged into Airfield Quarry voids A4 and A5, and temporary surcharge to be stored above ground level to a maximum height of 10m.

Phase 5 – Drawing Ref 10093/459

i) Airfield overburden extraction from cut A6 and discharged into previous Airfield cuts (quarry void) and temporary surcharge to maximum height of 10m above restoration profile.

ii) Shale inter-burden extracted from Airfield cut A6 and transported to Thewlis cut T2, and backfilled and compacted, or taken to Waterholes for temporary storage.

iii) Airfield block from cut A6 extracted and transported to external stone storage area.

iv) Airfield overburden extracted from cut A7 and backfilled into void A6.

v) Shale inter-burden extracted from Airfield cut A7 and transported to temporary storage at Waterholes.

vi) Airfield block extraction from cut A7 and transported to external stone storage area.

Phase 6 – Drawing Ref 10093/460

i) Thewlis overburden extracted from cut T3 and then loaded and transported along haul road and discharged at Airfield void A7.

ii) Thewlis block extracted from cut T3 then loaded and transported along haul road and delivered to external storage area.

Phase 7 – Drawing Ref 10093/461

i) Airfield overburden extracted from cut A8 and backfilled in airfield quarry void.

ii) Airfield shale inter-burden extracted from cut A8 and transported along haul road, and discharged and compacted at Thewlis void T3.

iii) Airfield overburden extracted from cut A9 and backfilled in airfield quarry void.

iv) Shale inter-burden from Airfield cut A9 extracted and transported to Thewlis cut T3 and deposited and compacted.

v) Block extraction from Airfield cuts A8/A9 and transportation to external stone storage area.

vi) Shale extracted from area S1 and transported to Thewlis cut T3 and deposited and compacted

vii) Soil in screening mounds at Thewlis to be spread over the quarry area to original ground levels.

Phase 8 – Drawing Ref 10093/462

i) Upon completion of mineral extraction at Airfield quarry, cuts A7/A8/A9 and S1 will be infilled with overburden from surcharge mound to original ground levels.

ii) Waterholes quarry to revert back to landfill use as permitted

7.5 Weighing

7.5.1 Where a weighbridge is required, all vehicles will cross Thewlis Lane and use the existing weighbridge at the main site entrance.

7.6 Wheel Cleaning

7.6.1 The company operate a wheel cleaning facility adjacent to the main quarries access point off Thewlis Lane. All plant seeking direct egress from the proposed workings would cross over Thewlis Lane and enter the main compound and utilise the wheel cleaner as required.

7.7 Plant and Equipment

7.7.1 A variety of different types of plant and equipment will be utilised on site for the following purposes:

- Soil stripping, storage and placement
- Overburden excavation and removal
- Mineral extraction and reclamation

Operations	Plant Description	No of Units
Soil removal and construction of baffle	360º Excavator	1

mounds	Bulldozer	1
Overburden Removal and backfill	Dump Trucks	3
	Bulldozer	1
	360º Excavator	1
Excavating and Loading Mineral	Dump Trucks	3
	360º Excavator	1
	Rock Splitter	1
Pumping	4 Inch Pumps	1

7.8 Hours of Operation

7.8.1 The proposed working hours for the quarry are:

Monday to Friday	0730 – 1800
Saturday	0730 – 1300

7.8.2 No operations shall take place on Sundays or Bank Holidays.

7.9 Blasting

7.9.1 It is not proposed to undertake the blasting of mineral within the application site. Minerals will be extracted using excavators and other mechanical plant as required.

8.0 ENVIRONMENTAL CONSIDERATIONS

8.1 Introduction

8.1.1 The technical reports for the following assessment work are contained within the Technical Appendices to the Environmental Statement.

8.1.2 The main findings and conclusions of these technical reports are summarised below. These findings demonstrate potentially the most significant environmental effects of the proposal.

8.1.3 The 'receptors' of environmental impacts arising from the mineral extraction are those elements of the environment that will be affected in some way by the development. For the purpose of the Environmental Assessment, these elements have been sub-divided into a combination of environmental elements and are as follows:-

Section 8.2 –	Ecology
Section 8.3 –	Landscape and Visual Impact
Section 8.4 -	Sols and Agricultural Land Classification
Section 8.5 –	Dust and Air Quality
Section 8.6 –	Noise
Section 8.7 -	Traffic
Section 8.8 –	Hydrogeology
Section 8.9 –	Flood Risk Assessment

8.2 ECOLOGY

Introduction

8.2.1 Silkstone Environmental Ltd commissioned Faulks, Perry, Culley, and Rech (FPCR) to carry out an Ecological Appraisal of the Thewlis Lane Site. Their methodology, findings and conclusions are included in "Thewlis Lane, Ecological Appraisal" which is attached as Appendix 1 of the Technical Appendices. A full survey of the site has been undertaken, in 2011 and the following is a summary of their findings.

8.2.2 The site is 11ha in size and consists of six fields of improved grassland, enclosed by dry stone walls. An old track crosses east-to-west through the centre of the site and end at the derelict remains of Thewlis Farm, now restricted to the foundations of the farm and associated buildings. Additional habitats present within the site are restricted to a small number of early mature tree standards and patches of tall ruderal herbs located along its eastern boundary and in association with the farm ruins. Small amounts of scattered scrub were also association with the former farm buildings.

Background

8.2.3 In order to compile existing baseline information, relevant ecological information was sought from both statutory and non-statutory organisations, for the purpose of this report these included;

- Multi Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk;
- West Yorkshire Ecology; and
- West Yorkshire Bat Group

8.2.4 The search area for biodiversity information was related to the significance of the site, species and potential zones of influence, as follows;

- 5km around the survey area for sites of International Importance (e.g. Special Areas of Conservation (SAC), Special Protection Area (SPA), Ramsar Site)
- 2km around the survey area for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSI))
- 1km around the survey area for sites of County or Local Importance (e.g. Sites of Importance for Nature Conservation (SINC), Local Wildlife Sites (LWS) or Local Nature Reserves (LNR)) and species records (e.g. Statutory Protected, United Kingdom Biodiversity Action Plan (UKBAP), Local Biodiversity Action Plan Species (LBAP) or notable species)

Flora/Habitats

8.2.5 The site was surveyed on the 24th of June 2011 using the standard Extended Phase I Habitat Survey methodology (JNCC, 2004), as recommended by Natural England to identify specific habitats of ecological interest. Whilst the species lists recorded should not be regarded as

exhaustive, sufficient information was gained during this survey to enable classification and assessment of major habitat types.

Fauna

8.2.6 During the survey of the site, observations, signs of or suitable habitat for any species protected under Part I of the Wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats & Species Regulations 2010 and the Protection of Badgers Act 1992. Consideration was also given to the existence and use of the site by other notable fauna such as UK BAP, LBAP or Red Data Book (RDB) species.

Desk Study

Statutory Designated Sites

8.2.7 No statutory designated sites of European, National or Local nature conservation importance are located within 5km, 2km or 1km of the site respectively.

Non-Statutory Designated Sites

8.2.8 No non-statutory designated sites occur within the site.

8.2.9 Two Kirklees Sites of Wildlife Significance (SWS) occur within 1km of the site. Delves Wood SWS and Dean Wood SWS are located 300m and 800m to the south of the site respectively. SWSs are sites of local or district-wide importance for the enjoyment, study or conservation of wildlife, geological features and landform. No further information was provided as part of the desk study exercise and West Yorkshire Ecology state that there is seldom detailed ecological information on record for them.

8.2.10 Both Delves Wood SWS and Dean Wood SWS are also identified as ancient & semi-natural woodlands, Daffy Wood located 780m to the south-west of the study site is also identified as ancient replanted woodland.

Protected / Notable Species

8.2.11 Relevant records provided by West Yorkshire Ecology pertaining to protected or otherwise notable taxa are listed in Table 1. Grid references and other precise locational information have been omitted due to the sensitive nature of records.

Table 1: Protected and notable species records

Species	Conservation status	Record Location / Suitable habitat within or near site?
Common pipistrelle *Pipistrellus pipistrellus*	UK BAP, WCA, CHSR	Field records approx. 30m north, 450m south-east & 780m east. Some limited foraging opportunities and no potential roosting sites on site.
Bat sp. *Chiroptera*	WCA, CHSR	Roost 700m south-east, field record 780m east & 800m south. Some limited foraging opportunities and

		no potential roosting sites on site.
Soprano pipistrelle *Pipistrellus pygmaeus*	UK BAP, WCA, CHSR	Roost 660m south-east. Some limited foraging opportunities and no potential roosting sites on site.
European water vole *Arvicola Amphibus*	UK BAP, WCA, CHSR LBAP	Approx. 700m east. No suitable habitat on site.
Badger *Meles meles*	PB	Sett approx. 450m west. Grassland provides suitable foraging habitat.
Slow-worm *Anguis fragilis*	WCA, UK BAP	Approx. 600m east. No suitable habitat.
Dunnock *Prunella modularis*	UK BAP	Approx. 600m east. Limited foraging and nesting opportunities.
Bullfinch *Pyrrhula pyrrhula*	UK BAP	Approx. 600m east. Limited foraging and nesting opportunities.
Song thrush *Turdus philomelos*	UK BAP, RED	Approx. 600m east. Limited foraging and nesting opportunities.
Ancistronycha abdominalis (Beetle)	Notable B	Dean Wood approx. 800m south. No suitable habitat on site – associated with open woodland or woodland edge
Anotylus mutator (Beetle)	Notable	Dean Wood approx. 800m south. No suitable habitat on site – associated with grassland, wetland, reservoirs and beaches.
Aphodius sordidus (Beetle)	Notable A	Approx. 350m north-west. No suitable habitat – associated with dry sandy or chalky areas, often near the coast.
Atheta aquatilis (Beetle)	Notable	Dean Wood approx. 800m south. No suitable habitat on site – associated with wetland and stream margins.
Carabus nitens (Beetle)	Notable B	Approx 350m north-west. No suitable habitat on site – associated with heathland and moorland.
Catops longulus (Beetle)	Notable	Dean Wood approx 800m south. No suitable habitat on site – associated with broad-leaved woodland, carrion and rabbit burrows
Corticaria inconspicua (Beetle)	Notable B	Approx. 380m north-west. Recorded from woodland, moorland, fens and dykes.
Malthodes guttifer (Beetle)	Notable B	Dean Wood approx 800m south. No suitable habitat on site – associated with Broad-leaved woodland and conifer plantations.
Mycetophagus piceus (Beetle)	Notable B	Dean Wood approx 800m south. No suitable habitat on site – associated with ancient broad-leaved woodland, pasture woodland and breckland.
Phyllodrepa puberula (Beetle)	Notable A	Approx. 380m north-west. No suitable habitat on site – associated with Wide variety of habitats ranging from woodland, coastal undercliffs and bird nests.
Phyllodrepodidea crenata (Beetle)	Notable B	Dean Wood approx. 800m south. No suitable habitat on site – associated with woodland.
Ptinus lichenum	RDB	Dean Wood approx. 800m south.

(Beetle)		No suitable habitat on site – associated with woodland.
Rhizophagus picipes (Beetle)	Notable A	Dean Wood approx. 800m south. No suitable habitat on site – associated with Woodland and pasture-woodland.
Limonia inusta (True Fly)	Notable A	Dean Wood approx. 800m south. No suitable habitat on site – associated with heathland & woodland

Conservation Status Key: CHSR – The Conservation of Habitats & Species Regulations 2010, WCA – Wildlife & Countryside Act, UK BAP – UK Biodiversity Action Plan, RED – Red List Bird of Conservation Concern, PB – Protection of Badger, LBAP – Kirklees Biodiversity Action Plan Species

Field Results – Habitats / Flora

Improved Grassland

8.2.12 Improved grassland dominates the site and was typically of restricted diversity. At the time of survey the sward was uncut with a height of approximately 1m. Perennial rye grass dominated the sward, with occasional rough meadow-grass *Poa trivialis* and creeping bent *Agrostis stolonifera* and locally frequent creeping soft-grass *Holcus mollis*. False oat-grass *Arrhenatherum elatius* and cock's-foot *Dactylis glomerata* were locally frequent in association with the field margins.

8.2.13 Of the herbs, white clover *Trifolium repens*, broad-leaved dock *Rumex obtusifolius*, creeping buttercup *Ranunculus repens*, common ragwort *Senecio jacobaea* and common sorrel *Rumex acetosa* occurred occasionally with patches of locally frequent sheep's-sorrel *R. acetosella*.

Photograph 1 – Improved grassland.

Semi-Improved Grassland

8.2.14 Semi-improved grassland occurs along the margins of the former farm track. Wavy hair-grass *Deschampsia flexuosa* and red fescue *Festuca rubra* formed the most frequent components to the sward with occasional creeping bent, cock's-foot, false oat-grass, Yorkshire-fog *Holcus lanatus* and creeping soft-grass also present. The diversity and frequency of herbs was low and limited to tall ruderal herbs such as creeping thistle *Cirsium arvense*, broad-leaved dock *Rumex obtusifolius* and rosebay willowherb *Chamerion angustifolium*; common forbs including common sorrel, sheep's-sorrel, red clover *Trifolium olonize*, lesser stitchwort *Stellaria graminea* and heath bedstraw *Galium saxatile*.

Photograph 2 – Semi-improved grassland along track.

Tall Herb (Ruderal)

8.2.15 Areas of tall ruderal herbs occurred in association with the farm ruins and as a linear strip along the site's north-eastern boundary. Common nettle *Urtica dioica* and rosebay willowherb predominated with locally abundant creeping thistle. Additional associates included occasional false oat-grass, broad-leaved dock, fox-and-cubs *Pilosella aurantiaca* and cock's-foot.

Scattered Scrub

8.2.16 Scattered scrub occurs in association with the ruins of Thewlis Lane Farm. Species present include Japanese spirea *Spiraea olonize*, grey willow *Salix cinerea* and dog-rose *Rosa canina*.

Tree Standards

8.2.17 The presence of trees within the site is restricted to a small number of early mature pedunculate oak *Quercus robur*, goat willow and rowan *Sorbus aucuparia* located in association with the field boundaries.

8.2.18 Early mature lime *Tilia cordata x T. platyphyllos*, pedunculate oak and silver birch *Betula pendula* form a tree line along part of the site's eastern boundary and three mature sycamore standards abut the northern site boundary.

Hedgerows

8.2.19 A single species-poor hedgerow occurs in association with the boundary of a residential property along part of the site's eastern boundary. The hedgerow is formed from Leyland cypress *x cuppressocyparis leylandii* and is of a rectangular structure measuring approximately 2m wide by 3m high. The hedgerow would be exempt from the Hedgerow Regulations 1997, owing to it forming the cartilage of a dwelling.

Field Results – Fauna

Badger

8.2.20 No evidence of badger activity was recorded in association with the site during the survey.

Bats

8.2.21 Trees located within the site were semi-mature to early-mature in nature and lacked features such as rot holes and cracks suitable for roosting bats.

8.2.22 Owing to the predominance of improved grassland and resulting lack of habitat diversity, particularly the absence of any internal hedgerows or tree-lines, the site is considered to be of limited value to bats for foraging and commuting.

Breeding Birds

8.2.23 The open grassland within the site has the potential to provide nesting habitat for ground nesting birds such as skylark, which was observed singing over the site during the survey (although the site did not typically provide ideal habitat for this species). The trees and areas of scattered scrub present also offer some nesting habitats for generalist bird species.

8.2.24 The overall value of the site to breeding birds is likely to be limited, owing to its relatively small size and the lack of structural and habitat diversity.

Great Crested Newts

8.2.25 No water bodies occurred within the bounds of the site. Three water bodies were identified within 500m of the site boundary. Two (Ponds 1 & 2) are located approximately 100m to the west of the site within an area of partially restored quarry and the third (Pond 3) is located approximately 90m to the north of the site, within an area of rough grassland.

8.2.26 The two water bodies located to the west of the site appeared to have been relatively recently created. Pond 1 is rectangular in shape being approximately 50m by 5m. At the time of survey water depth was approximately 0.3m. No submerged or floating-leaved aquatic vegetation was noted and the banks comprised largely bare earth with some scattered marginal herb and grass species, creeping bent *Agrostis stolonifera*, marsh-foxtail *Alopecurus geniculatus*, curled dock and *Rumex crispus* skullcap *Scutellaria galericulata*. Pond 2 (refer to Photograph 3) is approximately 10m in diameter and, at the time of survey, devoid of standing water, with only soft mud present. Associated vegetation was restricted to patches of great willowherb and grasses around the waterbody's margins. An associated warning sign, indicated deep slurry.

8.2.27 Pond 3 (refer to Photograph 4) located to the north of the site was almost dry at the time of survey with only small amounts of pooled water remaining. Vegetation present, included Canadian pondweed *Elodea Canadensis* and soft-rush *Juncus effuses* the extent of which would indicate the seasonal presence of a more substantial waterbody and the former of which could potentially provide suitable egg-laying suitable for newt species, should they be present. The waterbody was also found to support the highly invasive New Zealand pigmy weed *Crassula hemsii*. The species is listed under Schedule 9 of the Wildlife and Countryside Act 1981 and as such it an offence to plant or otherwise cause this species to grow in the wild.

Photograph 3: Pond 2 located approximately 100m west, within an area of partially restored quarry

Photograph 4: Pond 3 located approximately 90m north of the site

8.2.28 All three water bodies were considered to represent, sub-optimal habitat for great crested newt, as reflected in their low HSI scores (see Table 2 below).

Table 2. HSI assessment

Ref.	Location	Area	Pond Drying	Water Quality	Shade %	Fowl	Fish	No. Ponds	Terrestrial Habitat	Macrophytes %	HSI
P1	**A**	250m²	**Sometimes**	**Poor**	**0**	**Absent**	**Absent**	**2**	**Mod**	**0**	**0.41**
-	**1**	**0.4**	**0.5**	**0.33**	**1**	**1**	**1**	**0.01**	**0.67**	**0.3**	**-**
P2	**A**	100m²	**Annual**	**Poor**	**0**	**Absent**	**Absent**	**2**	**Mod**	**0**	**0.33**
-	**1**	**0.2**	**0.1**	**0.33**	**1**	**1**	**1**	**0.01**	**0.67**	**0.3**	**-**
P3	**A**	**2500** m²	**Annual**	**Poor**	**0**	**Absent**	**Absent**	**2**	**Good**	**10**	**0.40**
-	**1**	**0.8**	**0.1**	**0.33**	**1**	**1**	**1**	**0.01**	**1**	**0.4**	**-**

Reptiles

8.2.29 The majority of the site is considered unsuitable habitat for reptiles, due to its homogenous nature. However, some limited potential reptile habitat is present along the central track, dry stone walls and associated margins (especially where sections of wall had collapsed) and within the ruined farm, where rubble piles where present. Further, optimal habitat for reptiles is present in the heathland which lies adjacent to the site's southern boundary.

Invertebrates

8.2.30 Due to the predominance of improved grassland, largely devoid of flowering herbs, and general lack of habitat or structural diversity, the site is considered to be of negligible value for invertebrates.

Discussion and Recommendations

Designated Sites

8.2.31 No statutory designated sites are located within the site or in close proximity to its boundaries.

8.2.32 Two non-statutory designated sites are located within 1km of the site. Delves Wood SWS and Dean Wood SWS are located 300m and 800m to the south of the site respectively. Both are considered to be a sufficient distance from the site to prevent significant impacts arising as a result of dust or alteration in underlying hydrology.

Habitats

8.2.33 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:

- Inclusion within specific policy (e.g. veteran trees, ancient woodland and linear habitats in PPS9),
- Identification as a habitat of principal importance for biodiversity under NERC Act and consequently identification as a Priority Habitat within the UK or local BAP.

8.2.34 Improved grassland predominates within the site and is of limited diversity being dominated by a small number of common and widespread grass species. Improved grassland is a common habitat within Great Britain and is of negligible intrinsic conservation nature value.

8.2.35 The presence of sheep's sorrel and creeping soft-grass within the sward are indicative of acid ground conditions, common to the upland location of the site, but are not of sufficient cover or accompanied by other indicator species to suggest that the grassland is of any nature conservation merit.

8.2.36 Owing to their limited extent and/or composition of common and widespread species, remaining habitats within the site are considered to be negligible intrinsic nature conservation value.

Fauna

8.2.37 Principal pieces of legislation protecting wild species are Part 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats Regulations 2010. Some species, for example badgers, also have their own protective legislation (Protection of Badgers Act 1992). The impact that this legislation has on the planning system is outlined in ODPM 06/2005 Government Circular: Biodiversity and Geological Conservation – Statutory obligations and their impact within the Planning System.

8.2.38 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals, is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions for example.

Badgers

8.2.39 During the survey, no evidence of badgers was recorded in association with the site and subsequently no statutory constraints exist in relation to the species.

Bats

8.2.40 No habitats suitable to support roosting bats were identified within the site. Given the predominance of improved grassland and resulting lack of habitat diversity, particularly the absence of any internal hedgerows or tree-lines, the site is considered to be of limited value to bats for foraging and commuting.

Breeding Birds

8.2.41 Owing to the predominance of improved grassland and resulting lack of habitat or structural diversity, the site is considered to be of low value for breeding birds. Proposals may potentially result in the loss of breeding habitat for a small number of species, such as skylark and UK BAP

8.2.42 Priority Species, however, owing to the wide availability of suitable habitat within the local area; it is unlikely that the conservation status of any species would be affected.

8.2.43 The small amounts of scattered scrub and trees present offer suitable nesting habitat to small number of generalist bird species, which could be affected during initial site clearance works.

8.2.44 All birds are protected whilst on the nest. Any vegetation should therefore be removed outside of the bird breeding season (March to Aug/Sept) if this is not possible, vegetation should be checked prior to removal by an experienced ecologist. If active nests are found vegetation should be left untouched until all birds have fledged. Specific advice should be sought prior to undertaking the clearance.

8.2.45 Three waterbodies were identified within 500m of the site, located approximately 100m west and 90m north of the site. All three were found to have been relatively recently created following quarrying reinstatement and were found to offer poor suitability for great crested newts, as evidenced by their low habitat suitability index score. Furthermore no records of great crested newts were provided for the local area.

8.2.46 Given the relatively recent nature of the waterbodies, their low suitability, absence of records of the species from the local area and absence of any additional waterbodies within 500m of the three ponds from where potential populations may have colonised, the potential presence of the species is considered reasonably unlikely.

Reptiles

8.2.47 The majority of the site is considered unsuitable for reptiles, due to its homogenous nature.

8.2.48 However, some limited potential reptile habitat is present along the central track, dry stone walls and associated margins and optimal habitat is present in the form of heathland adjacent to the northern boundary.

8.2.49 All common reptile species, including slowworm, common lizard, grass snake and adder, are partially protected under the Wildlife and Countryside Act 1981 (as amended) in that it is an offence to intentionally kill or injure the species. In order to ensure that none of the above offences are committed it is recommended that specific reptile surveys are undertaken. Surveys can be undertaken from March to October, during suitable weather conditions.

8.2.50 Should the presence of the species be confirmed within the site, mitigation will be required in the form displacement or trapping and translocation to a suitable off-receptor site. The level of protection afforded to these animals does not require a licence to be in place prior to translocation; however agreement with the county ecologist and Natural England may need to be undertaken in regards to displacement of the species or the positioning of a potential off-site receptor site.

Further Surveys

Reptile Survey – June 2012

8.2.51 Although the Extended Phase I and Preliminary Protected Species Survey conducted in June 2011 found no direct evidence of reptiles within the majority of site, some limited potential reptile habitat was considered present along the central track, dry stone walls and associated margins (especially where sections of wall had collapsed) and within the ruined farm, where rubble piles where present.

8.2.52 Seven surveys were undertaken between 13/04/12 and 28/05/12 and no evidence of reptiles were observed, therefore it was concluded that the species is not considered to present a constraint to development.

8.2.53 The full report is included in Appendix 11 of the Technical Appendices.

Great Crested Newts – September 2012

8.2.54 The initial assessment of the ponds in close proximity to the site, which included a Habitat Suitability Index (HSI) assessment, indicated that they were unsuitable for supporting a population of Great Crested Newts (GCN) given their poor HSI scores, a lack of GCN records for the local area and their relatively recent and transient nature. Pond 3 was completely dry during the initial extended phase I habitat survey completed on 24 June 2011 (FPCR 2011).

8.2.55 However during completion of further surveys in the spring of 2012 it was noted that pond 3 had filled with water and that this may now provide potentially suitable habitat for GCN and therefore a presence /absence survey for this protected species was recommended.

8.2.56 The GCN presence/absence surveys were completed by RDF Conservation Ltd in suitable conditions during the main survey season and whilst not in strict conformity with the prescribed methods in GCN Mitigation Guidelines the number of survey visits completed, the variety of survey methods utilized and the level of survey effort undertaken are highly likely to have recorded GCN if this species were present in Pond 3. No GCN were recorded during any of the survey visits and the lack of records is considered to be substantive evidence that this species is not present in Pond 3, especially when viewed in association with the desktop study which did not identify any populations of GCN within 1km of Pond 3.

8.2.57 However, Smooth Newt *(Lissotriton vulgaris)* and Palmate Newt *(Lissotriton helveticus)* were recorded along with a small number of Common Frog *(Rana temporaria)*. The presence of adult Smooth and Palmate newts in Pond 3 during all of the survey visits further supports the assessment that GCN are not present in pond 3 because adults of this species would almost certainly be present in the pond at the same time if this species were present in the study area.

8.2.58 Furthermore during the hand netting visits in late August and early September a large number of Smooth/Palmate newt larvae[3] were recorded which indicates that Smooth and/or Palmate Newts had successfully bred in

pond 3 during the spring and summer of 2012. If GCN were present it is highly likely that this species would have also bred given the suitable conditions in Pond 3 and therefore it would be expected that GCN larvae would have been recorded along with Smooth/Palmate Newt larvae during hand searches in August and September 2012.

8.2.59 In conclusion, it is assessed that Pond 3 does not support a population of GCN and that this species is not a constraint to the proposed quarry extension development.

8.2.60 The full GCN survey can be found in Appendix 12 of the Technical Appendices.

8.3 LANDSCAPE AND VISUAL IMPACT

Introduction

8.3.1 An appraisal of the existing landscape character has been made followed by an assessment of the impact that mineral extraction will have on the landscape character and visual amenity of the area, both following completion and restoration of the site, and for the duration of the works and where appropriate, recommend mitigation measures.

8.3.2 The following sections are a summary of the full report which is contained in Appendix 2 of the Technical Appendices.

8.3.3 The desk study and accompanying field survey was undertaken in August 2012.

Potential Landscape/Visual Effects of the Proposed Development

8.3.4 For the purposes of the landscape and visual assessment the proposed development may be described as:

- A temporary, medium term of 8 years change in land use from agricultural land to a quarry.
- Soil stripping and earth movements and construction of screening bunds during an initial construction phase for a short term period of up to 8 weeks.
- Ongoing removal of mineral/stone and activity associated with it.
- Permanent creation of a new landform, albeit similar to the one which currently exists and the associated proposed planting and other restoration elements shown on the restoration scheme
- Overburden storage of shale from Crosland Moor Quarry (locally known as Airfield Quarry) to a height of 10m for a period of 8 years until required to be backfill compacted at Thewlis Lane Quarry.

LANDSCAPE IMPACT

Assessment of Landscape Quality

8.3.5 The assessment of landscape quality within the study area has been undertaken on the basis of the overall condition and aesthetic appeal, relative to the following landscape setting five-point scale as follows:

- ***Very High***: Areas and/or features which that have a particularly high value, by nature of their condition, high scenic qualities, strong characteristics (such as pattern and land cover), cultural associations, and/or relative position and amenity, including level of tranquillity. These are likely to be, but not necessarily, within a National Park, Area of Outstanding Natural Beauty, Registered Park and Garden or within a World Heritage Site;
- ***High***: Areas and/or features that that are considered to be of high value by virtue of their positive characteristics, sense of place or local or cultural associations. These areas will be of regional or local importance and are likely to be, but not necessarily, designated by the planning authority as being of landscape value;
- ***Moderate***: Landscapes and/or features which that retain a positive character and a sense of place and/or are of local interest or have local cultural associations. These areas are unlikely to be designated for their landscape value;
- ***Low***: Landscapes in fair to poor condition which that have undergone change to the extent that they no longer have a distinctive local character, or particular aesthetic quality, or they lack cultural associations;
- ***Very Low***: Degraded landscapes and/or features in poor condition whose distinctive character and aesthetic quality has been seriously damaged.

8.3.6 The application area and its surroundings is considered to be of ***moderate*** landscape quality for the following reasons:

- Detracting features, such as the quarries and the processing works are present and influence the perception of landscape quality particularly within the ZVI of the proposed development which defines the extent of the study area.
- The residential areas adjacent to the proposed Thewlis Lane site
- The landscape has no designations reflecting perception of quality.

8.3.7 The significance of the proposal on the landscape would be assessed as ***moderate adverse*** in the short term due to the effects on the current land being open agricultural use but would be ***minor beneficial*** on completion of the restoration scheme.

Summary of Landscape Appraisal

8.3.8 The appraisal of the baseline landscape of the proposed development identifies that it:

i) Lies within the Green Belt
ii) The Thewlis Lane application site is agricultural land, with no specific features of landscape or ecological interest.
iii) The site was the location of the former Thewlis Lane Farm, the last remnants of the farm are still remaining and the drystone walls on the site are in disrepair which is a detracting feature to the landscape value.
iv) The close proximity of the JWQ stone processing works and working quarries of Airfield and Waterholes are a strong detracting influence on the landscape character of the study area.
v) The wider landscape to the south of Airfield Quarry which will be affected by the proposed overburden storage mound has very open views from a wide area. The landscape is described as a unified pattern of small to medium sized fields, on rolling topography, which are bounded by a strong framework of drystone walls.
vi) The open workings at Airfield Quarry are visible from a wide area to the south and this is a detracting feature of the landscape value of the area.

Assessment of Landscape Effects

Thewlis Lane

8.3.9 The key points to consider in terms of landscape effects are:

- No significant characteristic landscape elements will be lost
- The restoration proposals would increase tree cover in the landscape and reinstate existing dilapidated stonewall boundaries with new fences and mixed species hedgerows. This will have a beneficial effect on landscape character.

8.3.10 The site does not contain any sensitive land cover elements and consists only of agricultural fields with dilapidated drystone walls and a few trees. These elements are not sensitive in the context of the surrounding landscape and are ready replicable and there is much scope for potential improvements from a landscape and ecological perspective.

8.3.11 The landscape value of the Thewlis Lane site is assessed as being of a ***medium*** value due to the detracting effects of the existing quarries and associated infrastructure.. The landscape quality of the site is assessed as ***moderate***. The landscape sensitivity is ***Low.***

8.3.12 The extraction operations at the proposed Thewlis Lane site will result in the loss of the fields and a few early mature oak which run down the centre of the site. The site will be progressively restored back to original ground levels to minimise the impact on the landscape character,

8.3.13 Overall the impacts on landscape character are considered to be of ***low*** magnitude equating to minor but noticeable changes over a localised area or moderate temporary changes over a short timescale.

Overburden storage area adjacent to Airfield Quarry

8.3.14 The overburden mound is to be located in an area previously worked for mineral extraction. The landscape in this area is already degraded by the existing quarry. It is acknowledged that this will be an unnatural feature of the landscape but it will not be a permanent feature so will therefore not affect long term landscape character and amenity. The overburden mound will be hydroseeded to grass at the earliest opportunity to enable it to blend in with the surrounding landscape.

Significance of Landscape Effects

8.3.15 The significance of the proposed development on landscape character has been assessed by comparison of the sensitivity of the landscape with the magnitude of the predicted landscape effects at three points in time.

8.3.16 The significance of landscape impacts may be summarised as:

- Initial Earthworks for soil stripping and creation of perimeter screening bund will have a ***minor adverse*** effect for a very short term of up to 8 weeks.
- Operational mineral extraction over and backfill compaction over 8 years will have a ***moderate adverse*** impact on the land for a temporary duration.
- Post restoration the scheme will be ***minor beneficial*** with the improvements made to the existing land quality, field boundary reinstatement and tree and mixed species hedgerows to be planted.

8.3.17 The extraction operations will result in the loss of the fields and hedgerows within the site boundary, with peripheral features along the boundary of the site retained and improved. The landscape elements to be lost during operations will be progressively restored such that they are lost in a series of short-term phases over the 8 year duration.

8.3.18 The quarry complex itself is not positively contributing to characteristics of the surrounding area, although mineral extraction operations have taken place within the landscape of this region for many decades, so in that respect the existing quarry contributes in part to the overall character of the area.

8.3.19 The study area is assessed through professional judgment, as being of ***Low*** sensitivity. Similarly most of the landscape of the study area is considered to be of ***Low*** quality, associated with industrial use and with detracting features such as the quarries and industrial and residential nature of the area.

VISUAL IMPACT

Potential Visual Effects of the Development

8.3.20 Changes in views may give rise to adverse or beneficial visual effects through obstruction in views, alteration of the components of the view and through the opening up of new views by the removal of screening. Potential visual effects arising from the development, excluding mitigation, may include:

- Short term visual impact during the initial earthmoving and construction period arising from the use of machinery and stripping of vegetation and soils.
- Short term visual intrusion and obstruction arising from the erection of perimeter screening bunds in the height range 3 to 4m.
- Visual intrusion from ongoing extraction.
- Visual intrusion from vehicles entering and leaving the site.
- Visual effects of the 10m high overburden storage mound adjacent to the existing operational Airfield Quarry.

Residual Visual Effects and Significance

8.3.21 A visibility study was carried out during August 2012 to determine the relationship of the site with its surroundings and the visibility of the site within the wider landscape and commenced with a desktop identification of areas of land which potentially there could be views of the site. An assessment of the visibility of the site as existing from properties, roads and public rights of way are detailed further in this report These included elevated areas of land some 3 kilometres to the east at Castle Hill Fort.

8.3.22 The desk study was followed by a visit to the site and surrounding area to check the extent of the visual envelope of the site and to determine the most exposed and contained parts of the site in visual terms.

8.3.23 A Zone of Visual Influence was determined in the desk study which identifies the key views towards and into the proposed site from properties, roads and public rights of way within the surrounding landscape. The ZVI of the proposed site is the area from where the site is visible using surrounding contoured data which is run through LSS Software.

8.3.24 The visual envelope or ZVI of any site is the area of land from which part or all of it is visible. The visual envelope is largely determined by landform or topography as areas of elevated land which may block or curtail views towards the site. Please refer to plan 10093/501 for reference.

8.3.25 For the purposes of the assessment of the visual effects of the development, the extraction of the mineral and accompanying restoration would be undertaken progressively in a clockwise direction in three phases over an 8 year period. The first phase will take approximately 3 years to fully extract and restoration will commence with shale backfilled and compacted back to original ground levels. Please refer to the working

phasing drawings 10093/455 to 462 submitted with the ES for further information.

8.3.26 The shale overburden material from the working of Airfield Quarry will be stored adjacent to the workings on previously worked and restored land in a storage mound up to 10m in height. This material will remain in-situ until it is required for the restoration of Thewlis Lane Quarry where it will be backfill compacted to create the original ground profile and levels. There is currently planning permission in place for an overburden mound of 5m in height, but we are proposing to increase the height to a maximum of 10m as part of the planning application. The 10m height has been calculated as necessary for the storage of restoration material for the duration of the scheme.

8.3.27 The assessment considers the visual impact of the mineral extraction area at the proposed Thewlis Lane Quarry and also the 10m high overburden storage mound at Airfield Quarry. The impact of these will be assessed separately to avoid confusion as they are over 1.3km apart.

Visual Appraisal of the proposed Thewlis Lane Quarry

8.3.28 Existing views into the site can be seen from the site appraisal photographs included in the full report in Appendix 2 of the Technical Appendices. The photographs show the open views available over the land at close proximity from all the surrounding site boundaries and from Thewlis Lane. These photographs show the site from a number of locations in close proximity to the site, particularly from Thewlis Lane, footpath 220 and the rear boundaries of the surrounding houses on Sandene Avenue, Balmoral Avenue and Moor Park Avenue. Only publicly accessible viewpoints were used for this appraisal.

8.3.29 Because of the existing topography, the residential properties, areas of woodland and the JWQ works adjacent to the site, the workings at the proposed Thewlis Lane Quarry will not be visible from any middle or long distance viewpoints. Only the close proximity viewpoints identified will need to be considered and the proposed mitigation measures in the form of the perimeter screening bunds will be effective such that they will screen the workings from the surrounding properties, users of the public footpath and road users and pedestrians on Thewlis Lane.

8.3.30 The most highly visible aspect of the operations at the proposed Thewlis Lane Quarry will be the initial soil stripping works and creation of the perimeter screening bunds but this is a very short term activity which will take place over a maximum 8 week period. Once the screening bunds are in place, no views of the extractive operations will be visible from any of the close proximity viewpoints. The only element which would be visible would be the vehicles leaving the site with mineral which would be seen when crossing Thewlis Lane towards the mineral storage yard at the existing JWQ works.

8.3.31 No views will be accessible into the workings from Thewlis Lane by road users or pedestrians due to the 3m high screening bund which will be positioned along the site boundary to the west.

8.3.32 Public Footpath 220 runs along the southern edge of the proposed site which does offer some glimpsed views into the site at certain points along the footpath. The proposed site is at a slightly elevated level to the footpath so the proposed bund will be effective in screening all possible views into the workings from footpath 220.

8.3.33 There are potential long distance views towards the site from areas of more elevated land, such as Castle Hill and Hall Bower which are approximately 3.0 kilometres to the east of the site. However, it is considered that the site is almost imperceptible from these distant viewpoints and it is only with the aid of binoculars that the site would be clearly visible.

8.3.34 The main consideration when discussing the visual impact of the proposed Thewlis Lane Quarry will not be the visual intrusion of the quarry workings but will be the loss of the open view across the agricultural fields from the properties surrounding the site and the users of Thewlis Lane and Footpath 220. For this impact the significance of visual effects is assessed as ***moderate*** due to the temporary nature of the scheme. The screening measures in place will be effective in that they will screen the views of the workings from the sensitive viewpoints but the open view which currently exists over the land will be replaced by a view of a 4m high screening mound, albeit will be gently graded with a 1 in 5 slope and seeded to grass but will block the open views currently available over the land. The land will be progressively restored back to a profile very similar to what exists at present so overall on balance over an 8 year period are assessed as ***moderate*** impact.

8.3.35 Particularly around the proposed Thewlis Lane Quarry, some views may be available from first floor windows but as stated in Guidance for Landscape and Visual Impact Assessment states:

'when considering views from windows, views from rooms normally occupied during waking/daylight hours are generally deemed more important than those used for sleeping, from which occasional views may be obtained'

Near Distance Views

8.3.36 Near distance views of the proposed site are obtained from Thewlis Lane and Footpath 220 which flank the site to the west and south. Further views have been obtained from the rear boundaries of the surrounding properties located on Sandene Avenue, Nairn Close and Ballater Avenue to the north, Balmoral Avenue to the east and Moorpark Avenue, Moor Close and Woodleigh Grove to the south.

Middle Distance Views

8.3.37 Middle distance views towards the proposed site are limited or non-existant due to the topographical variation and existing vegetation within the landscape to the south (and south west) and residential properties to the north and west. JWQ quarry operations are located to the west of the proposed site and they restrict any view, both middle and long distance view anywhere from a westerly direction.

Long Distance Views

8.3.38 Long distance views towards the site can be obtained from a limited number of publicly accessible locations towards Castle Hill Fort to the east approximately 3 kilometres away. Without the aid of binoculars, it is very difficult to visualise the existing quarries and workings so therefore judgement has been made that no consideration can be made for the impact from this particular vantage point.

Visual Appraisal of the Proposed Overburden Storage Area

8.3.39 The overburden storage area is proposed to be adjacent to the existing Airfield Quarry workings and as such the visual impact of the site already exists. The operations are already planning permitted for an overburden storage mound up to a maximum height of 5m but in our proposals for the working of Thewlis Lane Quarry requires an overburden storage mound up to a height of 10m.

Near Distance Views

8.3.40 Near distance views of the proposed overburden storage area are obtained from the roads and public footpaths in close proximity of the site. The landscape is very open to the south of the site and a number of views towards the current workings can be clearly seen from the roads and public footpaths. The nearest residential property to Airfield Quarry is from Hadden Farm to the south which is at a slightly lower elevation but does have views towards the site and the overburden mound will be visible from this property.

8.3.41 Other properties in close proximity are Walker Syke and Moor End Farm for which views towards the site are curtailed by the buildings at Hadden Farm and topographical variations.

Middle Distance Views

8.3.42 A number of middle distance views have been assessed from viewpoints 13 to 19 from Nopper Road and the public footpaths in the vicinity. The sensitivity of these views overall is assessed as medium. The views extend a rural panoramic landscape with some scenic quality and a few detracting features. The landscape is rural but it has not been designated for its rural quality. The existing quarry workings are visible from particular viewpoints to the south and west and this is certainly a detracting feature on the landscape.

8.3.43 Although the proposed overburden storage mound will be clearly visible from these locations and surrounding areas as the landscape is very open in this area, it will have one positive benefit in that it will completely screen the views of the open workings in this area. The overburden mound will be hydroseeded to grass at the earliest opportunity to minimise the visual impact therefore it is our opinion that this will have some beneficial impact from these viewpoints. The overburden mound will be in-situ for a temporary period of up to 8 years and will be removed when required for the restoration of Thewlis Lane Quarry. By the end of Year 8, the land will be fully restored back in accordance with the approved restoration scheme in

the existing planning permission and will then be fully integrated back into the original landscape.

Long Distance Views

8.3.44 Long distance views are available to the south from a number of locations but will really only be perceptible with the use of binoculars. Some views south of Whitehead Lane up to a distance of 1.5km. Longer distant views will be possible from over 3km to the south east at Henley Moor and over 2km to the east at Berry Brow. Castle Hill Fort is the prominent feature on the landscape to the east but as previously stated, the existing quarry workings are barely perceptible from this vantage point without the aid of binoculars.

Mitigation Measures

8.3.45 The purpose of mitigation is to avoid, reduce and where possible remedy or offset, significant negative impacts on the environment arising from the proposed development. The proposed mitigation measures can be split into short term, medium term and long term measures. These are detailed as follows.

8.3.46 Mitigation of potential landscape and visual effects of the proposed development have been incorporated into the planning application in the form of:

- The construction of a gently graded screening bund of 4m in height with a 1 in 5 slope around the perimeter of the extraction area
- A 3m high screening bund positioned adjacent to Thewlis Lane
- Advanced tree planting
- Progressive restoration

8.3.47 The mitigation proposals are designed to minimise the effect of the proposed development on the landscape and visual context of the site, the degree to which they are effective and the extent of the residual landscape and visual impacts taking mitigation into account is considered in the following paragraphs.

Short Term Mitigation

8.3.48 The principle short term mitigation measure requires the creation of the screening bunds around the perimeter of the site. These bunds have been designed to provide visual screening of the proposed development from Thewlis Lane and all the surrounding properties to the site.

8.3.49 The 3m bund positioned adjacent to Thewlis Lane will be effective in screening views from road users and pedestrians. A 4m screening mound has been proposed around the perimeter of the workings which will be gently graded with a 1 in 5 slope which has been designed to be effective in screening the workings from the surrounding properties and also is gently graded so the screening bund itself does not create a visual impact.

Medium Term Mitigation

8.3.50 Advance landscape planting is proposed as illustrated on the proposed restoration plan will be planted in the first available season in advance of the commencement of excavations.

8.3.51 This will take a number of years to grow and develop sufficiently to provide landscape and ecological benefits for the site.

Long Term Mitigation

8.3.52 The primary long term mitigation measures are those associated with the restoration of the quarry, which will be progressive and restore the land back to a similar profile that exists currently but with boundary reinstatement with mixed species hedgerows to replace the current dilapidated drystone walls and large areas of tree planting. Areas of tree planting will provide long term landscape benefits for the siite.

Conclusions

8.3.53 The baseline landscape and visual context of the application site has been described in relation to a desktop study of published information alongside a site survey in accordance with guidance on landscape and visual assessment.

8.3.54 Potential landscape and visual impacts, both adverse and beneficial of the proposed development have been identified taking mitigation into account to reduce or eliminate adverse effects.

8.3.55 The residual impacts of the proposed development taking mitigation into account have been described for a series of representative viewpoints, chosen to illustrate the range of viewpoints within the zone of visual influence of both the proposed Thewlis Lane site and the overburden storage area adjacent to Airfield Quarry.

8.3.56 It is accepted that any development of the scale proposed would result in some visual impact on the surrounding landscape and properties. However, the total number of properties that could experience high or adverse impact are the ones which are in close proximity to the site as previously discussed and the mitigation measures in the form of the perimeter screening bunds will be effective in screening the workings from the sensitive properties.. The negative aspect of the proposal would be a loss of an open view from these close proximity views for a temporary period of 8 years and therefore this impact is assessed as ***moderate*** overall.

8.3.57 The landscape character assessment concludes that the landscape of the proposed development area is of ***low*** sensitivity to change mainly due to the detracting effect of the previous and existing quarries and associated infrastructure in the area.

8.3.58 The significance of the proposal on the landscape would be assessed as ***moderate adverse*** in the short term due to the effects on the current land being open agricultural use but would be ***minor beneficial*** on completion of the restoration scheme.

8.3.59 The assessment of the visual effects of the proposal demonstrates that views of the Thewlis Lane development would be obtained from a number of locations surrounding the site but because of the existing topography, the residential properties, areas of woodland and the JWQ works adjacent to the site, the proposed works at Thewlis Lane will not be visible from any middle or long distance viewpoints.

8.3.60 Some of the long distance views that would be affected by the proposals are currently influenced by the existing built up area of Huddersfield and the existing quarries and workings adjacent to the site which are evident in views from elevated areas of land some 3km to the east of the site at Castle Hill Fort. These views are only perceptible with the aid of binoculars so are not considered to be relevant for consideration in this assessment.

8.3.61 The visual appraisal of the proposed Thewlis Lane Quarry demonstrates that the general site will be visible from surrounding properties but not on a ground floor level as the screening mound will act as an effective visual barrier to block views into the workings. Some views will be available from first floor windows but as stated in Guidance for Landscape and Visual Impact Assessment states:

'when considering views from windows, views from rooms normally occupied during waking/daylight hours are generally deemed more important than those used for sleeping, from which occasional views may be obtained'

8.3.62 The phased operation of the site and progressive restoration has been devised to help minimise land-take for quarrying/infilling activity. Screening mounds have an instant screening effect, but their height generally needs to be limited to prevent these features from creating adverse visual impacts in their own right. Woodlands take time to become effective and can screen views from higher viewpoints, but can limit desirable long-range views once the trees grow beyond the necessary height. The cross sections as shown on plan 10093/503 demonstrate the effectiveness of the proposed perimeter screening bunds in screening the workings but also show that the 1 in 5 slope proposed around the perimeter will gently grade into the existing landscape to lessen the visual impact.

8.3.63 The significance of the visual effects of the proposed Thewlis Lane site can be assessed as ***moderate*** for the residents in close proximity to the site as it will have an impact over the open view of the fields which are currently available but there will be no view of the workings itself and the temporary loss of this view over an 8 year period has also been considered when making this assessment.

8.3.64 For users of the public right of way 220 and the road users and pedestrians on Thewlis Lane, the magnitude is assessed as ***negligible***. Medium and long distance views into the site are not available and will be even less so when the screening measures are put into place so these are assessed as of ***very small*** magnitude and of ***negligible*** significance.

8.3.65 The overburden storage mound will be visible from a number of near middle and long distance views due to the openness of the landscape to the south

of the site. Viewpoints are possible of the current extraction area at Airfield Quarry from road users and users of the Public Right Of Way network.

8.3.66 Because there are already existing views of the quarry workings we could argue that the visual detraction already exists. The proposed overburden mound will in effect screen the existing workings and once it has been grass seeded to minimise the visual impact and blend in with the surroundings this will have a neutral impact on what is visible at present. Therefore we consider the magnitude of the visual effects of the overburden storage mound as ***medium*** with the significance assessed as ***moderate***.

8.3.67 In conclusion, the overall impact of the proposed Thewlis Lane Quarry on the landscape and visual amenity is considered to be not significant, principally because of the temporary nature of 8 years duration of the extraction operations, the incorporated mitigation measures and the well designed restoration proposals.

8.4 SOILS AND AGRICULTURAL LAND CLASSIFICATION

Introduction

8.4.1 Silkstone Environmental commissioned Land Research Associates to undertake an Agricultural Land assessment on the proposed Thewlis Lane site. Below is a summary of the full report which is contained in Appendix 3 of the Technical Appendices.

8.4.2 The site comprises of 7 ha within an 11 ha unit of agricultural grassland fields farmed by a tenant farmer and subject to an Entry Level Environmental Stewardship scheme that started on 01/04/2008. A silage crop was being taken off the land at the time of the survey.

Soils

8.4.3 The Defra Soil Strategy points out that soils deliver a range of vital functions for human activities including food and fibre production support for ecosystems and habitats, and environmental services that play a vital role in the global carbon cycle, stabilising and degrading contaminants and providing clean water. One of the strategy's objectives is to ensure that soil functions (soil ecosystem services) are fully valued in the planning process.

8.4.4 A detailed soil resource and agricultural quality survey was carried out in June 2012. It was based on observations at the intersections and mid-points of a 100 m grid, giving a sampling density of two observations per hectare. During the survey soils were examined by a combination of pits and augerings to a maximum depth of 1.05 m.

8.4.5 The survey showed that most of the land is covered by a variable depth of, but generally shallow, light and medium textured soils over sandstone. The very dark topsoil is most commonly sandy loam in texture and has a small percentage (2-5%) of stones. The subsoil is slightly more clayey and grades into a sandstone dominant layer at a depth of 30-50cm. Yellowish brown colours and organic inclusions in it indicate past podzolisation.

8.4.6 An example profile from SE 12087 14511 (Map 4) described below:

0-26 cm Very dark brown (10YR 2/2) medium sandy loam; 5% subangular tabular large (and some medium) sandstones; strongly developed fine subangular blocky structure grading to moderately developed fine to medium subangular blocky structure downwards; very friable; no visible macropores but good earthworm population; many very fine fibrous roots; abrupt irregular boundary to:

26-45 cm Dark yellowish brown to yellowish brown (10YR 3/6, 4/6 and 5/6) sandy clay loam with many darker (7.5YR 3/2) more organic zones; 15% large tabular subangular sandstones; weak structure dominated by stones; friable; no visible macropores; few to common very fine fibrous roots; irregular boundary to sandstone.

45+ cm Sandstone dominant with some interstitial soil similar to above layer.

Agricultural Quality

8.4.7 To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF Agricultural Land Classification (ALC) system classifies land into five grades numbered 1 to 5, with grade 3 divided into two sub-grades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

8.4.8 The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification. The relevant site data for an average elevation of 200 m is given below.

- Average annual rainfall: 972 mm
- January-June accumulated temperature >0°C 1195 day°
- Field capacity period 232 days
  (when the soils are fully replete with water) mid Sept early May
- Summer moisture deficits for: wheat: 62 mm
  potatoes: 41 mm

8.4.9 The survey described in the previous section was used in conjunction with the agroclimatic data above to classify the site using the revised guidelines for agricultural land classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food4. The climate limits the land quality to no better than subgrade 3a.

Survey Results

8.4.10 The agricultural quality across the survey area is determined by a mixture of climatic and soil depth limitations. Land is freely draining, but crops on the shallowest soils can be subject to drought. Land of sub-grades 3a and 3b agricultural quality is present, with a small area of non-agricultural land.

Sub-grade 3a

8.4.11 Just under half the site is accounted for by this sub-grade. Soils here are typically deeper, at around 50 cm depth before grading into sandstone. The soils are loamy in texture and freely draining.

Sub-grade 3b

8.4.12 This sub-grade accounts for 56% of the agricultural land. These soils are generally medium sandy loams but are much shallower, passing to sandstone at around 30 cm depth. This shallow depth impedes cultivation increases the risk of crop yield being reduced by drought.

Grade areas

8.4.13 The boundaries between the different grades of land are shown on Map 2 and the areas occupied by each are shown below.

Table 1. Areas within the survey area occupied by the different land grades

Grade/sub-grade	Area (ha)	% of agricultural land
Sub-grade 3a	2.8	44
Sub-grade 3b	3.9	56
Non agricultural	0.3	-
Total	7.0	100

Soil resources and their use

8.4.15 Government policy as outlined in the Defra Soil Strategy for England and Mineral Planning Guidance No 7 Reclamation of Mineral Workings is to protect valuable soil resources from loss or damage during land disturbance and ensure that stripped soils are used either for land reinstatement after quarrying or other beneficial use off-site.

8.4.16 There are two soil resources units within sub-grade 3a, a topsoil and a subsoil. Within the areas designated sub-grade 3b, there is only topsoil which grades into sandstone at shallow depths. Soils are described below.

Topsoil

8.4.17 Most of the soils at the site have medium sandy loam topsoil. It is a good resource and not as easily damaged as other soil types when wet, although care still needs to be taken.

Subsoil

8.4.18 This comprises of 20-25 cm of stony medium loam subsoil across the areas where sandstone-dominated material is not encountered immediately below the topsoil (see Map 1). It is a good resource and should be stripped and stored separately for later use in restoration.

Use of soils in restoration

8.4.19 Topsoil and subsoil horizons should be stripped and stored separately wherever possible on this site to enable restoration of grade 3a land afterwards.

8.4.20 Not all the site has the resource to enable separate topsoil and subsoil stripping, but an area of 2.8 ha does, potentially yielding about 4,000-4,500 m3 within the 4.23 ha proposed extraction area. The topsoil, stripped to an average depth of 275 mm will potentially yield 11,500-12,000 m3 of resource.

Soil handling and restoration

8.4.21 All soil resources are easily damaged by being stripped or moved when wet. Consequently, stripping should only take place in the driest parts of the year, using the excavator and dumper method as described by Sheet 1 in the MAFF

8.4.22 If direct placement of stripped soils onto areas being restored is not possible, the resources should be stripped and stored separately in low bunds (no more than 3 m high for topsoil). Topsoil should be stripped from areas designated for storing subsoil. The bunds should be constructed either by excavator or bulldozer (Sheets 2 and 14 in the MAFF Good Practice Guide) avoiding overcompaction. They should be sown with grass to help maintain biological activity and prevent water erosion.

8.4.23 The soils should be removed from storage (Sheet 3 in the MAFF Good Practice Guide) and replaced by excavator during the summer using the loose tipping technique (Sheet 4 in MAFF Good Practice Guide), which avoids traffic on the restored surfaces.

8.5 DUST AND AIR QUALITY

Introduction

8.5.1 Silkstone Environmental Ltd instructed DustScan Ltd to undertake an assessment of the potential impacts on local air quality that could arise as a result of the proposal.

8.5.2 The report has been prepared following a site inspection and a comprehensive programme of PM10 and dust monitoring near the existing and proposed quarry sites.

8.5.3 The following sections summarise the full report by Dustscan Ltd which can be found in Appendix 4 of the Technical Appendices.

Regulatory and Environmental Context

8.5.4 'Dust' is generally regarded as particulate matter up to 75 µm (micron) diameter and can be considered in two categories. Fine dust, essentially particles up to 10 µm, is commonly referred to as PM10. Coarser dust (essentially particles greater than 10 µm) is generally regarded as 'nuisance dust' and can be associated with annoyance through visual impacts.

8.5.5 PM10 is measured to agreed standards and forms part of national Air Quality Objectives (AQO) but there are no official standards (such as AQO) for nuisance dust.

8.5.6 Some quarry processes are regulated under environmental legislation. PGN 3/08(12) states some mineral processing activities, such as crushing, grinding, screening and grading of wet material are prescribed under LAPC/LAPPC (Local Air Pollution Control/Local Air Pollution Prevention and Control) in relation to emissions of particulate matter (dust). Other quarry processes, including drilling, blasting and extraction of minerals, overburden removal and the cutting and dressing of stone are not prescribed processes thus are exempt from LAPC/LAPPC regulation.

8.5.7 Therefore, from the above, no prescribed processes would be undertaken at Thewlis Lane Quarry. However, standard good practice for quarry operations, as set out in PGN 3/08(12) and elsewhere are relevant. The essence of good practice guidance is the control of emissions through effective site management.

Dust generation and propagation

8.5.8 Although it is a widespread environmental phenomenon, dust is also generated through many human activities. This includes at hard rock quarries and other minerals sites, but also by heavy industry, waste management, construction and demolition, agriculture (especially arable farming) and road transport.

8.5.9 Dust is generally produced by mechanical action on materials and is carried by moving air when there is sufficient energy in the airstream. More energy is required for dust to become airborne than for it to remain suspended.

Dust is removed through gravitational settling (sedimentation), washout (for example during rainfall or by wetting) and by impaction on surfaces (*e.g*. on vegetative screening). Dust can be re-suspended where conditions allow, such as from bare ground.

8.5.10 Dust emissions, propagation and potential impacts can be considered in terms of 'source-pathway-receptor' relationships. Dust can arise from a variety of processes and locations within a minerals site and, because it does not originate from a single 'point' source such as a chimney stack or flue is often considered 'fugitive'. Fugitive dust emissions are difficult to quantify but various localities and processes at minerals sites can be identified as potential sources of fugitive dust.

8.5.11 The common pathway for dust propagation is by air. Dust propagation depends on particle size, wind energy and disturbance activities. Large dust particles generally travel shorter distances than small particles. It is often considered that particles greater than 30 µm will largely deposit within 100 metres of sources, those between 10 – 30 µm to travel up to 250 – 500 metres and particles less than 10 µm to travel up to 1 km from sources2.

8.5.12 Dust receptors can be within or beyond the site boundaries. Whilst dust generation within a minerals site is primarily of concern to its operator, staff and visitors, dust can propagate beyond the site boundary to affect people and properties beyond unless adequate control measures are in place.

8.5.13 Impacts of dust from minerals sites can occur in terms of AQO or annoyance. It is important to recognise that there may be other dust sources in the vicinity of a minerals site (such as other land uses and road traffic).

Weather

8.5.14 Local weather conditions can have a significant effect on the potential for dust propagation from a minerals site. Of particular importance are wind speed (and direction) and precipitation.

8.5.15 Dust can be carried from a source towards receptors (such as nearby homes and other businesses) according to the strength and direction of wind. Precipitation is recognised to suppress dust and 0.2 mm antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours. Table 1 is a summary of wind speeds and associated potential for dust propagation, derived from relevant guidance.

Table 1: Summary of wind speeds and associated potential for dust propagation (after AEA Technology plc, 2010)

Wind speed (m/s)	Description
Below 0.5	essentially calm, very low potential for dust movement
0.5 – 2	low wind speeds, low potential for dust movement
2 – 6	'average' wind speeds, moderate potential for dust movement

6 – 10	high wind speeds, reasonable potential for dust movement
Above 10	very high wind speeds, significant potential for dust movement

PM10

8.5.16 As with other local authorities, Kirklees Council is required to review and assess air quality in the district as part of Local Air Quality Management (LAQM). Assessments are made for the pollutants set out in AQO, including PM10.

8.5.17 For this assessment, ambient PM10 concentrations were determined in the locality of Thewlis Lane Quarry on 3 days during May – August 2012.

Visible 'nuisance' dust (directional and deposited dust)

8.5.18 'Nuisance' dust is more readily described than defined as it relates to the visual impact of short-lived dust clouds and the long-term soiling of surfaces. Nuisance dust is commonly measured by direction and in deposition. Directional dust flux is the horizontal passage of dust past a point, usually driven by the wind; dust deposition is the vertical passage of dust to a surface, driven by deposition velocity.

8.5.19 The expression 'nuisance dust' relates to the human perception of, or reaction to, some aspect of dust pollution, such as the long-term soiling of surfaces or the visibility of short-lived dust clouds. In the absence of standards, 'custom and practice' criteria for assessing nuisance dust have been developed.

8.5.20 The two principal approaches to the assessment of nuisance dust are based either on measurement of the mass of settled dust or the assessment of change in the properties of a surface such as its loss of reflectance or discolouration ('soiling') on a glass microscope slide (reported as soiling units, s.u.) or an adhesive 'sticky pad' (reported as effective area coverage, EAC and/or absolute area coverage, AAC)..

8.5.21 For this report, directional and deposited dust levels were measured at 3 locations at or near the proposed site boundary using 'sticky pad' type dust samplers. Samples were taken in the vicinity of the existing quarry operations at Crosland Moor Quarry, on the boundary of the extension area and at a potential receptor beyond the proposed quarry area.

8.5.22 The results have been assessed in relation to the appropriate criteria and could be used to regulate environmental compliance and assess the efficacy of dust control measures at Thewlis Lane Quarry.

Dust receptors

8.5.23 The Technical Guidance to the NPPF (NPPF(TG)) provides guidance for dust assessment and mitigation for minerals operations and sets out a Site Assessment Flow Chart to determine the potential impact of dust from mineral processes on local air quality.

8.5.24 The potential for dust impacts at off-site receptors will depend on their sensitivity to dust, their proximity to the site operations, the duration of potential exposure and the direction of the mineral operations in relation to the receptor.

8.5.25 Consequently, where residential properties or other sensitive land uses are within 1 km of site activities the potential for PM10 emissions to cause a breach of AQO should be assessed. Where PM10 emissions from site activities are unlikely to cause a breach of AQO the site should apply good practice measures in dust management to avoid causing dust nuisance, such as set out in PGN 3/08(12).

8.5.26 Consideration of the 'sensitivity' of potential receptors to the impacts of dust is also set out in NPPF(TG), which provides a table of examples of dust-sensitive facilities. (For example, it is recognised that hospitals and clinics are of 'high' sensitivity to dust. Schools and residential areas are typically of 'medium' sensitivity and farms and other industry are generally of 'low' sensitivity to dust.

8.5.27 There are many potential dust receptors in the vicinity of the proposed quarry at Thewlis Lane. As set out elsewhere, the potential reserve area of the quarry has been reduced by adopting a minimum 100 m stand-off from occupied properties.

8.5.28 Residential properties extend to the north, east and south of the extension area, essentially off Sandene Avenue to the north, Balmoral Avenue and Butternab Road to the east and Moor Park Avenue to the south. Crosland Moor Junior School and St Luke's Hospital Ward 2 are located approximately 600 m and 750 m respectively to the north-north-east of the proposed extension area. Moor End Technology College is located approximately 500 m to the east-north-east and there is a range of industrial land uses to the north and north-west of the proposed quarry extension, beyond Blackmoorfoot Road.

Dust sources

8.5.29 The quantity and size range of dust likely to be generated at a minerals site depends on the type of material being worked and the processes applied. Friable materials such as coal or chalk can disaggregate easily to produce dust, but dust can also be produced from drilling and blasting hard rock such as granite or from disturbing dry sand or gravel.

8.5.30 PGN 3/08(12) states that dust emissions can arise from a range of processes at quarry sites. These include crushing and grinding, screening, loading and unloading, on-site transfer of dusty materials, stockpiles and roadways, including haulage roads.

8.5.31 Potential dust sources at Thewlis Lane Quarry have been identified and are considered below.

a) Soil stripping, storage and reinstatement

8.5.32 There is potential for high levels of dust emission from soil stripping, storage and reinstatement although these are generally short-term, transient operations. At Thewlis Lane Quarry, soils would be stripped by hydraulic excavator and transported using articulated dump trucks to form perimeter screening bunds within the quarry.

8.5.33 Unacceptable dust emissions would be controlled by minimising working of soil in very dry, windy conditions, by reducing drop heights at material transfer points and controlling vehicle speeds. Soils handling would be suspended near the northern, eastern and southern boundaries of the proposed quarry when the wind conditions are likely to result in visible dust being carried towards off-site receptors.

8.5.34 The perimeter soil bunds would be seeded and maintained to stabilise exposed surfaces and minimise wind-blow. Areas of stripped ground and other areas of loose or bare ground would be watered as necessary to minimise the potential for windblown dust. During site restoration the perimeter soil bunds would be taken down and spread over the area of the site to reinstate original levels.

b) Overburden removal, storage and reinstatement

8.5.35 There is a potential for a moderate to high levels of dust emission during overburden handling, storage and replacement, although overburden can usually be worked at high moisture contents thus reducing the risk of unacceptable dust emissions. Overburden at Thewlis Lane Quarry would be removed by hydraulic excavator and transported by articulated dump truck for backfill within Crosland Moor Quarry.

8.5.36 The quarry void at Thewlis Lane Quarry would be progressively backfilled with compacted shale brought from Crosland Moor Quarry and Waterholes Quarry. The shale would be transported by articulated dump truck and spread, then compacted in the quarry void prior to replacement of soils.

c) Mineral extraction

8.5.37 The block stone at Thewlis Lane Quarry is of high quality and would be extracted using long-established methods that minimise rock fracturing and thus reduce dust emissions. Drilling is kept to a minimum and, as elsewhere on the site, there would be no blasting.

8.5.38 The extracted mineral would be transported by articulated dump truck to the existing processing plant immediately to the west of Thewlis Lane. Although there is a low risk of dust emissions from mineral extraction there is a high risk from transport on unpaved roads.

d) Mobile plant

8.5.39 There is a high risk of dust emissions from transport on unpaved roads hence vehicle speeds should be controlled and surfaces wetted with the on-site bowser as required.

8.5.40 There is a risk of dust being generated from downward-blowing exhausts and cooling fans and mobile plant exhausts and cooling fans would discharge above the horizontal to minimise dust generation. All site haulage would keep to the designated haul routes.

8.5.41 Unmade access roads would be kept in good repair and would be wetted as required with the water bowser. Vehicle speed limits would be determined by the Quarry Manager based upon the site and weather conditions pertaining at the time. Vehicles crossing Thewlis Lane would be checked for loose deposits that could fall onto the public highway. Any spillages onto Thewlis Lane would be cleared immediately and, as at present, the road surface cleaned and swept as required by mechanical sweeper. Mobile plant would be cleaned as necessary at the existing facilities within the stone processing plant.

e) Wind-whip from bare ground and exposed surfaces

8.5.42 There is a moderate risk of dust propagation from dry surface layers of stripped surfaces, freshly-constructed soil storage bunds prior to seeding and from bare ground (such as unpaved haul roads).

8.5.43 Dust emissions from exposed surfaces would be minimised by wetting down with the water bowser as necessary, especially in periods of dry, windy weather.

Risk estimation

8.5.44 In general, the risk of adverse impacts due to dust can be estimated by considering the scale of the operations involved and the proximity of potential receptors. Recent guidance for the construction industry is relevant to an assessment of the risk of dust emissions from ground-disturbing operations at Thewlis Lane Quarry

8.5.45 From the IAQM guidance, the Dust Emission Class for the site can be determined from a number of relevant factors including the total site area, the number and type of plant used, the soil type and the height of screening bunds.

8.5.46 Although the total site area at Thewlis Lane extends over greater than10000 m2, and thus could be considered to fall into the Large Dust Emission Class, other factors demonstrate that ground-disturbing operations at the proposed quarry are likely to fall within the Small Dust Emission Class. Unlike a construction site, potentially dusty operations at Thewlis Lane Quarry would occur over relatively short periods of time over different parts of the site and, for example, it is anticipated that there would be fewer than 5 heavy earth-moving vehicles active at any one time at the site.

8.5.47 As noted above, the nearest receptor to the proposed operations at Thewlis Lane Quarry would be no closer than 100 m. Consequently, from the above, the risk of PM10 and dust emissions from the proposed extension area (without mitigation) is considered to be Low – Negligible.

DUST ASSESSMENT

8.5.48 The potential impacts from the proposed quarry extension are considered in relation to a programme of PM10 and dust monitoring in relation to local weather data. The dust monitoring locations and methods used for this study were selected to reasonably represent and assess PM10, directional and deposited dust levels at the proposed site boundary and near off-site receptors.

Weather data

8.5.49 The wind rose for the duration of the dust monitoring study (14 May – 31 August 2012) shows that winds were typically bidirectional during the study period, with no winds exceeding 10 ms-1. Approximately 2% of winds were in the range 6 – 10 ms-1. Approximately half of winds (53%) were below 2 ms-1.

PM10

8.5.50 PM10 levels were measured over 3 days during May – August 2012. Please refer to the full report contained in Appendix 4 of the Technical Appendices for the full details.

8.5.51 PM10 concentrations were measured over 15-minute intervals using a Quest Technologies EVM air quality sampler.

8.5.52 Although indicative, the PM10 concentrations obtained during the study period appear to correspond reasonably to values obtained by Kirklees Council at other locations. PM10 samples were taken in the vicinity of quarry operations north-east of Crosland Moor Quarry and south-west of Hill Tree Park as well as at existing receptor locations north-east of the proposed extension area and to the rear of properties off Sandown Avenue.

PM10 risk estimation

8.5.53 It is important to note that the PM10 concentrations recorded in this study were obtained over relatively short sampling intervals using a hand-held instrument. However, this study indicates that PM10 concentrations in the immediate vicinity of existing quarry operations (and similar to those proposed at Thewlis Lane Quarry) would be very unlikely to lead to a breach in AQO objectives at any relevant exposure location.

8.5.54 Therefore, from the above, the risk that PM10 emissions associated with Thewlis Lane Quarry causing a breach of AQO thresholds for Kirklees Council can be considered to be negligible.

Visible 'nuisance' dust

8.5.55 For this study, baseline directional and deposited dust levels were monitored at 3 locations over 3 months at or near the site using DustScan samplers. Samples were taken over weekly intervals in accordance with the supplier's instructions.

8.5.56 The directional dust monitoring component of the device samples fugitive dust coming from 360° around the gauge and the deposited dust monitoring component collects dust depositing from the air onto a horizontal surface.

8.5.57 Assessment of dust coverage on the sticky pads uses a computer-based scanning system. The results are normally reported in two dust measurements:

- Absolute Area Coverage (AAC) – the presence of dust irrespective of colour
- Effective Area Coverage (EAC) – the darkness or potential soiling of dust

8.5.58 AAC and EAC are measures of the visual effects of dust, irrespective of mass. AAC may reach 100 % quite frequently and in most cases AAC will be higher than EAC for the same dust sample. This is due to most dusts (e.g. soil, sand and clay) not being very dark coloured.

8.5.59 The soiling effect of dust measured as AAC and EAC value depends on the characteristics of dust, particularly its colour and contrast, but does not necessarily relate to the mass of dust.

8.5.60 The baseline directional and deposited dust data at Thewlis Lane Quarry are discussed in full in the main report in Appendix 4 of the Technical Appendices.

Directional dust

8.5.61 The baseline directional dust monitoring data study has shown that directional dust levels were generally coincident with the predominant wind directions during the baseline study period. Directional dust was generally at levels associated with a Very Low 'risk' of annoyance although it is probable that dust levels were reduced by an unknown factor due to precipitation.

Directional dust risk estimation

8.5.62 The likelihood of adverse impacts from directional dust from site activities at Thewlis Lane Quarry can be assessed from knowledge of the proposed site operations, the baseline dust data and the annual wind data.

8.5.63 The potential for dust emissions from various stages of site operations at Thewlis Lane Quarry has been determined. Whilst there is a high potential for dust emissions from some processes, these are generally short-term and can be controlled with effective site management.

8.5.64 Provision of a 100 m minimum stand-off between the site boundary and off-site receptors should ensure that the majority of coarse dust particles (*i.e.* those generally associated with annoyance) should deposit prior to reaching property boundaries

8.5.65 The wind rose data shows that the prevailing wind direction was westerly and that approximately 8% winds were in the range 6 – 10 ms-1. Therefore, there may be a 'reasonable' risk of dust propagation towards the east (*i.e.* towards residential properties) during approximately 29 days per year.

8.5.66 As noted above, potentially dusty operations (*e.g.* soil stripping) would not take place continuously or across the entire site area simultaneously.

8.5.67 Consequently, provided that care is taken to avoid potentially dusty operations during dry, windy weather, the risk of fugitive dust adversely affecting off-site receptors is very low.

Deposited dust

8.5.68 The baseline deposited dust data has shown the potential 'risk' of annoyance due to deposited dust can be determined from AAC and EAC.

8.5.69 The results show that deposited dust was generally at levels associated with a Very Low 'risk' of annoyance throughout the study period. On one occasion (20 – 27 June 2012) dust fall at monitoring point DM3 to the east of the current workings at Crosland Moor Quarry reached levels associated with a Medium 'risk' of annoyance.

Deposited dust risk estimation

8.5.70 As with directional dust, the risk that deposited dust from site activities at Thewlis Lane Quarry will cause adverse impacts can be assessed from descriptions of the proposed site operations, the baseline dust data and, to an extent, the annual wind data.

8.5.71 From the above, whilst there is a high potential for dust emissions during soil stripping and other generally short-term site operations at Thewlis Lane Quarry, the provision of a 100 m stand-off between the operational site boundary and the nearest off-site receptors should ensure that most coarse dust particles do not reach neighbouring receptors.

8.5.72 Consequently, provided that care is taken to avoid dust generation during periods of dry, windy weather, the risks of dust deposition from site operations at Thewlis Lane Quarry causing adverse impacts is very low.

DUST MITIGATION AND CONTROL

8.5.73 The risks of adverse impacts of PM10, and directional and deposited dust arising from site operations at Thewlis Lane Quarry have been estimated to be low or near zero at receptors beyond the site boundary.

8.5.74 Specific processes liable to give rise to dust have been identified and control measures have been identified. To minimise potential impacts from dust, the quarry would be operated in accordance with best practice and

(although no prescribed processes would be carried out) the guidance in PGN 3/8 (12). The essence of the guidance in PGN 3/8 (12) is that dust emissions can be controlled through effective site management.

8.5.75 The measures for the management and control of dust at the quarry would comply with any conditions which may be specified by the Mineral Planning Authority (MPA). The Quarry Manager would refer to the planning conditions, to determine the appropriate response to potential or actual dust emissions, taking into account current and forecast weather conditions.

8.5.76 Visual inspections of the site would be carried out by the Quarry Manager at the start of operations and subsequently as necessary (particularly during dry, windy weather) to ensure that all potential or actual dust sources are identified and treated promptly.

8.5.77 Furthermore, if any operations are identified as causing or likely to cause visible dust emissions across the boundary of the proposed quarry, those operations would be modified, reduced or suspended until effective remedial action can be taken or the conditions giving rise to the emissions have moderated.

8.5.78 General matters and the management of the site can affect the likelihood of significant dust emissions. These include:

- use of clean water for dust suppression, to avoid re-circulating fine material;
- high standards of house-keeping to minimise track-out and wind-blown dust
- a preventative maintenance programme, including readily available spares, to ensure the efficient operation of dust suppression equipment; and
- effective staff training in respect of the causes and prevention of dust.

8.5.79 Dust management procedures at Thewlis Lane Quarry would be reviewed after 6 months of site operation.

SUMMARY

8.5.80 This dust assessment has been prepared as part of an Environmental Impact Assessment (EIA) by Silkstone Environmental Ltd for a proposed quarry extension onto land adjacent to Thewlis Lane, Kirklees, Huddersfield by Johnsons Wellfield Quarries Ltd.

8.5.81 The dust assessment has been carried out with reference to current regulatory and best practice guidance and was prepared following a site inspection and a programme of PM10 and dust monitoring near the existing and proposed quarry operations.

8.5.82 The proposed Thewlis Lane Quarry would involve a continuation of the current operational procedures at Johnsons Wellfield Quarries where high quality dimension stone is extracted by hydraulic excavator following mechanical splitting and breaking out. No blasting would be involved and all rock cutting would take place at the existing processing facilities.

8.5.83 There are residential dwellings no closer than 100 m to the north, east and `south of the proposed quarry and there are sensitive receptors within 1 km of the proposed quarry extension. However, the risk that potentially adverse PM10, directional or deposited dust impacts would occur at off-site receptors would be very low or negligible.

8.5.84 This study has shown:

- Potential sources of dust emission associated with different operations at Thewlis Lane Quarry have been evaluated;
- The risks of adverse impacts of dust on off-site receptors have been considered;
- Background PM10 levels in the locality of the proposed quarry extension are likely to be within AQO thresholds and from baseline monitoring, PM10 levels in the locality are unlikely to exceed AQO levels as a consequence of this proposal;
- Local weather data have indicated that prevailing winds are typically westerly and approximately 8% of daily average speeds may reach levels associated with a 'reasonable' risk of dust propagation by wind;
- From directional dust monitoring at existing and proposed quarry operations, directional dust levels were generally at levels associated with a Very Low 'risk' of dust annoyance and dust propagation generally occurred in the direction of the prevailing winds;
- Deposited dust levels were generally at levels associated with a Very Low 'risk' of dust annoyance; and
- Site management procedures and control measures to control dust emissions have been specified.

8.5.85 In conclusion, provided that the current high standards of site management currently in place elsewhere at Johnsons Wellfield Quarries are maintained, and appropriate attention paid to avoiding dust propagation during dry, windy weather, dust emissions from the proposed quarry extension into Thewlis Lane Quarry are considered to be unlikely to cause a breach of current AQO levels for PM10 or to be at levels with a significant risk of annoyance to neighboring receptors.

8.6 NOISE

Introduction

8.6.1 Silkstone Environmental Ltd was commissioned by Johnsons Wellfield Quarries Ltd to carry out an independent noise assessment of the proposed development.

8.6.2 This section of the report summarises the noise issues associated with the proposed development. The full noise report is set out within Appendix 5 of the Technical Appendices.

8.6.3 The noise impact assessment was required to have particular regard to the likely effect of noise on nearby noise sensitive properties (NSP's), and to identify each phase of the proposed development and associated noise levels.

8.6.4 The noise assessment was carried out in accordance with the relevant current best practice guidelines and criteria, and was sufficiently robust to conclude full details of the likely noise impact from the proposed development should planning permission be granted.

8.6.5 The noise assessment considered the cumulative noise impact associated with the existing planning permitted Airfield, Waterholes, and Moorfield quarries (all located nearby) and the proposed development. The quarries at Airfield, Waterholes, and Moorfield are collectively referred to as Crosland Moor.

8.6.6 Sound power level data for plant and equipment used in the assessment was provided from two sources including the previous noise assessment report for the current planning permitted activity, and reference data from BS5228 were appropriate.

8.6.7 Noise control and mitigation measures are provided in the assessment report to be implemented at the proposed development.

8.6.8 The findings of the noise assessment are presented in the context of the existing noise climate, and predicted noise levels for the proposed development and the likely impact on NSP's.

RELEVANT GUIDANCE AND ASSESSMENT CRITERIA

8.6.9 The relevant guidance and assessment criteria for the proposed development were identified as follows; National Planning Policy Framework (NPPF) Technical Guidance British Standard 5228-1 2009

8.6.10 It was agreed with the planning authority that the noise assessment criteria to be used for the proposed development would be that detailed in the NPPF Technical Guidance document (published March 2012). The NPPF Technical Guidance replaced the previous MPS2 guidance document.

Noise Assessment Criteria

8.6.11 The recently published NPPF Technical Guidance described noise criteria for minerals planning applications. The guidance detailed the considerations in assessing noise impact from proposed minerals development, and provided upper noise limits for quarrying activity.

8.6.12 The sections of NPPF Technical Guidance which specify the criteria for assessing and minimising noise impact from proposed development were published as follows;

"*28. The National Planning Policy Framework makes it clear that minerals planning authorities should ensure that unavoidable noise emissions are controlled, mitigated or removed at source. It further recognizes that mineral planning authorities should also establish appropriate noise limits for extraction in proximity to noise sensitive properties."*

"29. Those making development proposals should carry out a noise emissions assessment, which should identify all sources of noise and, for each source, consider the proposed operating locations, procedures, schedules and duration of work for the life of the operation. Proposals for the control or mitigation of noise emissions should consider: the main characteristics of the production process and its environs, including the location of noise-sensitive properties; proposals to minimise, mitigate or remove noise emissions at source; assessing the existing noise climate around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties; estimating the likely future noise from the development and its impact on the neighborhood of the proposed operations; monitoring noise emissions to ensure compliance with appropriate environmental standards."

"30. Subject to a maximum of 55dB(A)LAeq, 1h (free field), mineral planning authorities should aim to establish a noise limit at the noise-sensitive property that does not exceed the background level by more than 10dB(A). It is recognised, however, that in many circumstances it will be difficult to not exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near that level as practicable during normal working hours (0700-1900) and should not exceed 55dB(A) LAeq, 1h (free field). *Evening (1900-2200) limits should not exceed background level by more than 10dB(A) and night-time limits should not exceed 42dB(A) LAeq,1h (free field) at noise-sensitive dwellings. Where tonal noise contributes significantly to the total site noise, it may be appropriate to set specific limits for this element. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise - e.g. Lmax in specific octave or third-octave bands - and should not be allowed to occur regularly at night. "*

> ***"31. All mineral operations will have some particularly noisy short-term activities that cannot meet the limits set for normal operations.***
> ***Examples include soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance. However, these activities can bring longer-term environmental benefits. Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to 8 weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs****. Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum."*

British Standard 5228; Noise and vibration control on construction and open sites

8.6.13 BS5228 provided a methodology for the prediction and measurement of noise associated with activity including construction and industrial development, and for open sites. The standard also provided information relevant when assessing noise impact on those affected by it.

8.6.14 BS5228-1 also provided sound power level data (in reference tables) for various plant and machinery appropriate for noise assessment. Sound power level data from reference tables was used in the noise assessment where existing data was not available.

8.6.15 Existing sound power level data for plant at the existing planning permitted quarries was also used in the noise assessment as applicable.

8.6.16 BS5228-1 makes reference to appropriate methods for noise reduction, which should be considered for certain forms of development. Noise reduction measures considered relevant and therefore to be implemented at the proposed development included (but not limited to);

- Avoiding unnecessary revving of engines and switching off equipment not in use;
- Keeping internal haul roads well maintained and avoid steep gradients;
- Minimise drop heights of materials;
- Start up of plant sequentially rather than all together;
- Movement of plant onto and around the site to have regard to normal operating hours and location of noise sensitive properties (NSP's) as far as is reasonably practicable;

- Consideration of suitable audible reverse alarms which, whilst ensuring that they give proper warning, have minimal noise impact outwith the site;
- Modification of existing plant and equipment by the application of improved sound reduction methods;
- Use of enclosures for static plant where practicable;
- Use and siting of equipment, i.e. care taken to site equipment away from noise-sensitive areas. Where possible loading and unloading should also be carried out away from such areas and orientation of plant optimised to minimise noise direction towards NSP's.
- Regular and effective maintenance of plant
- Where practicable, construct the outer part of any proposed baffle mound so that the remaining work on the mound is shielded from NSP's.

8.6.17 In addition to the noise reduction methods stated, the operator would implement the noise measures specified in the existing Noise Management and Monitoring Scheme (dated July 2010) at the proposed development.

Soundplan Modelling and Paremeterisation

8.6.18 SoundPlan noise modelling software was utilised to determine the noise impact from the proposed development at Thewlis Lane Quarry.

8.6.17 SoundPlan provided a simulation of noise propagation from plant and machinery associated with the development. The software also enabled the cumulative affect of noise from the exiting planning permitted quarry activity at Crosland Moor to be assessed.

8.6.17 A number of SoundPlan models were generated and each was parameterised based on specific operational details provided by the applicant related to the type, number, and location of plant, operational periods, and the proposed phasing of mineral extraction.

8.6.18 SoundPlan software enabled a replication of topographic and structural detail of the assessment area. The modelling software also considered the ground type, and structural detail such as bunds, walls and reflective surfaces. Sound Power Levels (LWA) for individual items of plant were simulated taking account of percentage on time, etc.

8.6.19 The core calculation model of SoundPlan used for simulating the existing and proposed development, utilised British Standard BS5228 and ISO9613-2:1996 methodology. The two standards are accepted methodology for calculating noise propagation.

8.6.20 A combination of site specific topographic details and ground level data purchased from Ordnance Survey were used to create the ground terrain model (GTM) of the study area. The terrain model was therefore considered an accurate replication of topography at the site location.

8.6.21 The type and location of modelled plant/equipment was as detailed by the applicant to accurately replicate the proposed development. The SoundPlan model calculations are therefore considered to be accurate.

Existing Noise Climate

8.6.22 A noise survey was carried at noise sensitive properties (NSP's) at closest proximity to the proposed development. The location of NSP's considered in the noise assessment were agreed in advance with the Planning Authority Environmental Health Officer (EHO).

8.6.23 The proposed development included aspects of quarrying activity at existing planning permitted areas of the quarry. Noise monitoring was previously carried out at several NSP's as required by conditions of the existing permission.

8.6.24 It was agreed with the EHO that historic noise level data at relevant NSP's would be suitable for use in the noise assessment. Historic noise level data was available at Hadden Farm, Airfield Bungalow, and Justin Way (Hill Tree Park)

8.6.25 The nearest NSP's to the proposed development, as agreed with the planning authority EHO, comprised the following;

- Hadden Farm
- Airfield Bungalow
- Justin Way, Hill Tree Park
- Victoria Place, Hill Tree Park
- Ballater Avenue
- Sutherland Drive
- Moor Park Avenue
- Delves Wood Road

8.6.26 Noise survey positions were set up at each NSP (excluding historic data NSP's) and 1hr LAeq free-field sound pressure level readings were recorded. The process was repeated for a further two visits on separate days. A free-field 1hr LAeq sound pressure level reading was recorded on 31/08/12, 03/09/12 and 04/09/12 at each NSP.

8.6.27 Historic noise survey data was used for NSP's at Hadden Farm, Airfield Bungalow, and Justin Way (Hill Tree Park). Historic noise survey data for the three identified properties comprised 7 hours of measurements recorded between February 2011 and August 2012.

8.6.28 Full details of the set up position, climate, identifiable noise sources, and extent of quarry operations during noise survey periods were provided in separate log sheets in the full report found in Appendix 5 of the Technical Appendices.

Noise Level Predictions

8.6.29 Noise level predictions calculated using SoundPlan modelling software considered the cumulative affect of noise from the existing and proposed development. The predicted noise levels were provided as continuous free field noise levels measured in dB LAeq.

8.6.30 There were a range of factors which influenced the level of noise propagation associated with proposed development. The most significant factors considered in the noise assessment were;

- Plant sound power levels (SWL's).
- Percentage on time.
- Distance between the noise source and noise sensitive receptor.
- Ground characteristics between noise source and receptor including ground type and physical obstructions such as baffle mounds.
- Reflection of noise from building facades.

Prediction Methodology

8.6.31 The noise prediction methodology used in the SoundPlan modeling simulations were British Standard BS5228 and ISO9613-2:1996. The simulation results therefore conform to accepted prediction methodologies for the proposed development.

8.6.32 Eight separate phases of development were designed by the applicant to combine the existing and proposed quarry development. SoundPlan models used in the noise assessment replicated each of the eight separate phases. Further sub-phase models were created for the eight phases which assessed the following;

8.6.33 Typical operations (noise sources located in the centre of the extraction area and at mid-depth of excavation).

8.6.34 Typical operations – worst case (noise sources located at closest proximity to NSP, immediately behind the baffle mound, at ground level after soil stripping).

8.6.35 Temporary operations (activities of a temporary nature such as soils stripping and baffle mound construction – noise sources located at ground level at closest proximity to NSP).

8.6.36 The prediction calculations therefore provided a range of anticipated noise levels from typical operations (including worst case scenario) for each phase of the development.

8.6.37 Prediction calculations also accounted for HGV movements on all haul roads based on calculation methodology provided in BS5228-1 (2009).

8.6.38 Plans showing the details of each separate phase of the proposed quarrying development are provided in Appendix B of the full report.

Noise Prediction Assumptions

8.6.39 A number of assumptions were applied during noise prediction modelling.

8.6.40 These related to operational specifics of the proposed quarry development. It was assumed that worst case scenario for noise generation would be when plant was operated at closest proximity to any particular NSP, and at minimum depth of excavation.

8.6.41 Noise generation from typical operations was assumed to be when plant was located centrally and at mid depth of excavation for each phase of the development.

8.6.42 Worst case scenario for temporary works such as bund creation was assumed to be when plant was located on the outer most extent of operations, and at closest proximity to the nearest NSP, prior to baffle mound formation.

8.6.43 Based on information provided by the applicant, three dump trucks in total would be utilised for quarrying operations. It was assumed that the realistic maximum number of movements along internal haul roads would be 20 movements per hour. This would in effect have meant a dump truck would be filled every six minutes during peak periods, and represented the realistic upper limit of movements for the development.

8.6.44 Dump truck routeing varied at the site from phase to phase, as the development progressed. Dump trucks movement was simulated in SoundPlan models as a single line noise source. Multiple line sources (all based on 20 movements per hour) were assigned for each potential haul roads, and all were simulated together. The model results therefore provided very conservative predictions with regards to noise from dump truck movements.

Site Plant Noise Assessment

8.6.45 The tables contained in the full noise assessment present the assessment results of predicted continuous free field noise levels at nearby NSP's, and comparison with the relevant assessment noise limit criteria.

8.6.46 Predicted free-field noise levels LAeq were compared with NPPF technical guidance criteria of no more than 10dB above background measurements (L90) where possible, or in any case against a maximum permitted level of 55dB for normal daytime quarrying activity.

8.6.47 The tables provide noise level data predictions associated with the cumulative and combined affect of all relevant plant noise at the site during each phase of the development. The predicted noise levels represent operations at closest proximity and shallowest depth, as well as more typical positions in central locations in each phase.

8.6.48 The assessment tables demonstrate that the proposed development at Thewlis Lane quarry would satisfy the noise limit criteria as specified in the NPPF Technical guidance note at all identified noise sensitive properties. Johnsons Wellfield Quarries Ltd

Discussion

Ballater Avenue

8.6.49 It was noted during the background noise survey period at Ballater Avenue, that noise from activity at the saw shed was clearly audible. The saw shed activity was audible due to the roller shutter door being fully open at the

time. A free-field measurement of the noise level at the saw shed was recorded, then modelled as a single point noise source emitted at the survey position in the SoundPlan models.

8.6.50 Generally, noise from planning permitted quarrying activity at Crosland Moor was audible to some degree at all noise sensitive property locations.

Hadden Farm

8.6.51 The noise assessment findings for Hadden Farm showed the maximum predicted noise levels for typical operations to be 40.9dB, during phase three of the proposed development.

8.6.52 Noise impact at Hadden Farm from phase three quarry operations would be generated by Airfield Quarry extraction operations that are already planning permitted.

8.6.53 The predicted noise levels at Hadden Farm associated with typical operations at the development satisfied the NPPF Technical guidance criteria of "*no more than 10dB above background*".

8.6.54 It was concluded that the predicted noise levels at Hadden Farm satisfied the NPPF Technical guidance limit criteria for the duration of the proposed development.

Airfield Bungalow

8.6.55 The background noise survey data for Airfield Bungalow showed the location to be greatly influenced by agricultural activity and airfield runway/hanger activity. The bungalow was also located in close proximity to the limit of excavation associated with the existing planning permitted quarry.

8.6.56 The maximum predicted noise levels at Airfield Bungalow from typical quarry operations at the development was 52.2dB, generated during phase eight activity. The predicted noise level did not satisfy the "*no more than 10dB above background*" criteria, but did satisfy the 55dB limit criteria for daytime quarry activity as stated in the NPPF technical guidance.

8.6.57 The worst case maximum predicted noise level at Airfield Bungalow during typical activity was 54dB, generated during phase six of the development. Again, the predicted noise level did not satisfy the "*no more than 10dB above background*" criteria, but did satisfy the 55dB limit criteria for daytime quarry activity.

8.6.58 The highest predicted noise level at Airfield Bungalow position was 69.8dB, generated during baffle mound engineering at Airfield quarry prior to quarrying in cut A9. As such work was considered essential and temporary; a 70dB limit criteria was therefore applicable for the activity in accordance with NPPF Technical guidance. The predicted noise level did satisfy the noise limit criteria for that particular location and activity.

8.6.59 It was concluded that the predicted noise levels at Airfield Bungalow did satisfy the NPPF Technical guidance limit criteria for the duration of the proposed development.

Justin Way (Hill Tree Park)

8.6.60 The existing noise climate at Justin Way (Hill Tree Park) was greatly influenced by significant traffic noise from the adjacent Blackmoorfoot Road. Measured background noise levels therefore provided a measurement of the extent of existing traffic noise impact.

8.6.61 Noise levels at Justin Way associated with typical operations (worst case) were predicted to peak at 50.5dB during phase four of the development. The predicted peak noise level at Justin Way did satisfy the "*no more than 10dB above background*" criteria.

8.6.62 It was concluded that the predicted noise levels at Justin Way did satisfy the NPPF Technical guidance limit criteria for the duration of the proposed development.

Victoria Place (Hill Tree Park)

8.6.63 Private dwellings at Victoria Place are situated at a position which was elevated above, and screened from, the existing Moorfield quarry stone crushing and screening area. The noise climate at the survey position was greatly influenced by noise from the existing crushing and screening activity, and was proposed to be continued throughout the development period. Predicted noise levels at this NSP location are therefore related to activity that already has planning permission, and is intended to be continued as at present.

8.6.64 Predicted noise levels at Victoria Place remained fairly constant throughout the eight phases of the proposed development, at a level between ranging between 50.9dB and 53dB, and appeared not to be significantly affected by noise from the proposed new Thewlis Lane Quarry development.

8.6.65 The predicted peak noise level at Victoria Place did not satisfy the "*no more than 10dB above background*" criteria, but did satisfy the 55dB maximum noise limit criteria for daytime activity.

8.6.66 It was therefore concluded that the predicted noise levels at Victoria Place satisfied the NPPF Technical guidance limit criteria for the duration of the proposed development.

Ballater Avenue

8.6.67 Ballater Avenue is located north of the proposed development at Thewlis Lane Quarry. During the noise survey period at the NSP, noise from Johnsons Wellfield saw shed was clearly audible. A free-field noise level measurement of noise from the saw shed activity was recorded at a fixed position near to the saw shed entrance.

8.6.68 The noise source was replicated in the SoundPlan model to assess the cumulative noise impact at the NSP.

8.6.69 The predicted noise level for Ballater Avenue included noise from the existing saw shed activity, various existing quarries at Crosland Moor, and the proposed Thewlis Lane Quarry development.

8.6.70 Noise levels at Ballater Avenue associated with typical operations (worst case) were predicted to peak at 51.7dB during phase eight of the proposed development (soil spreading). The predicted noise level did satisfy the "*no more than 10dB above background*" criteria.

8.6.71 The predicted peak noise level at Ballater Avenue during stone extraction at Thewlis Lane Quarry was 51.1dB during phase seven (extraction from cut T3 at Thewlis Lane Quarry). The predicted noise level did satisfy the "*no more than 10dB above background*" criteria.

8.6.72 The most significant noise impact at Ballater Avenue from the proposed development was during initial construction of the Thewlis Lane Quarry baffle mound in phase two. A peak noise level of 61dB was predicted at the NSP during baffle mound construction. Such work was considered as necessary, and temporary, to provide improved noise attenuation for the duration of the development. NPPF Technical

8.6.73 Guidance specifies an appropriate noise limit criteria of 70dB for such activity. The predicted noise level at Ballater Avenue during baffle mound construction therefore satisfied NPPF Technical Guidance criteria.

Sutherland Drive

8.6.74 Sutherland Drive is located east of the proposed Thewlis Lane Quarry development. During the noise survey period at the NSP, noise was clearly audible from the existing crushing and screening activity at Moorfield quarry. It was also noted during the noise survey period that the wind direction was from the south-west, and was the same direction as the stone crushing and screening activity.

8.6.75 Noise levels at Sutherland Drive associated with typical operations (worst case) were predicted to peak at 53.2dB during phase two of the development (extraction of block from cut T1 at Thewlis Lane Quarry). The predicted noise level did not satisfy the "*no more than 10dB above background*" criteria, but did satisfy the 55dB limit criteria for daytime quarrying activity.

8.6.76 It should be noted that during the initial excavation of block from cut T1 at Thewlis Lane Quarry, activity would be located at closest proximity to the NSP at Sutherland Drive. However, as the cut was excavated, the activity would move a further distance away from the NSP (therefore reducing activity noise levels at the NSP). Predicted noise levels at Sutherland Drive NSP during typical activity in cut T1 were 45.5dB which did satisfy the "*no more than 10dB above background*" criteria.

8.6.77 As was the case at Ballater Avenue, the most significant noise level predicted at Sutherland Drive was during the baffle mound construction at Thewlis Lane Quarry. A peak noise level of 60.9dB (table 4.6) was predicted during this period which satisfied the 70dB limit criteria for such activity.

Moor Park Avenue

8.6.78 Moor Park Avenue is located to the south of the proposed Thewlis Lane Quarry development. During the noise survey period at the NSP, noise was clearly audible from the existing stone crushing and screening activity at Moorfield Quarry. The wind was also from the same direction (south west).

8.6.79 Noise levels at Moor Park Avenue associated with typical operations (worst case) were predicted to peak at 50.9dB during phase seven of the proposed development (soil spreading at Thewlis Lane Quarry), and at 50.4dB (table 4.8) during phase three of the development (extraction of block from cut T2 at Thewlis Lane Quarry). The predicted peak noise levels did not satisfy the "*no more than 10dB above background*" criteria, but did satisfy the 55dB limit criteria for daytime quarrying activity.

8.6.80 Predicted peak noise levels at Moor Park Avenue during typical quarrying activity (i.e. located centrally and at mid-depth of excavation) were at 46.5dB during phase two, and peaked at 49.5dB during soil spreading at Thewlis Lane Quarry in phase eight. The predicted peak noise levels during typical activity did satisfy the "*no more than 10dB above background*" criteria.

8.6.81 As was the case at Ballater Avenue and Sutherland Drive, the most significant noise level predicted at Moor Park Avenue NSP was during baffle mound construction at Thewlis Lane Quarry during phase two of the development. A peak noise level of 62.4dB was predicted at Moor Park Avenue during the activity, which did satisfy the 70dB limit criteria for such activity.

Delves Wood Road

8.6.82 Delves Wood Road is located south west of the proposed development and south east of the existing Waterholes and Moorfield Quarries. During the noise survey period, noise from stone crushing and screening activity was audible to a lesser extent than at Sutherland Drive and Moor Park Avenue.

8.6.83 Noise levels at Delves Wood Road associated with typical operations (worst case) were predicted to peak at 45.2dB during phase seven of the proposed development (soil spreading at Thewlis Lane Quarry). The predicted noise level did satisfy the "*no more than 10dB above background*" criteria.

8.6.84 The predicted peak noise level at Delves Wood Road during typical activity at Thewlis Lane Quarry was 45.0dB during phase five (backfilling of cut T2 at Thewlis Lane Quarry, and shale storage at Waterholes Quarry). The predicted noise level did satisfy the "*no more than 10dB above background*" criteria.

8.6.85 As the NSP at Delves Wood Road was located a further distance away from the proposed Thewlis Lane Quarry development than Moor Park Avenue and Sutherland Drive, the noise impact was predicted to be less significant. It was concluded predicted noise levels at Delves Wood Road did satisfy the "*no more than 10dB" above background"* criteria for typical activity, and the 70dB limit criteria for temporary activity (such as baffle mound construction).

Conclusions

8.6.86 The noise assessment considered all noise sources associated with the proposed Thewlis Lane Quarry development, and included noise attributed to existing quarry activity at the various quarries collectively known as Crosland Moor. The noise assessment accounted for the following activities and related noise sources;

- Existing quarrying activity at Airfield and Waterholes Quarries.
- Saw shed activity located at the main existing building complex at Blackmoorfoot Road.
- Inert landfill activity at Waterholes Quarry.
- Above ground storage of overburden/shale activity at Airfield and Waterholes Quarries.
- Stone crushing and screening activities at Moorfield Quarry and the external storage area adjacent to Waterholes Quarry.
- Quarrying activity at the proposed Thewlis Lane Quarry development.
- Movement of dump trucks and HGV's associated with all identified activities.

8.6.87 Sound power level data used for plant and equipment in the noise assessment, included all fixed and mobile plant identified as being in current use, or proposed use, by the applicant at the proposed development. Inclusion of all identified plant and equipment noise sources in the assessment provided a robust and reliable noise assessment.

8.6.88 Noise prediction calculations were carried out in accordance with BS5228-1; 2009, using SoundPlan noise modelling software, and noise impact assessment criteria as referenced in the National Planning Policy Framework Technical Guidance. The noise impact assessment findings demonstrated the following;

i) Noise level predictions at Hadden Farm, Airfield Bungalow, Justin Way and Victoria Place were related to quarrying activity at Airfield and Moorfield Quarries for which planning permission has already been granted. The main change to the scheme at Airfield Quarry, would be the increased height of the overburden storage mound from the planning permitted 5m height to 10m height instead.

ii) Noise levels predictions confirmed that the NSP's to be most affected by noise from the proposed development are those located at Ballater Avenue, Sutherland Drive, Moor Park Avenue, and Delves Wood Road.

The predicted noise levels at these locations satisfied the NPPF Technical Guidance criteria for the duration of the proposed development.

iii) Noise generated by mobile and fixed plant would be no more than 10dB above the existing background noise levels criteria, as specified in the NPPF Technical Guidance, for the duration of the proposed development, at the following noise sensitive properties;

- Hadden Farm
- Justin Way (Hill Tree Park)
- Ballater Avenue
- Delves Wood Road

iv) Noise generated by mobile and fixed plant would be lower than the 55dB noise limit criteria, as specified in NPPF Technical Guidance, for the duration of the proposed development at the following noise sensitive properties;

- Airfield Bungalow
- Victoria Place (Hill Tree Park)
- Sutherland Drive
- Moor Park Avenue

v) Noise generated during temporary activity, essential for providing increased noise attenuation (i.e. baffle mound construction) was below the 70dB limit criteria as specified in the NPPF Technical Guidance at all noise sensitive properties for the duration of the proposed development.

8.6.89 In overall conclusion, the noise assessment finds that noise generated by the proposed development at Thewlis Lane Quarry satisfied the planning guidance noise limit criteria as specified in the NPPF Technical Guidance at all potential noise sensitive properties for the duration of the proposed development. In most circumstances the development met the "*no more than 10dB above background*" criteria during typical quarry activity, and would not result in a significant increase of noise levels above the existing noise climate.

8.7 TRAFFIC

Introduction

8.7.1 Silkstone Environmental Ltd commissioned Cannon Highways Ltd to prepare a Transport Statement to assess the impact of the proposals on the local highway network.

8.7.2 This section summarises the findings of the full report which can be found in Appendix 6 of the Technical Appendices.

8.7.3 Vehicular access to the proposed workings would be restricted to operational plant and vehicles, which would gain access via a new Heavy Plant Crossing in Thewlis Lane that would provide a connection with the existing quarry.

8.7.4 Other traffic would continue to utilise the existing access and parking arrangements already in use at the quarry.

8.7.5 The report demonstrates that the vehicular movements resulting from the proposed mineral workings are unlikely to compromise traffic flow or the safe operation of the local highway network.

8.7.6 The report also considers the traffic impact and transport sustainability provision associated with the proposed mineral extraction proposals and that the proposals should be acceptable for Planning Approval purposes.

Existing Highway Network

8.7.7 Thewlis Lane connects to Blackmoorfoot Road, which is a radial route emanating from Huddersfield in the east and extending in a south west direction (from the A62 Manchester Road) through the south/west suburban areas of the city towards the rural settlements in the hills to the south west of the city.

8.7.8 The junction of Thewlis Lane and Blackmoorfoot Road is a simple priority junction. Photographs showing the extent of the visibility available to the left and right along along Blackmoorfoot Road for drivers emerging from the Thewlis Lane are contained in Appendix B of the full report which can be found in Appendix 6 of the Technical Appendices.

8.7.9 The photographs show the visibility from a position set back approximately 2.4m from the edge of Blackmoorfoot Road along the centre line of Thewlis Lane. To the left of the junction the visibility for Quarries Ltd to the nearside of Blackmoorfoot Road for drivers of private cars is partially obscured by a stone boundary wall. Visibility for drivers of HGVs (who have a more elevated driving position) is less impaired.

8.7.10 Similarly, visibility to vehicles emerging from the junction (for traffic approaching from either direction in Blackmoorfoot Road) is less affected.

8.7.11 Thewlis Lane is a two way road, rural in character, subject to the national speed limit (60mph for private cars). It connects Blackmoorfoot Road, at it's northern terminus, with the B6108 Meltham Road, some 2.1km to the south. However, it's tortuous alignment and the narrow width of the road for much of it's length mean that it does not provide a practical or desirable route for through traffic. Predominantly, it's function is that of access to adjacent farmland and (from Blackmoorfoot Road) the existing Johnsons Wellfield Quarry.

8.7.12 Within the vicinity of the site, Thewlis Lane is unlit and has no pedestrian fooways.

Thewlis Lane

8.7.13 The access arrangements for the existing quarry are located within approximately 130m of the junction of Blackmoorfoot Road (the operational quarry, including the offices and workshops, are located to the west of the road and the parking and storage facilities are on the east side). Over this length, the carriageway is some 6.0m wide, lined with stone boundary walls and no verge or edge strip.

8.7.14 Beyond the existing quarry accesses the carriageway narrows to approximately 3.1m wide with grassed verges on each side (with stone boundary walls to the rear) and it is posted “Road ahead impassable for heavy goods vehicles”

Blackmoorfoot Road

8.7.15 Blackmoorfoot Road is a two way all purpose road connecting Huddersfield in the east (via the A62 Manchester Road) and the rural settlements located beyond the city boundary to the southwest. The road follows a typically east/west alignment offset to the south of the M62 Manchester Road corridor (the main principle east/west highway route to the west of Huddersfield).

8.7.16 To the east of Thewlis Lane, Blackmoorfoot Road has a predominantly urban character with development on both sides of the road. There are a number of business properties alongside the road immediately to the east of the junction of Thewlis Lane.

8.7.17 Beyond that, the road is lined with residential properties. There are pedestrian footways on both sides of the road, it is lit by a system of street lighting columns and is subject to a speed limit of 30mph. As it proceeds east from the junction of Thewlis Lane the road curves slightly to the left and falls to the east along an even gradient.

8.7.18 To the west of Thewlis Lane, Blackmoorfoot Road becomes increasingly rural in character. A single pedestrian footway continues on the north side. On the south side the footway terminates at Thewlis Lane. The carriageway, which measures some 7.0m to 8.0m in width (to the west of Thewlis Lane), follows a straight alignment climbing to the west along a constant gradient.

8.7.19 The system of street lighting continues along Blackmoorfoot Road to the west of Thewlis Lane.

8.7.20 Approximately 440m to the west of Thewlis Lane (approximately 40m to the west of the junction of Sand House Lane) the speed limit in Blackmoorfoot Road increases to 40mph.

Crosland Hill Road

8.7.21 Crosland Hill Road connects to Blackmoorfoot Road by means of a simple priority junction located some 30m to the east of the junction of Thewlis Lane and Blackmoorfoot Road. The junction of Blackmoorfoot Road and Crosland Hill Road incorporates a bus terminus with turning-circle arrangement on the east side of the junction. To the west of the junction the highway boundary has been set back to a splay to provide visibility along the main road.

8.7.22 To the east, visibility is provided across the bus turning-circle. Photographs showing the existing visibility at the junction are contained in Appendix B of the full report.

8.7.23 Crosland Hill Road is a residential road that connects Blackmoorfoot Road with A62 Manchester Road (some 1.2km, by road, to the north). The road is subject to a speed limit of 30mph and it is posted as "Unsuitable for Heavy Goods Vehicles". It has pedestrian footways on both sides of the road and it is lit by a system of street lighting columns.

Existing Traffic

8.7.24 It is understood that the existing local highway network functions satisfactorily well within it's operational capacity, inclusive of the existing traffic associated with the existing quarry.

8.7.25 Since the current proposals would not effect a change in the character or volume of traffic generated by the existing quarry operations, no further assessment or analysis of the existing traffic flows have been undertaken

Highway Safety

8.7.26 The records of injury accidents in the vicinity of the site during the period from 1 March 2007 to 29 February 2012 have been obtained from Kirklees Metropolitan Council. A plan showing the extent of the study area is contained in Appendix C of the full report. The study area includes the local highway network in the vicinity of the site including the junctions of Thewlis Lane/Blackmoorfoot Road and Blackmoorfoot Road/Crosland Hill Road.

8.7.27 The records show that during the assessment period a total of 3 accidents occurred in Backmoorfoot Road. One of these accidents is recorded as being "serious". The remaining two accidents are categories as "slight".

8.7.28 No accidents were recorded in Thewlis Lane or at the junction of Thewlis Lane/Blackmoorfoot Road.

8.7.29 None of the recorded accidents involved Heavy Goods Vehicles. A summary of the accidents is shown in the table below. Further details,

including the approximate location of the accidents is contained in Appendix C of the full report.

Table 1 – Accident Summary

Year	SEVERITY			INVOLVED		
	SLIGHT	SERIOUS	FATAL	PEDS	CYCLES	HGV's
2007	0	0	0	0	0	0
2008	0	0	0	0	0	0
2009	2	1	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0

8.7.30 There is nothing in the accident statistics that would indicate that there are currently any road safety issues in Thewlis Lane or in the local highway network in the vicinity of the site. Similarly, there is nothing to suggest that there are any highway safety issues relating to the existing quarrying operations in Thewlis Lane.

Development Proposals

8.7.31 Access to the proposed quarry workings would be via a new Heavy Plant Crossing to be constructed in Thewlis Lane. The proposed crossing would provide access for operational plant and vehicles only (all other traffic would continue to use the existing quarry access and parking facilities, as now).

Operational Details

8.7.32 While the proposals are for a new quarry, the workings would complement the existing quarrying and prestige building and construction stone production operations at the existing Johnsons Wellfield Quarry, which is located adjacent to the site, on the opposite side of Thewlis Lane. The proposed quarrying operations would be managed from the existing Wellfield Quarry facilities, which would also accommodate the storage of plant and provide welfare facilities.

8.7.33 Stone extracted from the proposed quarry would be transferred by vehicle to Wellfield Quarry for processing. Similarly, material used in the progressive restoration of the proposed quarry would be imported from the existing Wellfield Quarry site.

8.7.34 A new Heavy Plant Crossing is proposed in Thewlis Lane to accommodate the traffic movements between the two sites. The crossing would provide access for operational traffic only.

8.7.35 The proposed road crossing, which would incorporate appropriate strengthening of the existing highway pavement, is detailed on drawing number 10093/467.

8.7.36 The proposed operational working hours and shift patterns would be the same as those at the existing Wellfield Quarry. Similarly, the combined staff levels for the two quarries would remain as now.

8.7.37 Car parking for staff and visitors to the existing Wellfield Quarry are situated on land across Thewlis Lane opposite the main quarry buildings. The parking arrangements adequately accommodate the existing requirements and, since overall staff levels will be unchanged be the proposed development, Would continue to do so.

8.7.38 The combined output of the proposed and the existing quarrying operations would not exceed the current output from the existing Wellfield Quarry.

Trip Generation

8.7.39 Since the combined output from the proposed quarry and the existing Wellfield Quarry would not exceed the current output from the existing Wellfield Quarry, the proposals would generate no additional operational trips on the local highway network. Similarly, since the overall staff levels at the two quarries would remain as now, the proposals would generate not additional employee trips.

8.7.40 The proposals do, however, generate a number of plant movements across Thewlis Lane. The volume of traffic using the new Heavy Plant Crossing would vary depending upon operational need. However, the peak traffic movements during working hours are anticipated to be in the order of approximately 20 vehicles per hour.

Proposed Traffic

8.7.41 The proposed development would contribute no additional traffic to the existing highway network. Therefore the proposed traffic movements on the highway network would remain as now.

8.7.42 The transfer of plant and materials across Thewlis Lane between the proposed site and the existing Wellfield Quarry would generate crossing traffic but no additional trips on the highway network.

Traffic Impact

8.7.43 Since there would be no change in volume or character of traffic using the local highway network the development would have no impact in the context of traffic flow or operational capacity.

8.7.44 The proposed plant crossing in Thewlis Lane could disrupt traffic flow along Thewlis Lane. However, the relatively light traffic flows in Thewlis Lane and the likely frequency of plant crossing manoeuvres mean that the potential impact is unlikely to be significant.

Safety

8.7.45 Recent accident records show that there are no road safety issues in the vicinity of the site either generally or in the context of the existing mineral extraction operations in the area.

8.7.46 Since no change in the volume or character of traffic using the local highway network is anticipated as a consequence of the proposed extension to the existing quarry workings it is unlikely that the development would have any impact in the context of traffic safety.

Summary

8.7.47 The Transport Statement presents the existing traffic characteristics and infrastructure in the surrounding area of the development. The development proposals are then presented and the potential traffic impact of the proposals are assessed.

8.7.48 The development comprises an extension to the existing mineral extraction operations at Wellfield Quarry off Thewlis Lane. It would extend the existing operations into land on the east side of Thewlis lane (i.e. the opposite side of the road to the existing workings).

8.7.49 A Heavy Plant Crossing would be formed in Thewlis Lane to accommodate plant and vehicular movements between the existing quarry site and the new workings. Otherwise, access arrangements for the quarry would remain as now.

8.7.50 The new quarry workings would compliment the existing operations at Wellfield Quarry such that there would be no increase in the rate of output (i.e. the stone extraction from the new workings would balance the natural reduction in output from the existing workings which would continue to diminish as existing mineral deposits become exhausted). Furthermore, the operating hours at the quarry and levels of staffing would remain as at present. Therefore, there would be no increase in the level of traffic movements to/from the local highway network.

Conclusions

8.7.51 This section concludes that the proposed mineral extraction operations is acceptable in traffic impact terms and there are no highway safety or capacity reasons why planning consent for the proposed development should not be granted.

8.8 HYDROLOGY AND HYDROGEOLOGY

Introduction

8.8.1 Silkstone Environmental Ltd commissioned SM Foster Associates Ltd to prepare a Hydrogeological Risk Assessment to assess the impact of the proposals on the local groundwater.

8.8.2 This section summarises the findings of the full report which can be found in Appendix 7 of the Technical Appendices.

8.8.3 In preparing this assessment reference has been made to the Environment Agency Groundwater Protection: Policy and Practice (GP3) and policy related to discharge of surface water and groundwater to underground strata.

Hydrogeology

8.8.4 The site is located in the catchment of the River Holme which flows south to north approximately 750m to the east of the eastern site boundary. The River Colne flows west to east approximately 1200m north of the site before merging with the River Holme at Rashcliffe 2km downstream. There are no other permanent surface watercourses in the immediate vicinity of the site. However, topographic valleys to the immediate north and 500m to the south of the site suggest the potential for intermittent surface water drainage. Flood Estimation Handbook (FEH) catchment models for the area indicates the presence of watercourses along both valleys.

8.8.5 At the closest point to the Thewlis Lane site, the River Holme drains a catchment area of approximately 95km2 with a catchment average rainfall of 1,239mm/annum and a standard percentage runoff of 25.4%. The catchment is 65% urbanised.

8.8.6 Regional geological mapping of the area (BGS 1:50,000 sheet 77) indicates that the site is underlain by sandstones of the Rough Rock group which form part of the Millstone Grit Series. These measures consist of inter-bedded sandstones, siltstones and mudstones with a stratigraphic dip of between 2 and 5 degrees to the north and north east.. No faults have been identified within the site. The nearest fault is shown on published geological mapping to approximately 1km to the north east of the site.

8.8.7 Geological mapping indicates an absence of any superficial cover above the Rough Rock at the site and surrounding area. Exploratory drilling was undertaken at the site during 2000 to 2002. A total of nine cored boreholes were drilled and logged to determine local geology. Borehole logs confirm the presence of Rough Rock sandstones beneath the site with a basal elevation ranging from 172mAOD in the north east to 186mAOD in the south west. The Rough Rock is underlain by inter-bedded siltstones, sandstones and mudstones.

8.8.8 Available evidence indicates that the sandstones may have relatively high hydraulic continuity and capacity for drainage of infiltrating rainwater. Although there is no site specific rest groundwater level data, water strikes

in investigation boreholes were recorded during site investigation phases in 2000 and 2002. Available records indicate that groundwater was first encountered at depths of 16.10m-20.80m below ground level. Adjacent sandstone quarries in the area are understood to be permanently dry with no accumulation of groundwater.

8.8.9 Surface water catchment models (Flood Estimation Handbook) record an average percentage runoff of just 3.5% for surface water catchments immediately adjacent to the Thewlis Lane site. This percentage runoff is extremely low and reflects the high percentage infiltration to the sandstone strata and current/former quarry workings which constitute the majority of the catchment area.

8.8.10 The Rough Rock at Thewlis Lane is designated as a Secondary Aquifer with high vulnerability to contamination which reflects its free-draining nature. The site is not located in, or close to, any groundwater source protection zones.

8.8.11 During previous site investigation, groundwater was encountered in most exploration boreholes at a depth of approximately 175 -180mAOD.

8.8.12 Whilst groundwater strike data does not represent rest groundwater level it provides an indication that groundwater is present at relatively shallow depth within the Rough Rock, above the base of the proposed excavation.

8.8.13 Hydrological survey of the site and surrounding area confirms the presence of a small number of groundwater related features in the vicinity of the site. The inferred location of Butter Nab Spring 800m to the south and wells in the alluvial valley near Crosland Moor School 300m to the north are situated at an approximate elevation of 180 and 175mAOD respectively.

8.8.14 Evidence from adjacent stone quarries that have been excavated to greater depth than proposed for the Thewlis Lane site suggests that groundwater seepage tends to occur at relatively shallow depth where perched groundwater drains above a thin mudstone horizon. It is understood that at adjacent quarries, small volumes of perched groundwater drain intermittently into the site and drain freely through the base of the excavation to maintain dry working conditions.

8.8.15 Any groundwater present in the Rough Rock beneath the site would tend to drain down-dip towards the River Holme Valley in the east. However, the present of an existing quarry excavation to the immediate west may influence local groundwater flow directions.

Hydrogeological Impact Assessment

8.8.16 The proposed development will involve mineral excavation to an average depth of 24.9mbGL which is expected to be above the regional water table but below the elevation of perched groundwater in the upper horizons of the Rough Rock. The development therefore has the potential to affect local groundwater conditions.

8.8.17 Mineral excavation will create a topographic depression into which all incident rainfall will drain to the underlying strata. Hydrological assessment

has demonstrated that, at present, a high percentage of rainfall infiltrates underground strata with low percentage runoff. The presence of the mineral workings is therefore unlikely to have significant impact on the total volume of recharge to underground strata. There would however, be a change in the timing and rate of recharge as temporary removal of a proportion of the unsaturated zone would reduce recharge attenuation.

8.8.18 With an estimated excavation area of up to 4.7ha, an annual average rainfall of 1,239mm and estimated evapotranspirative losses of around 50% the average daily effective rainfall across the excavation area is likely to be approximately 80m3/day. Minor variation in the rate and timing of recharge at this rate is unlikely to have any significant impact on groundwater flow or local groundwater levels.

8.8.19 Once encountered towards the base of the proposed excavation, perched groundwater in the Rough Rock would drain into the excavation and discharge to underlying strata. Evidence from adjacent quarries indicates that the volume of perched groundwater is low and that any water entering the excavation can drain freely through the excavation base without on-site accumulation.

8.8.20 Rainfall recharge that would contribute to perched groundwater over the excavation area is quantified above. The excavation would create the potential for perched groundwater from outside the excavation area to drain into the site. However, both stratigraphic and topographic dip is to the north and north east and existing mineral workings are present to the west. As a consequence there is limited potential for groundwater drainage from the surrounding area to enter the site. It is therefore concluded that the proposed development is unlikely to have any adverse impact on groundwater levels or flows outside the site boundary.

8.8.21 The surface water management plan for the site will involve discharge of surface water from peripheral screening bunds into the excavation area for drainage through the base of the workings. As a high percentage of incident rainfall currently infiltrates the same strata there is unlikely to be any significant change in rainfall recharge characteristics as a consequence of this approach.

8.8.22 Removal of unsaturated sandstone will reduce the pathway length to deeper groundwater systems below the base of the proposed excavation. The high infiltration capacity of the sandstone contributes to its classification as highly vulnerable to contamination. The proposed development will therefore temporarily increase the risk of groundwater contamination by reduction in unsaturated zone attenuation capacity.

8.8.23 Mineral extraction will involve the removal of natural materials and transportation off-site. There will be no on-site processing. The greatest risk to groundwater quality will arise in relation to the use of mobile plant within the excavation area and any risk of accidental hydrocarbon spillage. No other potential contaminants are likely to be present within the workings.

8.8.24 During the exploratory drilling programme in 2000/2002 boreholes were extended several metres below the base of the Rough Rock and hence below the base of the proposed excavation. There is no evidence to suggest

that groundwater was encountered at depth in any of these boreholes. It is noted that the River Holme to the east flows at an elevation of approximately 75mAOD, which is approximately 100m below the proposed base of excavation, at a distance of 700m from the site boundary.

8.8.25 Available evidence therefore suggests that a significant thickness of unsaturated Millstone Grit is present beneath the proposed excavation base and that any local pollution event within the workings is unlikely to have any significant impact on local groundwater resources. It is, however, anticipated that standard pollution prevention measures will be incorporated into site operations to ensure that any risk of hydrocarbon contamination of underground strata is minimised.

8.8.26 Following completion of mineral excavation and restoration of the site with mineral overburden it is anticipated that groundwater recharge and drainage characteristics will be comparable to conditions at the site prior to development. There is no evidence to indicate that the proposed development would lead to any significant permanent or long term change in local groundwater resources or risk to groundwater quality.

Summary and Conclusions

8.8.27 It is concluded that the proposed mineral excavation will remain well above the regional groundwater level but will intercept shallower perched groundwater at a depth of 16.0 to 20.0mbGL.

8.8.28 Available evidence suggests that surface water and groundwater draining into the excavation will drain freely through the quarry floor to underground strata with no significant impact on local groundwater levels or groundwater flow. There will be no requirement for removal of groundwater or surface water from the site.

8.8.29 Removal of unsaturated sandstone may increase the vulnerability of deeper groundwater systems to contamination from site operations. However, due to the expected presence of a considerable thickness of strata between the base of the quarry and the regional groundwater elevation it is concluded that, subject to the implementation of appropriate pollution control measures, the risk to groundwater quality is likely to be negligible.

8.8.30 It is concluded that the proposed development does not represent a significant risk to groundwater resources and that, subject to the implementation of appropriate pollution control measures, no other mitigation measures are required or proposed.

8.9 FLOOD RISK ASSESSMENT

Introduction

8.9.1 Silkstone Environmental Ltd commissioned SM Foster Associates Ltd to prepare a Flood Risk Assessment to assess the potential for flood risk as a result of the proposals.

8.9.2 This section summarises the findings of the full report which can be found in Appendix 7 of the Technical Appendices.

8.9.3 The flood risk assessment (FRA) is prepared in accordance with the requirements of the National Planning Policy Framework (NPPF). As the site is situated in Flood Zone 1 the FRA is primarily focused on assessment of surface water management requirements and measures required to ensure that the proposed development does not result in increased flood risk in the surrounding area.

8.9.4 According to the current Environment Agency flood zone map of the area the site is situated in Flood Zone 1 and is therefore at low risk of fluvial flooding.

8.9.5 However, as the site extends to an area considerably in excess of 1ha a flood risk assessment dealing with surface water management is required in order to comply with the NPPF.

8.9.6 Environment Agency standing advice on flood risk assessment provides details of the issues to be considered in relation to development in Flood Zone 1. With regard to flood risk, the primary considerations related to proposed development are (i) to ensure that the development itself is not at risk of flooding from non-fluvial sources e.g. internal drainage, groundwater etc. and (ii) to ensure that the proposed development does not increase flood risk elsewhere. The nearest high flood risk area is along the River Holme valley approximately 750m to the east of the site.

8.9.7 This study has been based on a detailed review of existing hydrological information and new hydrological analysis. More specifically the study has incorporated the results of:

- Local hydrological survey
- Desk based flood hazard review
- FEH rainfall runoff analysis
- Surface water drainage mechanism review

8.9.8 The study has also included provisional review of surface water management options in relation to the principles of sustainable drainage systems (SUDS).

8.9.9 Site specific evidence of local surface water drainage characteristics has been derived from evaluation of the drainage characteristics of adjacent mineral workings which are developed through the same geological strata to be excavated at the Thewlis lane site. It is understood that all local stone

quarry excavations have remained above any local groundwater elevation and consequently remained free-draining.

8.9.10 The proposed development has been designed to ensure that there will be no increase in the rate of surface water discharged from the site.

8.9.11 The use of infiltration mechanisms wherever possible comply fully with the general principles of SUDS (Sustainable drainage systems) and the development of a sustainable drainage regime for the site.

Hydrological setting

8.9.12 At present, surface water drainage from the site tends to infiltrate thin superficial cover and percolate into the underlying permeable sandstones with no significant generation of surface runoff.

8.9.13 The Institute of Hydrology Flood Estimation Handbook (FEH) software allows calculation of peak rainfall intensity for a range of rainfall durations and frequencies. Surface water drainage design is often undertaken in relation to the 6 hour 1 in 30 years and 1 in 100 years rainfall events although lower frequencies may be relevant to more vulnerable types of development. A summary of calculated rainfall intensities for the drainage catchments, including the site area, is provided in Table 1.

Table 1: Rainfall duration – frequency relationships (6hr duration)

Storm frequency (years)	Rainfall intensity (mm)`	Rainfall intensity (mm/hr)
1	23.7	3.95
30	57.1	9.52
100	78.3	13.05

8.9.14 NPPF requires that for flood risk assessment the effects of climate change need to be incorporated into rainfall runoff calculations. Current government guidance regarding climate change allowances indicates that an increase of 5% should be included to 2025 increasing to 10% between 2026 and 2055 and 20% to 2085. Increase in rainfall intensity beyond 2085 is currently estimated to be 30%. It is considered that for the proposed development it is appropriate to incorporate an average climate change allowance of 5%.

Flood risk assessment

8.9.15 As discussed, the site is located in Flood Zone 1 outside the limit of high or moderate fluvial flood risk. With regard to development and flood risk, the NPPF states that ‘all uses of land are appropriate in this zone’.

8.9.16 In relation to flood risk vulnerability the proposed development can be defined as mineral workings and therefore classified as ‘less vulnerable’ in relation to the definitions included in the NPPF. For all types of development that exceed 1ha in Flood Zone 1 a flood risk assessment is required to support planning permission for new development. NPPF confirms that the FRA should focus on consideration of vulnerability to other sources of

flooding and the potential to increase flood risk elsewhere due to hard surfaces and the effect of new development on surface runoff.

8.9.17 With regard to spatial planning policy and the Sequential Test the proposed development is to be located in an area of lowest flood risk. This is consistent with the objectives of the NPPF and Local Planning Authority policy. As confirmed by reference to Table 3 of the NPPF Technical Guidance document, the proposed development therefore passes the Sequential Test and there is no requirement to undertake the Exception Test.

Flood mechanisms

8.9.18 Environment Agency flood zone maps indicate that the site is not at risk of fluvial flooding in response to either the 1 in 100 year or 1 in 1000 year flood events in any local surface watercourses. NPPF suggests that consideration should be given to site vulnerability to other potential sources of flooding including:

- Flooding from groundwater
- Flooding via overland flow from adjacent land
- Flooding from surface water drainage

8.9.19 It is understood that the site is underlain by sandstones of the Rough Rock group which form part of the Millstone Grit Series. Available evidence indicates that the sandstones may have relatively high hydraulic continuity and capacity for drainage of infiltrating rainwater. Although there is no site specific groundwater level data, water strikes in investigation boreholes were recorded during site investigation phases in 2000 and 2002. Available records indicate that groundwater was first encountered at depths of 16.10m-20.80m below ground level. Adjacent sandstone quarries in the area are understood to be permanently dry with no accumulation of groundwater. Local hydrogeological conditions therefore indicate that the site is unlikely to be at risk of flooding from groundwater

8.9.20 Ground levels at the site fall from Thewlis Lane in the west towards residential development in the east. Quarry excavations are present to the immediate west of Thewlis Lane. Surface water runoff along Thewlis Lane will drain to the local road drainage system. Land to the immediate north of the site drains northwards towards the steep sided valley and intermittent drainage route. To the south ground levels fall away from the site with surface runoff tending to drain towards stormwater sewers in residential development areas. It is therefore concluded that there is limited potential for drainage onto the site from surrounding land and therefore no significant risk of flooding from overland flow.

8.9.21 The site drainage system is designed to ensure that the site is not at risk of surface water flooding, or results in an increase in flood risk elsewhere, in response to rainfall events up to 1 in 100 year's magnitude.

Surface water management

8.9.22 In addition to the requirement to consider flood risk to the proposed development it is also necessary to consider the implications of development on flood risk in the surrounding area. Comparative analysis of changes in the drainage regime that might result from the proposed development is based on evaluation of the existing drainage system and assessment of the potential changes that would result from the proposed scheme.

8.9.23 Long term evidence from adjacent stone quarries indicates that the proposed base of excavations will remain well above any local water table and that any water present within the site will drain naturally by infiltration into underlying strata. It is therefore proposed that all surface water generated on the site will be managed within the site and that there will be no off-site discharge. In that context the proposed development may lead to a reduction in the rate and volume of surface water draining from the site when compared to its current state.

Greenfield drainage rates

8.9.24 The calculated peak greenfield runoff rate for the 1 in 100 year event equates to an average rate of approximately 0.7 l/sec/ha which is extremely low but consistent with the high infiltration capacity of the site and surrounding area.

Development runoff rates

8.9.25 The proposed development will incorporate a number of features that will influence the surface water generation and runoff rate as follows:

- Development of a large excavation that will contain incident rainfall and runoff from access road and inward faces of screening bunds.
- Installation of a perimeter drainage system around the external boundary of the screening bund that will be designed to discharge to the excavation void in a controlled manner.

8.9.26 To ensure that direct comparison can be undertaken, calculation of post development peak runoff rates has been based on the same assumptions and principles as the calculation of Greenfield runoff rates. The following approach has been adopted:

- All rainfall over the excavation area will be collected in the excavation area and allowed to soakaway through the base of the excavation
- Runoff from peripheral bunds could occur at a rate of up to 60% of incident rainfall (this is considered to be conservative)

8.9.27 Surface water will be managed at two locations: (i) at the point of entry to the excavation from the peripheral screening bund drain, and (ii) through the based of the excavation.

8.9.28 As all surface water generated from the site will be contained within the site and allowed to infiltrate to underground strata there will be a small net

reduction in the volume and rate of off-site surface water discharge when compared to the current greenfield situation. It is apparent therefore that the proposed development will have no adverse on downstream flood risk although the volume of runoff reduction is likely to be too small to have any significant beneficial impact.

8.9.29 The proposed site surface water management system will incorporate a drainage ditch around the inside and the outside of the peripheral screening bund. The ditch and the internal discharge system will be designed to accommodate runoff from a 1 in 30 year storm event. Within the excavation, surface water will tend to drain naturally to the lowest point and soakaway to underlying strata. No other formal surface water management systems are proposed.

8.9.30 It is understood that the site will be restored to its existing profile on completion of excavation. The materials to be used to restore the site are in-situ overburden and soils that will retain the same hydraulic properties as at present. There is no basis to conclude that, following site restoration, there would be any change in greenfield runoff rates when compared to the site in its current form.

8.9.31 The use of systems designed to promote stormwater infiltration in the excavation void are consistent with the general principles of SUDS (Sustainable Drainage Systems) as promoted by the Environment Agency and the Local Authority.

Summary and conclusions

8.9.32 The site is located in Flood Zone 1 and therefore at low risk of fluvial flooding. It has been demonstrated that the site is not at risk of flooding from groundwater sources or overland flow from adjacent land.

8.9.33 Proposals to manage surface water on-site will result in a minor net reduction in off site surface water discharge when compared to the current condition of the site. In that context the proposed development would have no adverse impact on local flood risk and could make a positive contribution towards reduction of flood risk in the River Holme downstream.

8.9.34 The proposed development will make maximum use of permeable surfacing and on-site attenuation to minimise runoff and promote infiltration. The development therefore fully incorporates the principles of SUDS (Sustainable Drainage Systems).

9.0 ARCHAEOLOGY

9.1 Introduction

9.1.1 Archaeological Services WYAS (ASWYAS) was commissioned by Silkstone Environmental Ltd to undertake an archaeological desk-based assessment of land at Thewlis Lane Farm, Crosland Moor, Huddersfield, Kirklees to inform a planning proposal for sandstone extraction on the site.

9.1.2 This assessment was undertaken to meet the requirements of a specification of work provided by the West Yorkshire Archaeology Advisory Service

9.2 Methodology and Sources

9.2.1 The following sources of information have been consulted in order to meet the requirements of the desk-based assessment, and are in line with the guidelines laid down by the Institute for Archaeologists for such work (IfA 2008).

- Archaeological records and archives
  Information on previous archaeological finds within the study area was obtained from the West Yorkshire Historic Environment Record (HER). Kirklees Archives and Local Studies Library were consulted for historical maps and plans and other relevant documentary sources, which are listed in the bibliography.

- Published and unpublished documentary sources
  A range of published and unpublished material has been researched and consulted, including holdings from the Yorkshire Archaeology Society library, Leeds. These include academic articles, together with general sources on the area and its wider archaeological and historical background, which are listed in the bibliography.

- Geological and soil surveys
  Information on the underlying geology and soils within the study area was taken from data collected by the Institute of Geological Sciences (now the British Geological Survey) (IGS 1969) and the Soil Survey of England and Wales (1980).

- Aerial photographs
  A search was undertaken of the English Heritage NMR for historical vertical and oblique aerial photographic coverage of the proposed development site.

- Walkover survey
  A walkover survey was undertaken on the 16th of February 2012 in order to assess the survival of previously recorded and documented features, to identify any further archaeological sites visible on the ground and to determine the potential for any future archaeological investigations.

9.3 The Study Area

9.3.1 A total of ten archaeological sites or historical buildings have been identified within the study area. These sites are discussed below and have been catalogued in Section 4. No features were identified surviving as crop or soilmarks on aerial photographs of the proposed development site.

9.3.2 The study area contains no designated Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields or Conservation Areas. The study area contains seven Listed Buildings, one of which (**D**; LB no. 417428) is located within the proposed development site.

The Early Prehistoric period

9.3.3 The earliest human activity within the Pennines probably followed the retreat of the ice sheets around 10,000 BC, as small Nomadic groups moved north with the improving climate.

9.3.4 Such Palaeolithic groups appear to have utilised caves and natural outcrops as shelter and bases for hunting. However, evidence of Palaeolithic activity is scarce and largely restricted to cave sites, and no remains of this date have been found in the study area.

9.3.5 The post-glacial landscape would have largely comprised treeless tundra, but by the early Mesolithic period, about 7600 BC, this gave way to woodland as the climate improved. Such environmental change improved the potential for human activity, as the spread of the woodland lead to an increase in animal and plant resources. Recent research on Marsden Moor, approximately 6km to the south-west of the study area has produced evidence of extensive activity during the Mesolithic period in the form of numerous flint assemblages. These may represent camps and sites chosen as workshops for groups hunting across this area (Spikins 1999, 13). No archaeological evidence of Mesolithic date has been recorded within the study area.

9.3.6 The development of agriculture led to a more sedentary lifestyle in the Neolithic period (*c*. 3500-2000 BC) and evidence for occupation at this time has been identified at Castle Hill, Almondbury, 3km to the east (Keighley 1981, 91). Neolithic flints have been found throughout the Pennines (Keighley 1981, 91), and an early Neolithic polished flint axe (**3**) was discovered by The Friends of Beaumont Park, 450m to the south-east of the site during gardening activities in early 2007. The axe, which has a highly polished lustrous finish, appears to originate from a flint source on the east coast of England. The axe is almost totally complete, with the exception of a post-depositional removal on the hafting end (Pollard 1988).

The Bronze Age and Iron Age (*c*. 2000 BC-AD 43)

9.3.7 Evidence for Bronze Age cairns in the Holmfirth and Honley areas suggest settlement activity during this period, although many such cairns have been destroyed by quarrying (Keighley 1981, 108). There is no definite evidence for later prehistoric activity within the study area, although two enclosures were recorded in the area to the south of the proposed development area in

1775, one measuring 70m by 59m and another 90m by 80m (Watson 1775, 275). One of these (**2**) is depicted as an oval earthwork marked as 'Camp'on the First Edition Ordnance Survey map of 1854 (see Fig. 5), and it is unclear whether these earthworks formed two concentric enclosures or were two separate features that appeared as one enclosure by this time (Keighley 1981, 127). This enclosure had apparently been largely destroyed by the early 1920s (Petch 1924). This may be associated with a number of earth banks identified to the east, but from their description these appear to have represented medieval agricultural features (**1**).

9.3.8 The hillfort at Castle Hill, Almondbury, approximately 3km east of the proposed development site is also clearly visible from the proposed development site, and provides the closest extant evidence for Iron Age settlement in the area.

The Roman period (*c.* AD 43-410)

9.3.9 There is no evidence for Roman settlement within the study area although the occupation of the possible Iron Age enclosure recorded to the south of the site could have continued in use through into the Roman period. Evidence for Roman tile production has been found at Grimescar near Huddersfield, 4km to the south of the study area, which supplied the tiles for the fort at Slack, to the north-west of Huddersfield, as well as the fort at Castleshaw 15km to the south-west (Faull 1981a, 149).

Anglo-Saxon and Medieval period (*c.* 410-*c.*1550)

9.3.10 At the end of the Roman period, the kingdom of Elmet was established in West Yorkshire and reached the height of its power in the 6th century (Faull 1981b, 171). By the early 7th century the area became part of the kingdom of Northumbria until the 9th century when it fell under Viking rule (Faull 1981b, 179). No archaeological sites or finds dating to this period have been identified within the study area.

9.3.11 Crosland is listed as two separate entries in the Domesday Book of 1086 *Croisland* (South Crosland), which later became part of the Honour of Pontefract, and *Northcrosslande*, which fell within the Manor of Wakefield (Williams and Martin, 2003; Michelmore 1981). The 'Crosland' element suggests the presence of a medieval cross in the area (Smith 1961, 265).

9.3.12 The name *Croslandfosse* was also used to distinguish *Crosland* from *North Crosland*, and it has been suggested that this *fosse* element may relate to the earthworks of the enclosure recorded to the south of the proposed development site and marked on the First Edition Ordnance Survey map of 1854. By the early 13th century the proposed development area lay within the township of Lockwood, which was subdivided into the hamlets of *North Crosland* and *Crosland Half* (Michelmore 1981).

9.3.13 The only possible medieval features recorded in the study area consist of a number of associated earthworks, including a 20m long bank, a rectangular platform measuring 10m by 10m and a series of north-south aligned ridges. These seem likely to have been the remains of medieval ridge and furrow, but the area has now been built over.

Post-medieval and modern periods

9.3.14 The field pattern within the proposed development site appears to be the result of the 19th century enclosure of Crosland Moor. Indeed, although this area is covered by both the Crosland Enclosure Map of 1803 and the Crosland Tithe Map of 1847, neither map depicts the fields which now divide the site, or show Thewlis Lane Farm (see Figs 3 and 4; North Crosland Enclosure Map 1803; South Crosland Tithe Map 1847). The earliest map source showing the proposed development site is the First Edition Ordnance Survey 6 inch map, surveyed between 1849 and 1851 (Ordnance Survey 1854). This shows the field system much as it exists today, with the farm at this time being named as 'Barley Misery'.

9.3.15 The farm buildings themselves appear to have consisted of a farmhouse and possible adjoining barn, together with another smaller building to the east. The sites of an associated pump and well are also marked on the First Edition map. By the time of the publication of the 1892 Ordnance Survey 25 inch map a number of additional farm buildings appear to have been added to the east of the house, and a small orchard established to its south-east (see Fig. 6). This arrangement of buildings continued in use until the farm was abandoned in the second half of the 20th century (see Figs 7, 8 and 9). The buildings on the site are shown clearly on an undated plan, which may date to the 1930s (see Fig. 10). This shows that the main building range consisted of a two storey farmhouse, with an adjoining barn and cattle sheds to the north-east, comprising a main barn and mistal, and adjacent dairy and wash house areas. A narrow building range to the south-east included a cart shed, chicken and pig pens and a large store. A Dutch barn was also situated to the north-east. Despite the farmhouse being a Grade II Listed Building (LB no. 417428) it, and its associated buildings, are now in a ruinous state, with the walls surviving to little over a metre in height.

9.3.16 The surrounding area, particularly to the east of the proposed development site, has been developed for housing from the 1930s onwards (see Fig. 9). Sandstone quarrying has also been an important industry in the local area since at least the industrial revolution, and numerous small quarries are marked on the First Edition Ordnance Survey 6 inch map of 1854 in the area surrounding the proposed development site (see Fig. 5). Larger quarries were developed to the north-west and west of the site from the early 20th century, leading to the large-scale quarrying at the Waterholes Quarry to the site's immediate west.

Catalogue of Archaeological Sites and Buildings

9.3.17 Catalogue entries have been ordered geographically from west to east, and given a numerical identifier. The catalogue entry includes a National Grid Reference (NGR) number. Where an archaeological feature has an associated 'PRN' number the information has been obtained from the West Yorkshire HER. All further information is referenced in the bibliography.

9.4 Archaeological sites and findspots

i) Earthworks - Earthworks of an uncertain date have been recorded approximately 250m to the south of the southern edge of the proposed development site. These apparently comprised a 20m long bank, a

rectangular platform measuring 10m by 20m, and a number of north-south aligned ridges, which may have been the remains of medieval ridge and furrow ploughing.

ii) Enclosure - Two enclosures were recorded in 1775 on Crosland Moor, one measuring 70m by 59m and another measuring 90m by 80m (Watson 1775, 275), approximately 300m to the south of the proposed development site. One of these enclosures is depicted as an oval earthwork marked as 'Camp' on the First Edition Ordnance Survey map of 1854. By 1924, it was reported that the site was 'almost obliterated' (Petch 1924). A housing estate, called Beaumont Park, now covers the area.

iii) Flint Axe - An early Neolithic polished flint axe, dating to *c.*3500 BC, was discovered by 'The Friends of Beaumont Park' during gardening work in early 2007. The axe, which has a highly polished lustrous finish appears to be of a flint from a source on the east coast of England. The axe is almost totally complete, with the exception of a post-depositional removal on the hafting end.

The axe is 152mm long and 62mm wide at the head of the axe and 39mm at its butt, and weighs 338 grams. It was recorded by the Portable Antiquities Scheme Finds Liaison Officer (ref. SWYOR-328703).

9.5 Listed Buildings

9.5.1 Listed Building catalogue entries have been ordered geographically from west to east, and given an alphabetical identifier, with the locations shown on Figure 2. The catalogue entry includes a National Grid Reference (NGR) and a Listed Building (LB) number.

i) 41 and 43 Crosland Hill Road LB no. 339742 - Two early 19th-century two storey cottages, situated 450m to the north-west of the proposed development site, constructed in a hammer-dressed stone with pitched slate roof. These buildings are Grade II Listed.

ii) Crossland Hall Cottage LB no. 339742 - An early 19th-century two storey, stone built house with pitched slate roof, situated 375m to the north-west of the proposed development site. This building is Grade II Listed.

iii) Farm Buildings at Crosland Hall LB no. 339743 - A range of buildings of a probable early 19th-century date, situated 400m to the north-west of the proposed development site. This consists of a two storey barn and a stone built house with pitched stone slate roof, with a single storey extension to the south. These buildings are Grade II Listed.

iv) Thewlis Lane Farmhouse LB no. 417428 - The now ruinous remains of Thewlis Lane Farmhouse were Listed Grade II in 1978. At this time it was described as an early 19th-century, two storey, hammer-dressed stone built house with pitched slate roof, and one coped gable end. A range of three-light stone mullioned windows and one two-light stone mullioned window are recorded on the first floor. A barn was also

recorded at the east end of the house, with segment-headed planked doors, and a two storey lean-to extension with a catslide roof. The site is now derelict, with only three-four courses of stonework visible in most places. This building is Grade II Listed.

v) Dryclough Farmhouse LBS 339789 - A range of buildings of a probable or earlier 19th century date, situated 425m to the northeast of the proposed development site. This consists of a farm house with a barn and cart shed, with a two storey barn to the west and a one storey cart shed to the east. This building is Grade II Listed.

vi) The Lodge LBS 479434 - Park Lodge, situated 350m to the south-east of the proposed development site, was built in 1883, with 20th century additions. It is constructed of course rubble stone with ashlar dressings, with a Westmorland slate roof. This building is Grade II Listed.

vii) Woodfield House LBS 401320 - An early 19th century, two storey, ashlar built house with a hipped slate roof, situated 480m to the south-east of the proposed development site. This building is Grade II Listed.

9.6 Conclusions

9.6.1 Although there is no recorded evidence for prehistoric activity within the proposed development site, there is extensive evidence for activity of a Mesolithic and Neolithic date across the south Pennines. Indeed, the discovery of a Neolithic polished axe head to the south-east of the proposed development site suggests that there has been activity in the immediate area since at least this time. The recorded, but now destroyed, earthwork enclosures which were situated to the south of the site also suggest possible later prehistoric activity, possibly dating to the Bronze Age or Iron Age. It is possible that late prehistoric settlement could also have continued on earlier sites through into the Roman period.

9.6.2 The proposed development site is likely to have remained largely as marginal moorland until the enclosure and improvement of the area during the first half of the 19th century, when it was sub-divided into its regular field pattern and the farm buildings constructed. The farm was primarily used for dairy farming, and the lack of modern or post-medieval ploughing across the site may have helped preserve any potential earlier sub-surface remains.

9.6.3 Therefore, there is potential for the survival of previously unrecorded prehistoric or Roman period sub-surface remains within the proposed development site. Evidence for medieval activity, or unknown post-medieval sites, is likely to be associated with agricultural use, such as drainage or former field boundaries. Further archaeological investigations may be required to determine the nature and extent of any potential unrecorded sub-surface remains within the proposed development site. These could possibly include a programme of geophysical survey, if the ground conditions, geology and soils are suitable, a watching brief or evaluation excavation. Any such work should form part of an overall archaeological strategy to be agreed with WYAAS.

9.6.4 Despite the farmhouse at the centre of the site being a Grade II Listed Building, this is now in a derelict and ruinous state, and is not recognisable as a standing structure as it was when it was designated in 1978. However, English Heritage should be informed before any development work is undertaken which may further impact upon the condition of the building's remains,

10.0 RESTORATION

10.1 Introduction

10.1.1 This section describes the Restoration and Aftercare proposals for the site, in particular the treatment and measures to be taken to restore the land, on completion of quarrying operations to a sustainable and beneficial after use. The full report prepared by CB Land Consultancy Ltd is contained in Appendix 10 of the Technical Appendices.

10.1.2 It also addresses the strategic framework for the creation of tree planting areas both in advance of the quarrying, during the aftercare period and those areas to be returned to agricultural use, their management and the maintenance principles required to achieve this objective.

10.1.3 The key elements are: -

- The creation of an attractive landscaped setting.
- The integration of new planting with the surrounding landscape.
- An increased diversity of landscape and visual appearance through the provision of additional trees and new hedge planting.
- The creation of sustainable planting areas with diverse ecological habitats.
- The creation of agricultural grassland of no less a quality than exists at present.

10.1.4 In line with the existing landform and that to be created, the restoration and aftercare proposals will provide cover, food source, light, shade and diversity of aspect. The long-term management regime will maximise the sustainability of the reinstated features.

10.2 Soils

Soil Resource

10.2.1 A comprehensive Soils Report accompanies the planning application and is included in Appendix 3 of the Technical Appendices, which has identified the soil resources as sub-grade 3a and 3b classed as per the guidelines for agricultural land classification. The Soils Report identifies the site as having on average a topsoil profile depth of 40 cm with varying depths of subsoil over lying sandstone of between, 20–25 cm in depth.

Soil Stripping

10.2.2 All soils shall be stripped from the working areas and shall be stored like on like, with any areas on which overburden are to be stored stripped of all soil, this will ensure that the intermixing and loss of the soil resource does not occur.

10.2.3 The stripping of soils will be carried out using 360^0 excavators, loaded into dump trucks and transported to the soil storage areas where they will be place into mounds and graded with a tracked excavator to minimise

compaction to form baffle banks and mounds in the position shown on the site-working plan accompanying the application. In carrying out this operation defined haul roads shall be used to minimise the areas compacted whist this operation is in progress, traversing of the soil type being stripped shall be kept to an absolute minimum at all times.

10.2.4 It is important that soils shall only be traversed and stripped when their plastic limit is such as to minimise the effect of disturbing the soils. Soils stored under the correct conditions are less likely to deteriorate and develop anaerobic conditions whilst stored. Through adhering to the code of practice for the stripping of soils through traversing and stripping when they are sufficiently dry will greatly assist the soils reinstatement under the optimum conditions.

Soil Storage

10.2.5 The location of the soil storage areas have been designed and are located in positions which afford screening to the site and will not involve double handling, hence the majority of the storage areas will be located on the periphery to the site.

Soil Mounds

10.2.6 On completion of the soil stripping, placing into storage and the grading of the storage mounds, the soil stored shall be seeded with a low maintenance grass seeds mixture. This will prevent:

- wind blow of soils as the surface dries
- reduce water erosion
- maintain biological activity
- reduce the growth of invasive weeds that inevitably establish on bare soil
- provide a neat and tidy appearance to the stored soil and provides screening to the site.

10.3 Restoration Proposals

10.3.1 The site will be reinstated to a landform with contours similar to those existing at present, as detailed on phasing plans accompanying the planning application. The landform will be created through the re-grading of material termed as overburden to the approved contours, which shall form the overburden layer. Sub and topsoil shall be re-spread uniformly to a thickness that will complete the reinstated soil profile. Prior to removing soils from their storage mounds, vegetation growing on the mounds shall be sprayed off with an appropriate herbicide to prevent the spreading of weeds throughout the restored areas and reduce vegetation which might create anaerobic conditions within the restored soil profile.

10.3.2 During the quarrying operation if suitable material is identified at depth as having qualities classed as soil making material, being of better quality than the overburden material then these shall be conserved and stored to be utilised as the final layer of overburden material, that in the longer term would create a greater depth to the soil profile.

10.3.3 The back filling of the site shall commence on completion of the quarrying operation. The replacement of soils to areas restored to the agreed contours shall be worked in areas capable of completion having regard to the weather conditions prevailing at the time. If too large an area is prepared to receive subsequent layers of soils which become saturated this will delay the re-spreading operations as the profile will need to dry out before re-spreading can recommence, in addition to which additional trafficking in carrying out re ripping will be detrimental to the soil structure. Due to the scale of the operation it is intended to complete re-grading operations prior to commencing the reinstatement of soils and aftercare works. On completion of back filling to the agreed contours all internal haul roads, items of plant and equipment not required during the restoration operation will have been removed from site.

10.3.4 It is unavoidable that during the reinstatement of overburden in creating the final landform onto which soils will be spread, through traversing with plant necessary in completing this task that compaction will occur. Prior to the reinstatement of the subsequent layers of soil it is imperative that loosening of the final layer of overburden to a depth of at least 300mm is undertaken with a wing tyne subsoiler.

10.3.5 The actual quantities of subsoil stored from the stripping operations shall be quantified prior to re-spreading, subsoils shall be re-spread evenly over the loosened overburden to the available thickness with minimal trafficking to prevent unnecessary compaction to the overburden layer. Following the laying of the subsoil, the whole depth of subsoil shall be ripped with a wing tyne subsoiler to alleviate compaction. Depending on the wing tyne used it may be necessary to lay the subsoil in layers that ensure that the profile is thoroughly loosened to its whole depth. Particular attention shall be paid to penetrating the interface with the previous layer which will ensure that no compacted layer exists, once the relaying of soils has been completed any compaction at depth will not be capable of being alleviated. The importance of de-compacting as each layer of soil is laid cannot be over emphasised, the objective is to bring any compaction to the surface where normal agricultural equipment can manage the task.

10.3.6 Stored topsoil shall be quantified and laid onto the subsoiled areas in the same fashion as the subsoil to an even thickness as determined by the resource available. On completion, the topsoil shall be ripped with a subsoiler preferably with a wing tyne suitable for agricultural operations, particularly attention shall be paid to the correct working depth in ensuring the interface with the subsoil is pierced and alleviates any compaction caused through the spreading process. Attention shall be taken in the machine settings so as not to intermix subsoil with topsoil in carrying out this operation.

10.3.7 All works to the top and subsoil shall be carried out when soil moisture levels are suitable, the machines used in carrying out this operation shall be tracked vehicles whenever possible with low ground pressure tracks.

10.3.8 The method described in replacing the soils is to maximise and utilise the soil resource conserved and stored in the storage mounds during the stripping operation in achieving an even thickness of reinstated soils that will

be suitable for the growing of the crop to be grown and to promote the intended after use of the land. To this end all activities in the replacement of soils are designed to ensure suitability, permeability and be free from compaction.

10.3.9 Soil testing shall be undertaken following the replacement of topsoil, to assess the pH, N:P:K content. The results of which and the intended after use shall form the basis for soil amelioration through the application of Lime if necessary and an appropriate fertiliser with an appropriate analysis to correct any deficiencies which may be apparent, relevant to the intended after use of the reinstated area.

10.3.10 During the subsoiling operations any stones or deleterious material likely to impede future agricultural operations shall be picked from the soil and disposed of. Attention shall be paid to picking and removing material having a diameter greater than 150 mm.

10.4 Landscaping

10.4.1 The features to be created are shown on the restoration plan, drawing N^{o} 10093/468.

10.4.2 Following the reinstatement of soils, agricultural cultivations shall be carried out. All cultivation operations shall be carried out when the soils are suitably dry as to produce a fine firm seedbed into which to sow grass seeds and shall be carried out as soon as is practicable following the soil loosening operations described above. Areas shown on the restoration plan to be planted with trees shall be sown with a low maintenance seeds mixture. Agricultural areas shall be sown with a agricultural seeds mixture.

10.4.3 Tree, hedge and shrub planting to the working area shall be carried out during the first available planting season October - March following the reinstatement of soils, prior to planting, the tree and shrub areas will be sown with a non aggressive grass seed mixture as detailed in Appendix N^{o} 2. This will assist in the protection of soils from erosion and the prevention the emergence of undesirable weed species which may establish themselves within the planting area. The grass will also provide diversity of habitat to the under-story of the trees. It is proposed that the tree areas numbered T1, T2 &T3 on the restoration plan shall be carried out by way of advanced tree planting which shall be carried out between October and March following the grant of planning permission. Prior to planting these areas the grass sward shall be sprayed off, cultivated and seeded with a grass seeds mixture as detailed in Appendix N^{o} 2.

10.4.4 Prior to planting additional ground preparation for tree planting shall be carried out once the grass sward has established. These works will consist of subsoiling with a single tyne subsoiler which shall be carried out slightly across the contours at 2 mtr centres over the area in which trees and shrubs are to be planted. This operation will assist plant roots to penetrate and establish plus promoting the movement of and retention of water along the rip lines, in all aiding the development of plants.

10.4.5 The trees and shrubs to be planted are detailed in Appendix N^{o} 3, the species shall consist of native species which in the main shall be planted as

45 - 60 cm bare rooted stock. The planting will be at a spacing of 2 mtrs between plants in species groups of 5, 7 and 9 randomly distributed throughout the planting areas. The smaller shrub planting is to be carried out predominately on the periphery of the planting areas and planted at 1 mtr centres.

10.4.6 All transplants shall be notch planted, the notches shall be vertical with sufficient depth to allow the roots to hang freely. When the plant is in position, the notch shall be closed and the soil well firmed around the roots. A top dressing of a suitable fertiliser shall be applied as determined through soil analysis. No fertiliser shall be placed against the stem or foliage of the plant.

10.4.7 Initial planting shall be carried out in the first available planting season, between October and March, all stock shall be UK sourced. The supervising officer is to approve the source of the plant material and shall inspect and approve the plants prior to planting. All plant material is to be healthy, vigorous and sound transplanted nursery stock with well-formed fibrous roots and heads and to have been grown at or for the supply nursery.

10.4.8 All plant material is to be packed at the supply nursery to ensure that there is no drying out in transit. After delivery, if planting is not to be carried out immediately bare rooted plants are to be heeled in by placing the roots in prepared trenches and covered with soil.

10.4.9 Replacement of failed plants will be undertaken annually to achieve by the end of year five, a ninety percent survival rate providing that any failed planting stations are evenly distributed throughout the areas.

10.4.10 During the aftercare period, maintenance tasks are considered necessary in order to achieve the establishment of the tree and shrub planting.

10.4.11 Currently the site is void of hedgerows. The aim is to reinstate live field boundaries between agricultural enclosures in the positions shown on the restoration plan comprising of a native species mix detailed at Appendix N^{o} 3 that will be planted in a double staggered row at a density of 7 plants per metre. Hedgerow trees are to be pit planted as feathered whips 1.5 mtrs in height in groups of three at 25m between groupings.

10.4.12 Ground preparation for the planting of hedgerow shall consist of a ploughed double furrow onto which the plants will be planted. During the aftercare period all failures shall be replaced annually. Firming up following frosts or high winds shall be undertaken to prevent the plant from becoming loose which would be detrimental to its development. Competitive vegetation around the hedge plants shall be removed annually either through the application of herbicides or through strimming/hand weeding. This operation shall be carried out during the aftercare period or until such time that competitive vegetation around the plants is deemed as to not be detrimental to the plants development.

Agricultural

10.4.13 The aim of the restoration of agricultural land is to restore the land to at least its former agricultural productivity, as identified in the Soil Resources and Agricultural Use Report. The soils have been identified as having free draining qualities, it is therefore not proposed to install a piped agricultural under drainage system.

10.4.14 On completion of the topsoiling operation the land shall be cultivated to produce a seedbed into which to sow seeds. A temporary agricultural seeds mixture shall be sown at a rate of 35kg/ha comprising of the seed varieties or similar as agreed with the Mineral Planning Authority.

10.4.15 Seedbed fertilisers shall be applied and incorporated within the seedbed with an analysis determined following soil analysis.

10.4.16 Cultivation in producing the seedbed will typically consist of the following operation, and only take place when the soil is friable and in suitable weather conditions. The topsoil will be subsoiled on completion of relaying soils followed typically by ploughing, discing, harrowing and rolling to produce a fine tilth into which to sow seeds. The seedbed will be lightly rolled following sowing.

10.4.17 The land will be sown with a permanent grass mix, typically a permanent seeds mixture will consist of the seed varieties detailed at Appendix N^{o} 2. The management during the aftercare period will be to cut the grass for hay/silage and graze. All stock will be removed from the land in adverse weather conditions particularly over the winter months.

10.4.18 At the commencement of each growing season soil samples shall be taken and analysed to ascertain the nutrient status of the soils, with fertiliser being applied as necessary having regard to correct any nutrient deficiencies that may exist and the crop to be grown, the aim is to achieve indices for P & K of 2.

10.4.19 Management to the end of the five-year aftercare period of the grassland will comprise of a regime of grazing, mowing for hay or silage. Grazing will be strictly controlled to prevent poaching of the soils in adverse conditions, no over wintering of stock will be permitted.

10.5 Fencing

10.5.1 Stock fencing shall be erected to an agreed specification typically as shown at Appendix N^{o} 5 of the full report as soon as is practicable having regard to ground conditions in allowing machinery to traverse the site. In addition to providing stockproof enclosures fencing will also provide protection to the newly planted hedge and tree plants. Field access gates shall be provided to allow access between enclosures for the effective management of the land.

10.6 Footpath

10.6.1 A footpath connecting Thewlis Lane with Balmoral Avenue will be created in the location shown on the Restoration Plan Drawing N^{o} 10093/462. The

footpath shall be constructed, having removed topsoil which shall be spread and levelled on the adjacent agricultural land, its construction shall be of stone, laid to falls and rolled to provide a hard surfaced that will provide an all weather surface to traverse. Appropriate gating shall be provided to allow access by walkers and the disabled whilst preventing unauthorised access particularly by motorcycles and horses.

10.7 Water Supplies

10.7.1 A piped water supply is to be installed to cattle drinking troughs in each enclosure that will allow the effective management for grazing stock of the land.

10.8 Aftercare Proposals

Future Management

10.8.1 To ensure successful establishment and long-term care of the restored landscape, this section of the report describes the proposed management and maintenance to be carried out during the five year aftercare period. These works will follow immediately on from and will to some extent overlap with the construction planting and seeding phases described above. The management regime has been designed to maximise the physical features within the landscape, the creation of sustainable habitats.

10.8.2 On completion of the construction and planting works the following components will exist on site.

- New hedgerows
- New hedgerow trees
- New native woodland planting
- Footpath
- Fencing and gates
- Water supplies
- New boundaries

10.8.3 Schedule of Tasks during the Five year Aftercare Period

Years 1-2
Grassland
Following the reinstatement of soils the land shall be cultivated and seeded with the seed mixture at Appendix N^{o} 2. The grass seeds sown shall be managed in such a way as to promote their development. During the first growing season it is anticipated that the agricultural enclosures will be mown for conservation of grass as hay/silage.

Tree and Hedgerow Planting
Shall be carried out during the first available planting season. Ground preparations will comprise of subsoiling along the line of planting with a cam created in to which to plant the hedge plants. Planting shall be to the agreed specification and quantities.

Fencing

Stock fencing shall be erected to the agreed specification as soon as is practicable having regard to ground conditions in allowing machinery to traverse the site. Fencing shall provide stockproof enclosures and provide protection to the newly planted hedge and tree plants. Field access gates shall be provided to allow access between enclosures for the effective management of the land.

Water supply
A piped water supply shall be installed to cattle drinking troughs in each enclosure, which will allow the effective management of the land.

Years 3 – 5
Grassland
To be managed within the rules of good husbandry in promoting the establishment of a vigorously growing crop. Annual soil testing will be carried out to establish the soils nutrient status. Corrective applications of any deficiencies that arise will be undertaken having regard for the crop growing and it intended use. Weed grasses shall be controlled as appropriate.

Hedgerows and tree areas
Annual assessment of the plants growing shall be undertaken. All failed plant will be replaced during the appropriate season. Weed control shall be undertaken as necessary during the growing season to eliminate competition from rank vegetation.

Water supplies
To be checked annually for leaks.

Fencing and gates
Annual inspections ensuring fences remain stock proof and prevent grazing stock from gaining entry to hedgerows and tree areas.

10.9 General

10.9.1 An annual aftercare report will be produced during the statutory aftercare period which will review the past years activities and recommendations for future years management.

11.0 CUMULATIVE IMPACTS

11.1 EIA Regulations

11.1.1 The statutory requirements regarding the content of an ES have been set out. Part 1 to Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended) provides that an ES may contain a "*description of the likely significant effects of the development on the environment, which should cover … cumulative … effects".* The same Part also states that *"a description of the aspects of the environment likely to be significantly affected by the development including … [the environmental topics] …and the inter relationship between the above factors*".

11.1.2 These are not a mandatory requirement of an ES, but one which "*is reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile*".

11.1.3 This Section of the ES therefore provides an assessment of the potential cumulative impacts arising through the proposed development. It also summarises the main interactions between the environmental topics that form part of the EIA.

11.1.4 Cumulative impacts are impacts that result from changes caused by other past, present or reasonably foreseeable actions, together with those directly attributable to the project. These guidelines detail the assessment of cumulative impact under two different definitions:

11.1.5 If planning permission were to be granted for the Thewlis Lane proposal, the two quarries would not be worked simultaneously for mineral extraction due to limitations on personnel and plant. Therefore when mineral extraction was taking place at Thewlis, no mineral extraction would be undertaken at Airfield Quarry therefore there would be no cumulative impact from these operations.

11.1.6 Condition 8 of planning permission 2003/62/91691/W0 states:

'the total tonnage of material exported from and imported from the sites shall not exceed 2500 tonnes per day in total'

11.1.7 The new proposals for the Thewlis Lane site will not increase this figure.

11.2 Predicted Impacts

11.2.1 This section describes the likely cumulative impacts associated with the existing and proposed mineral operations within the Crosland Moor Quarry complex. There are no other identified mineral sites within a distance where any cumulative impact would occur, therefore only the existing operations at JWQ are assessed.

i) Transport

11.2.2 Section 8.6 of the Environmental Statement has provided a detailed Transport Assessment of the proposals. As such, a robust assessment is provided and potential highways cumulative impacts have been assessed.

11.2.3 Notwithstanding this, it should be noted that the existing planning permissions for the site has no restrictions in terms of traffic movements but has a limit on material exported and imported between the operational quarries at the time of the planning permission in 2003. This was detailed not to exceed 2500 tonnes per day in total. We can confirm that this figure would not be exceeded with this proposal therefore no cumulative impact would occur.

11.2.4 The proposals for the Thewlis Lane site, would not result in more HGV movements than currently permitted, and therefore the proposals are neutral in terms of traffic flows and highway capacity.

ii) Dust & Air Quality

11.2.5 Cumulative impacts on air quality would result from traffic using the highway network and the internal haul road and emissions from industrial processes in the stone processing works. Baseline data has been obtained through monitoring air quality around the application site. This data will include emissions from the existing sources, allowing for a cumulative assessment to be undertaken. Further details of this are include in the detailed Dust and Air Quality assessment contained in Section 8.5 of the Environmental Statement.

11.2.6 In relation to air quality impacts from traffic, as noted above, the traffic impacts are neutral by virtue of the existing grant of planning permissions and no increase to the internal haulage movements is proposed and therefore impacts would be negligible.

11.2.7 After a thorough assessment of potential emissions produced by the development it has been concluded that there would be no significant adverse air quality effects for both human and ecological receptors which cumulatively would not hinder the site or the surrounding area.

iii) Noise

11.2.8 For noise, cumulative impacts can occur if noise from the proposal would add significantly to background noise levels at nearby receptors. In the vicinity of the application site, the noise climate is predominantly affected by traffic noise and the existing quarrying and stone processing operations at the JWQ site.

11.2.9 Section 8.4 of the Environmental Statement sets out a detailed noise assessment, based on worst case predictions on noise propagation. The assessment, which is based on recognised standards, compares predicted noise levels against measured background noise levels to assess the likely degree of impact. In so doing, the assessment considers the likelihood for cumulative impacts to occur.

11.2.10 The noise assessment has demonstrated that that noise generated by the proposed development at Thewlis Lane Quarry satisfied the planning guidance noise limit criteria as specified in the NPPF Technical Guidance at all potential noise sensitive properties for the duration of the proposed development. In most circumstances the development met the "*no more than 10dB above background"* criteria during typical quarry activity.

11.2.11 This assessment measured the combined impact of all the operations at JWQ and not just the Thewlis Lane proposal and it demonstrated that the cumulative impact of noise would not result in a significant increase of noise levels above the existing noise climate and as such, the likelihood of complaints is unlikely.

iv) Landscape and Visual

11.2.12 The Landscape and Visual impact assessment has concluded that the visibility of the application site is restricted and there is no intervisibility between the existing Crosland Moor extraction area and the proposed Thewlis Lane site therefore no cumulative landscape and visual impact will occur.

11.3 Conclusions

11.3.1 If planning permission were to be granted for the Thewlis Lane proposal, the two quarries would not be worked simultaneously for mineral extraction due to limitations on personnel and plant. Therefore when mineral extraction was taking place at Thewlis, no mineral extraction would be undertaken at Airfield Quarry therefore there would be no cumulative impact from these operations.

11.3.2 For this proposal, no significant impacts have been identified for any of the environmental topics considered as part of the EIA. Thus, no receptors are likely to experience any significant accumulated impacts from two or more sources.

12.0 ECONOMIC IMPACT

12.1 Introduction and Background

12.1.1 This economic assessment has sought to assess the potential economic impact of the proposed Thewlis Lane site and the continuation of operations of JWQ at Crosland Moor. This has been undertaken by:

- Reviewing the economic context within which the scheme would operate, identifying areas where the scheme will make a positive contribution;
- Quantifying the impact the scheme would have in terms of jobs and salary payments, looking at direct and indirect impacts, both at the local and regional level;
- Reviewing the needs and markets for the mineral

12.1.2 The NPPF encourages authorities to look positively at development that provides sustainable economic growth. The Thewlis Lane proposal would continue to have a positive impact upon the local and regional economy therefore meeting the Government's national policy objectives for economic growth.

12.1.3 Although the proposed development is temporary in nature, it would bring about local and regional economic benefits, and the retention of 100 full time employees for the duration of the scheme.

12.1.4 In overall terms, mineral extraction is a significant source of employment, particularly when all of the ancillary suppliers of materials and services are taken into account.

12.1.5 JWQ's existing operational quarries and stone processing works and infrastructure are already a major feature in the landscape, and an important local employer, having been operated and extended over many years

12.1.6 The assessment describes current economic and social conditions in and around the Crosland Moor area as a precursor to considering likely impacts on the local economy and its population if the planning application is or is not approved.

12.1.7 The proposal being made by Johnsons Wellfield Quarries Ltd is fully described in the Environmental Statement (ES). The currently remaining permitted reserves at Crosland Moor Quarry will be exhausted in less than 3 years at current rates of working. If granted, the application will add a further 200,000 tonnes of sandstone to be extracted over a period of 8 years after the current reserves are exhausted.

12.1.8 Current economic and social conditions around JWQ operations are in part determined by the site's history, and they reflect the fact that mineral extraction has been a substantial feature of the local economy (in the Crosland Moor area since at least the 19th century. This has left a legacy both on the landscape, and on the pattern of employment and skills to be found locally.

12.2 Current Economic State

12.2.1 The UK economy continues to emerge from the effects of the financial crisis which began in late 2007. The UK economy has undergone a dramatic phase of slowdown in growth and investment, officially entering a recession between January 2009 and January 2010.

12.2.2 In assessing the economic impact of this proposed scheme, this financial background must be considered, both in terms of the economic climate that existed, but also emphasizing the importance of economic investment during a difficult period.

12.2.3 Based on information contained in Kirklees Local Economic Assessment 2010/2011, overall economic performance of the Kirklees economy has been below neighbouring areas, over the last decade with lower levels of productivity and economic growth.

12.2.4 Below are the key areas relevant to this particular proposal which were highlighted in the findings of the Kirklees Local Economic Assessment 2010/11:

- **The Local Economy** - Major challenges face Kirklees economy: re-balancing provides the prospect of greater economic resilience and higher levels of economic growth.
- **Employment** – More local job creation is essential to meet the needs of a growing population, and to avoid higher levels of worklessness and deprivation.
- **Business and Enterprise** - Increasing levels of entrepreneurship in Kirklees but fewer firms employ anyone under 25. Investment in skills and the provision of employment land are priorities for raising local economic capacity.
- **Key Strategic Sectors of Importance** - Business Services, Health, Construction and Distributions have best chance of seeing growth, but Advanced Manufacturing, Culture and Green Technologies will be strategically important.

12.2.5 Kirklees is the 11th most populous local authority area in England with a population estimated to be 403,600 as of August 2008. The proportion of residents of working age (currently 16 to 59 for females and 16 to 64 for males) is 61.8% which is slightly above the England average for all local authority areas (61.2%) but is almost within the top third.

12.3 Employment

Kirklees Area

12.3.1 The economy supports around 150,000 jobs but the Kirklees population has almost 200,000 residents who are either in work or unemployed i.e. a large short fall of quality employment for local residents.

12.3.2 Kirklees has a local labour market characterized by fewer full-time jobs and conversely, more part-timers who are mainly female and on lower incomes)

but also a predominantly low waged and lower skilled workforce (with up to 69,000 employees that are either unqualified or low skilled).

12.3.3 Mineral extraction is traditional in the area, and jobs in these industries are an integral component of the regional economy. The winning of natural resources is the basis to manufacturing industry, and service employment is dependent upon the redistribution of the wealth thus created. Such sites are essential to the maintenance of a viable minerals industry, and carefully controlled production is compatible with wider strategic objectives for the economy and the environment.

12.3.4 Kirklees has an unemployment rate of 4.4% based on figures from June 2011. This is slightly higher than the Yorkshire & Humber average (4.3%) and the National average (3.7%)

12.3.5 Kirklees has a workless population of 35,135. Excluding claimants for Job Seekers Allowance, the loss in productivity on this scale of worklessness could be up to £840 million (2010 figures) for the Kirklees economy.

12.3.6 The Kirklees economy supports around 150,000 jobs, but the Kirklees population contains almost 200,000 residents who are either in work or unemployed – therefore, Kirklees is relatively 'job poor; as its Job density (at 0.65) is well below the national average.

12.3.7 The Kirklees labour market can be characterized by as having a lower employment rate (compared to the regional and national average), fewer full-time jobs and more part-timers (who are mainly female and on lower incomes) – but is made up of approximately equal numbers of male and female employees.

12.3.8 The local economy, in terms of its labour market, can also be described as being predominantly low waged and lower skilled, (with up to 69,000 employees that are either unqualified or low skilled).

12.3.9 In employment terms the most important sector is manufacturing, which accounts for just under one fifth of all employment in the Kirklees area. Other important sectors include education, health and retail. Somewhat surprisingly, given the number of quarries to be found locally, the mining and quarrying sector is not a particularly significant employer providing only 0.7% of all jobs in Kirklees compared to 1.2% nationally.

12.4 JWQ – Current Economic Importance

Processes and Employment

12.4.1 JWQ is part of the Myers Group which employs approximately 350 people in total. JWQ employs over 100 people directly. JWQ has contributed hugely to the economic development of Kirklees and are one of the foremost suppliers of engineered natural stone products in Britain.

12.4.2 The company operates from Crosland Hill where the processing of stone is undertaken using mineral extracted from its nearby workings. The Crosland Hill works is one of the largest and best equipped dimension stone working

plants in Europe. Massive and continued investment in the most advanced stone working machinery and quarry plant has enabled the company to remain firmly at the forefront of the UK stone industry.

12.4.3 Mineral extraction is a significant source of employment, particularly when all the ancillary suppliers of materials and services are taken into account. From both a national and local perspective, competition from foreign imports is a threat to this source of employment and income.

12.4.4 There are 100 full time staff employed at JWQ. In addition there are indirect local employment prospects sustained by money spent in connection with the project which could be a further 25 people such as subcontractors, plant suppliers, construction materials suppliers, fuel suppliers etc. Should planning approval not be obtained then it will have implications for JWQ and the Myers Group as a whole.

12.4.5 Employment costs in the 2011 – 12 financial year for JWQ were £2.5million, the Myers Group costs were £8.5 million. Expenditure in the same financial year at JWQ were £5.4 million (including wages), the Myers Group expenditure was £34 million.

Sales of Blockstone

12.4.6 Analysis of the last 15 years of JWQ production shows a steady upward trend in sales. This is despite the uncertainties of the general economy and the natural variability of the mineral available to the company within the areas for which it has had approval to extract.

12.4.7 Demand for the company's products has not been the factor determining the company's performance over that period of time. Demand has been steady or growing, with the increase in output relating to the company's capacity to meet that demand. Not withstanding improvements in techniques, investment in training, machinery etc, the single most important influence on the capacity to meet demand is the availability the company of mineral of appropriate quality and quantity. The availability of mineral is directly related to planning approvals for extraction that the company can obtain.

12.4.8 As well as the direct benefits to JWQ and the employment effects which benefit their workforce, there will be a series of spin-off benefits which are referred to as 'indirect effects'.

12.4.9 These arise because Johnsons Wellfield Quarries expenditure induces their suppliers to sustain their production to meet their needs. In a 'virtuous circle', any sales made by JWQ suppliers generates more business for the firms which in turn supply them. These effects are referred to as 'indirect effects' and occur down the supply chain.

12.4.10 Sales figures for JWQ in 20111/12 were £5.8 million.

12.5 Conclusion

12.5.1 The proposal will reinforce a locally, regionally, and nationally important facility. Although very few additional jobs will be created, because the

scheme is essentially a way of replacing a resource which will soon be worked out, existing jobs will be protected.

12.5.2 In addition to the direct and indirect benefits of the proposal, it will also induce benefits to the local and national economy through a multiplier effect.

13.0 PLANNING POLICY

13.1 Introduction

13.1.1 The National Planning Policy Framework (NPPF) was published on 27 March 2012 The NPPF has replaced current Planning Policy Guidance (PPG), Planning Policy Statement's (PPS), Mineral Planning Guidance (MPG) and Mineral Planning Statement's (MPS).

13.1.2 The Town and Country Planning Act 1990, the Planning and Compensation Act 1991, the Environment Act 1995 and the Planning and Compulsory Purchase Act 2004, provide the main basis for the control of mineral development.

13.1.3 The policy framework for the application for planning permission, to which this ES relates, comprises the Development Plan and other material planning considerations – including national planning policies and other relevant existing and emerging policies and guidance.

13.1.4 In this case, the Development Plan comprises the:

- Kirklees Unitary Development Plan (UDP) adopted 1999.

13.1.5 The relevant emerging development plan documents are the:

- Kirklees Local Development Framework Core Strategy
- Kirklees Minerals and Waste Development Plan Document

13.1.6 Neither of these documents are close to adoption. At the time of writing the LDF Core Strategy was at the draft consultation stage.

13.2 National Policy

The National Planning Policy Framework (NPPF)

13.2.1 The National Planning Policy Framework (NPPF) was published on the 27th March 2012 and is the principle policy document which sets out the overarching planning policy that shall be implemented through the development plan and determination process. NPPF identifies a presumption in favour of sustainable development. There are three dimensions to sustainable development, economic, social and environmental, the planning system as a function should to perform a number of roles;

- 'An economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places at the right time...'
- 'A social role – supporting strong, vibrant and healthy communities by providing the supply of housing required...'
- 'An environmental role – contribution to protecting and enhancing our natural, built and historic environment; and as part of this helping to improve biodiversity, use natural resources prudently, minimise waste

and pollution and mitigate and adapt to climate change including moving to a low carbon economy.'

13.2.2 Sections 18 to 219 taken as a whole contribute to the definition of sustainable development which includes the implications upon mineral extraction and reclamation.

13.2.3 The presumption in favour of sustainable development means; approving development proposals that accord with the development plan without delay, and where the development plan is absent, silent or relevant policies are out of date, granting planning permission unless – any adverse impacts of doing so would significantly and demonstrably outweigh the benefits. The benefits should be assessed against the policies in this framework taken as a whole; or as specific policies in this Framework indicate development should be restricted.

Facilitating the sustainable use of Minerals

13.2.4 Minerals are essential to support sustainable economic growth and our quality of life. It is therefore important that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs. However, since minerals are a finite natural resource, and can only be worked where they are found, it is important to make best use of them to secure their long-term conservation.

13.2.5 In preparing Local Plans, local planning authorities should:

- identify and include policies for extraction of mineral resource of local and national importance in their area, but should not identify new sites or extensions to existing sites for peat extraction;

- so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;

- define Minerals Safeguarding Areas and adopt appropriate policies in order that known locations of specific minerals resources of local and national importance are not needlessly sterilised by non-mineral development, whilst not creating a presumption that resources defined will be worked; and define Minerals Consultation Areas based on these Minerals Safeguarding Areas;

- safeguard:

– existing, planned and potential rail heads, rail links to quarries, wharfage and associated storage, handling and processing facilities for the bulk transport by rail, sea or inland waterways of minerals, including recycled, secondary and marine-dredged materials; and
– existing, planned and potential sites for concrete batching, the manufacture of coated materials, other concrete products and the handling, processing and distribution of substitute, recycled and secondary aggregate material.

- set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non-mineral development to take place;

- set out environmental criteria, in line with the policies in this Framework, against which planning applications will be assessed so as to ensure that permitted operations do not have unacceptable adverse impacts on the natural and historic environment or human health, including from noise, dust, visual intrusion, traffic, tip- and quarry-slope stability, differential settlement of quarry backfill, mining subsidence, increased flood risk, impacts on the flow and quantity of surface and groundwater and migration of contamination from the site; and take into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;

- when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction; and

- put in place policies to ensure worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place, including for agriculture (safeguarding the long term potential of best and most versatile agricultural land and conserving soil resources), geodiversity, biodiversity, native woodland, the historic environment and recreation.

13.2.6 When determining planning applications, local planning authorities should:

- give great weight to the benefits of the mineral extraction, including to the economy;

- as far as is practical, provide for the maintenance of landbanks of non-energy minerals from outside National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage sites, Scheduled Monuments and Conservation Areas;

- ensure, in granting planning permission for mineral development, that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;

- ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties;

- not grant planning permission for peat extraction from new or extended sites;

- provide for restoration and aftercare at the earliest opportunity to be carried out to high environmental standards, through the application of appropriate conditions, where necessary. Bonds or other financial

guarantees to underpin planning conditions should only be sought in exceptional circumstances;

- not normally permit other development proposals in mineral safeguarding areas where they might constrain potential future use for these purposes;

- consider how to meet any demand for small-scale extraction of building stone at, or close to, relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites; and

- recognise the small-scale nature and impact of building and roofing stone quarries, and the need for a flexible approach to the potentially long duration of planning permissions reflecting the intermittent or low rate of working at many sites.

Minerals of local and national importance:

13.2.7 The NPPF has identified that: 'Minerals which are necessary to meet society's needs, including aggregates, brickclay (especially Etruria Marl and fireclay), silica sand (including high grade silica sands), cement raw materials, gypsum, salt, fluorspar, shallow and deep-mined coal, oil and gas (including hydrocarbons), tungsten, kaolin, ball clay, potash and 'local minerals of importance to heritage assets and local distinctiveness'

13.2.8 The sandstone extracted from the Crosland Moor quarries has been supplied to some of the country's most prestigious projects. The stone found in the proposed Thewlis Lane site is of a very high quality and is highly sought after. There are very few quarries in the country who supply dimension stone products of such high quality and it is of local and national significance.

Green Belt

13.2.9 Certain other forms of development are also not inappropriate in Green Belt provided they preserve the openness of the Green Belt and do not conflict with the purposes of including land in Green Belt. These are:

- mineral extraction;
- engineering operations;
- local transport infrastructure which can demonstrate a requirement for a Green Belt location;
- the re-use of buildings provided that the buildings are of permanent and substantial construction; and
- development brought forward under a Community Right to Build Order.

Technical Guidance to the NPPF

Proximity of mineral workings to communities

13.2.10 Minerals Planning Authorities are expected to ensure that plan proposals do not have an unacceptable adverse effect on the natural or historic

environment or human health. Residents living close to mineral workings may be exposed to a number of environmental effects and particular care should be taken in respect of any conditions they attach to a grant of permission for working in proximity to communities.

13.2.11 A programme of work should be agreed which takes account, as far as is practicable, of the potential impacts on the local community over the expected duration of operations. The programme of work and/or the location of plant within the mineral working should take account of the proximity to occupied properties, as well as legitimate operational considerations.

13.2.12 In some circumstances, new or extended permissions for minerals extraction close to residential property may not provide adequate protection. In such cases, it may be justified to consider adequate separation distances. Any such distance should be effective but reasonable, taking into account:

- the nature of the mineral extraction activity (including its duration);
- the need to avoid undue sterilisation of mineral resources, location and topography;
- the characteristics of the various environmental effects likely to arise; and
- the various amelioration measures that can be applied.

13.2.13 Working in proximity to residential property may be necessary where there are clear, specific achievable objectives such as the removal of instability and preparing land for subsequent development. Such working should be for a limited and specified period, without scope for extension.

Dust emissions

13.2.14 The National Planning Policy Framework makes it clear that unavoidable dust emissions are controlled, mitigated or removed at source. A dust assessment study should be undertaken by a competent person/organisation with acknowledged experience of undertaking this type of work.

13.2.15 Dust is the generic term which BS6069 (Part 2) Characterization of air quality Glossary (1987) uses to describe particulate matter in the size range 1–75 μm (micrometres) in diameter.

13.2.16 Particles that are less than or equal to (≤) 10 μm in diameter are commonly referred as PM10. 15

13.2.17 The scope of a dust assessment study should be agreed with the minerals planning authority and local planning authority. Such studies should be used to:

- establish baseline conditions of the existing dust climate around the site of the proposed operations;
- identify site activities that could lead to dust emission without mitigation;

- identify site parameters which may increase potential impacts from dust; recommend mitigation measures, including modification of site design; and
- make proposals to monitor and report dust emissions to ensure compliance with appropriate environmental standards and to enable an effective response to complaints.

Noise emissions

13.2.18 The National Planning Policy Framework makes it clear that minerals planning authorities should ensure that unavoidable noise emissions are controlled, mitigated or removed at source. It further recognises that mineral planning authorities should also establish appropriate noise limits for extraction in proximity to noise sensitive properties.

13.2.19 Those making development proposals should carry out a noise emissions assessment, which should identify all sources of noise and, for each source, consider the proposed operating locations, procedures, schedules and duration of work for the life of the operation. Proposals for the control or mitigation of noise emissions should consider:

- the main characteristics of the production process and its environs, including the location of noise-sensitive properties;
- proposals to minimise, mitigate or remove noise emissions at source;
- assessing the existing noise climate around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;
- estimating the likely future noise from the development and its impact on the neighbourhood of the proposed operations;
- monitoring noise emissions to ensure compliance with appropriate environmental standards.

Noise standards

13.2.20 Subject to a maximum of 55dB(A)LAeq, 1h (free field), mineral planning authorities should aim to establish a noise limit at the noise-sensitive property that does not exceed the background level by more than 10dB(A). It is recognised, however, that in many circumstances it will be difficult to not exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator. In such cases, the limit set should be as near that level as practicable during normal working hours (0700-1900) and should not exceed 55dB(A) LAeq, 1h (free field). Evening (1900-2200) limits should not exceed background level by more than 10dB(A) and night-time limits should not exceed 42dB(A) LAeq,1h (free field) at noise-sensitive dwellings. Where tonal noise contributes significantly to the total site noise, it may be appropriate to set specific limits for this element. Peak or impulsive noise, which may include some reversing bleepers, may also require separate limits that are independent of background noise - e.g. Lmax in specific octave or third-octave bands - and should not be allowed to occur regularly at night.

13.2.20 All mineral operations will have some particularly noisy short-term activities that cannot meet the limits set for normal operations. Examples include soil

stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance. However, these activities can bring longer-term environmental benefits.

13.2.21 Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to 8 weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs. Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum.

Restoration and aftercare of mineral sites

13.2.22 The National Planning Policy Framework requires that planning authorities should provide for restoration and aftercare at the earliest opportunity to be carried out to high environmental standards. This should include through provision of a landscape strategy, restoration conditions and aftercare schemes as appropriate. For the purposes of the Framework and this technical guide:

- restoration means operations associated with the winning and working of minerals and which are designed to return the area to an acceptable environmental condition, whether for the resumption of former land use or a new use; and
- aftercare means the use that land, used for minerals working, is put to after restoration.

Landscape strategy

13.2.23 A site-specific landscape strategy to accompany applications for either a new site or any significant extension to an existing working site should include:

- defining the key landscape opportunities and constraints;
- considering potential directions of working, significant waste material locations, degrees of visual exposure etc;
- identifying the need for additional screening during operations;
- identifying proposed after-uses and preferred character for the restored landscape.

13.2.24 Landscape and reclamation plans should address the impacts which mineral extraction can have on the existing landscape. These will include the working face and operations at the face, locations of waste tips, and haul roads.

13.2.25 Coordination of phasing, provision of temporary or permanent screening, and progressive reclamation can together minimise visual impact and the impact on landscape quality.

Reclamation conditions/schemes

13.2.26 Reclamation schemes should indicate how the restoration and aftercare of the site is to be integrated with the working scheme, and should demonstrate the suitability of the proposals of the proposed after-use. Before designing a reclamation scheme, the operator should undertake a comprehensive site survey to identify any existing features on the site that may be incorporated into the reclamation scheme, together with a survey of the soil resource and site hydrology. Consideration should also be given to the potential impacts of the reclamation proposals on adjacent land.

13.2.27 To demonstrate that a site can be reclaimed to an acceptable standard and after-use, the applicant is advised to prepare, at the outset, a working plan which includes restoration proposals and is based upon findings from the site investigation.

13.2.28 Where a permission is granted, the conditions should be drafted in such a way that, even if the interest of the mineral operator applying for permission is subsequently disposed of, the requirements for reclamation can still be fulfilled, whether by a new operator or in the case of default, by the landowner.

13.2.29 Planning conditions for reclamation should be specific to the proposed site and should normally be framed with the intended after-use in mind. They will vary according to:

- the characteristics of the individual site;
- the intended after-use;
- the type of mineral to be worked;
- the method of working;
- the timescale of the working;
- the general character of, and planning policies for the area.

13.2.30 For after-uses which involve some form of plant growth (e.g. for agriculture, forestry or amenity including some forms of nature conservation), the plan will usually involve a number of key stages:

i. stripping of soils and soil-making materials and either their storage or their direct replacement (i.e. 'restoration') on another part of the site;
ii. storage and replacement of overburden;
iii. achieving the landscape and landform objectives for the site, including filling operations if required, following mineral extraction;
iv. restoration, including soil placement, relief of compaction and provision of surface features;
v. aftercare.

13.2.31 Where possible, it is normally desirable to have 'progressive' or 'rolling' reclamation to minimise the area of land occupied at any one time by the mineral working, unless to do so would be likely to affect adversely the

standard of reclamation achieved, or would be impractical having regard to the type of operation and nature of the site. Conditions for progressive reclamation normally limit the area taken for mineral working at any one time and relate it to the rate of restoration of earlier phases of the operation. It is, however, important that conditions permit a sufficient area of land to be stripped of soils in advance of mineral extraction to allow for wet years when soil stripping operations may be impracticable. It is not advisable to specify actual dates in conditions for phasing unless there are overriding reasons to do so.

13.2.32 For short-term workings it is usually appropriate to impose a detailed set of conditions at the time of granting planning permission. For longer-term workings, early agreement on the details of at least the later stages of reclamation may not be appropriate. However, in such cases, it would still be appropriate to provide a general outline of the final landform and intended after-use.

13.2.33 It would also be appropriate to agree at the outset outlines of requirements covering the main stages (e.g. filling, restoration and aftercare), together with detailed schemes for stripping and storage of soil materials. This must be sufficient to clearly demonstrate that the overall objectives of the scheme are practically achievable. Such workings should then normally require the submission of a detailed scheme or schemes for restoration and aftercare, for agreement, by some specific stage towards the end of the life of the permission. Sites where progressive reclamation is to be carried out can require submission of schemes for agreement from time to time as appropriate.

Aftercare schemes

13.2.34 The preparation of a successful aftercare scheme requires two levels of information from the mineral operator:

- an outline strategy of commitments for the five year aftercare period; and
- a detailed programme for the forthcoming year.

13.2.35 The outline strategy should broadly outline the steps to be carried out in the aftercare period and their timing within the overall programme. These should include, as appropriate:

- timing and pattern of vegetation establishment;
- cultivation practices;
- secondary treatments;
- drainage;
- management of soil, fertility, weeds etc;
- irrigation and watering.

13.2.36 A map should accompany the outline, identifying clearly all areas subject to aftercare management, with separate demarcation of areas according to differences in the year of aftercare and proposed management. Where a choice of options is retained this should be made clear together with criteria to be followed in choosing between them.

13.2.37 The detailed programme should cover requirements for the forthcoming year. It should:

- amplify the outline strategy for work to be carried out in the forthcoming year;
- confirm that steps already specified in detail in the outline strategy will be carried out as originally intended;
- include any modifications to original proposals e.g. due to differences between actual and anticipated site conditions.

13.2.38 The programme should provide for specific steps where appropriate, including:

- vegetation establishment;
- vegetation management;
- secondary treatments;
- field drainage;
- irrigation/watering;
- tree and hedge establishment.

13.3 Local Policy

Kirklees Unitary Development Plan (UDP) – Revised (2007)

13.3.1 Kirklees Council is currently working on its Local Development Framework Core Strategy – Draft Proposals, which was released for consultation late in December 2010. Until this document is formally adopted, the following saved policies which are contained within the UDP. Chapter 6 of the UDP currently provides the existing policy base for minerals extraction and development.

13.3.2 Policies contained within the Kirklees UDP deal with the extraction of minerals.

13.3.3 Policy M1 requires the Council to consider proposals for mineral working against environmental impact, the needs of business and industry and restoration and afteruse.

Policy M1 states:
"*Proposals for mineral extraction, which should include measures for restoration and afteruse of the site, will be considered having regard to:*

i The impact on the environment, including water resources and best and most versatile agricultural land;
ii The impact on residential amenity and highway safety; and
iii The needs of business and industry."

13.3.4 Policy M1 is expanded in Policies M3 and M3A which state:

M3 - Criteria for assessing minerals applications
"Proposals to explore for or to extract minerals will normally be permitted provided that they would not:

i cause unacceptable detriment to landscape or local visual amenity during or subsequent to extraction;

ii be materially detrimental to interests of nature conservation, cultural heritage, geological or archaeological importance;
iii cause nuisance or materially significant disturbance to local residents as a consequence of the generation of dust, noise or vibration by site operations or associated transport;
iv prejudice highway safety through the volume or nature of vehicle movements generated;
v result in pollution of water resources or soils or the interruption of land drainage;
vi cause materially significant permanent change to local rights of way networks; or
vii result in permanent loss of best and most versatile agricultural land.

13.3.5 Applications to extract minerals should be accompanied by sufficient information to demonstrate that such unacceptable impacts would not result or could be controlled and to demonstrate the presence of the mineral. Whenever proposals, except those involving the extraction of energy minerals, would result in unavoidable adverse impacts on local amenity or the environment, they should be accompanied by information to demonstrate the need to extract the mineral as well as the absence of more suitable alternative sources of supply."

13.3.6 Policy M3A states:
"Proposals to explore for or extract minerals should, in addition to satisfying the requirements of policy M3 above, also provide for beneficial after use of the site to agriculture, forestry or amenity use, having regard to any provisions of the Plan which apply to the site or its surroundings, by including arrangements for progressive working, phased restoration and aftercare."

13.3.7 The site does lie within the West Yorkshire Green Belt, but paragraph 2.32 of the UDP notes that PPG2 sets out what types of development are appropriate within the Green Belt. Mineral working is one of the uses defined in the Guidance Note. The Dearne Lea proposal does not detract from the purposes of including land within the Green Belt.

Kirklees Draft LDF Consultation – Dec 2010 to Feb 2011

13.3.8 The draft LDF consultation contains the following policies which are relevant to this particular proposal but can only be a material consideration at this stage.

POLICY CS12 – Air Quality
Action will be taken to reduce emissions from sources which contribute to poor air quality.
Development proposals which have the potential to generate emissions affecting air quality will be required to incorporate measures to mitigate or off-set locally their emissions and impacts.
In areas where air quality is a matter of concern, development proposals will be required to deliver a positive impact on local air quality.
Development proposals should ensure through their location or design that occupants are not exposed to air quality that exceeds acceptable levels.

POLICY CS13 – Noise

Action to lessen noise will be taken in areas that suffer from excessive environmental noise.
Development proposals should ensure that local residents and workers are not exposed to environmental noise that exceeds acceptable levels.
Development proposals which have the potential to generate environmental noise will be required to incorporate measures to avoid, prevent or reduce their environmental noise and its impacts.
Developments within or near Quiet Areas will need to demonstrate that they do not increase the environmental noise within any designated Quiet Area.

POLICY CS17 – Landscape
Development proposals should take into account the landscape character of the area as described in the landscape character assessment and consider:
a) views in and out of the Peak District National Park and views from surrounding viewpoints;
b) the setting of settlements and buildings within the landscape;
c) the patterns of woodland, trees and field boundaries;
d) the appearance of rivers, canals, reservoirs and other water features within the landscape.

POLICY CS33 – Minerals Supply
The council will seek to maintain the continuity of supply of minerals by identifying allocations for mineral extraction within the areas of search shown on the key diagram and by taking into account market pressures when considering subsequent planning applications for extraction from allocated land. It will also ensure that Kirklees' contribution to West Yorkshire's output of aggregates is achieved by building up a crushed stone landbank.

POLICY CS34 – Mineral Safeguarding
Within the areas shown on the key diagram as minerals safeguarding areas, including the "viable surface coal resource", development proposals for:

a) any site within the sand and gravel safeguarding area
b) sites of more than 1 hectare within the sandstone safeguarding area and
c) sites of more than 5 hectares within the clay and shale safeguarding areas or viable surface coal resource must include an assessment of the quantity and quality of the underlying mineral resource and the potential effect of the proposed development on mineral extraction on adjacent land. On the basis of this assessment the developer must either demonstrate that the mineral is not of sufficient quantity or quality to justify extraction or make provision for the removal of the mineral before development takes place.