



Seven Star Natural Gas Limited

## Three Nooks Farm: Phase 2

Application to extract underground gas for power generation on land at Three Nooks Farm, Horton, Leek

Planning Statement

P41396

JULY 2012



**RSK**

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## RSK GENERAL NOTES

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**Title:** Three Nooks Farm: Phase 2  
Planning Statement  
**Client:** Seven Star Natural Gas Limited  
**Date:** 13 July 2012  
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# 1 INTRODUCTION

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## 1.1 Background to the Application

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- 1.1.1 This Planning Statement provides information in support of a planning application submitted to Staffordshire County Council (SCC) under the provisions of the Town and Country Planning Act 1990 (as amended) by Seven Star Natural Gas Limited (the applicant).
- 1.1.2 The applicant is seeking planning consent for a proposal to harness and utilise underground methane gas to generate electricity through the implementation of gas to power technology (the proposed scheme) on land at Three Nooks Farm in Horton, Leek (the site).
- 1.1.3 This application falls to SCC to determine as the Minerals Planning Authority.
- 1.1.4 The proposed scheme forms Phase 2 of planned operations at the site. Details of the Phase 1 are contained in planning application ref: SM.11/18/161 M; this was granted permission by SCC on 5<sup>th</sup> April 2012 and is currently in the process of being implemented on site by the applicant. The relationship between Phases 1 and 2 is described in **Section 4** this document.
- 1.1.5 The proposed scheme will involve: the demolition of an existing agricultural barn; construction of a new purpose built barn (shared between the applicant and the farmer) to accommodate gas-powered electricity generating plant; construction of ancillary equipment; the laying of service and distribution pipes; and construction of a new silage clamp.
- 1.1.6 To provide a means of transferring generated electricity to the local distribution system, Western Power Distribution – the local District Network Operator (DNO) – will be responsible for the installation of an 11kV underground electricity cable connection under Permitted Development Rights<sup>1</sup>. Preliminary discussions have identified a potential connection point in Biddulph Moor (Ridgefields) and potential cable routes; however the final decision on the network connection is a matter for Western Power Distribution to determine and accordingly this aspect falls outside the scope and coverage of this planning application.
- 1.1.7 This Statement provides: a description of the proposed scheme and its background context; a description of the location of the site and its immediate environs; a summary of the need for the scheme and the findings of detailed assessments undertaken in respect of its potential environmental impacts; and a summary of the relationship between the proposals and relevant planning policies.
- 1.1.8 This planning application and all supporting information has been prepared by RSK Environment Ltd on behalf of the applicant. RSK Environment Ltd is independent planning and environmental consultancy with experience in developments of the type proposed. Preparation of this application has been informed by detailed consultation with Staffordshire County Council, landowners, and relevant statutory and non-statutory bodies.
- 1.1.9 The planning application comprises the following documentation.
- A Planning Statement (inc. figures, photographs, and supporting appendices).
  - A Design and Access Statement.

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<sup>1</sup> SI 2010 2184 – The Town and Country Planning (Development Management Procedure) (England) Order 2010

- Completed application forms applying for planning permission to carry out the proposed works.
- Completed Agricultural Certificates and Notices.

## **1.2 Background to the Applicant**

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- 1.2.1 Seven Star Natural Gas Limited is a wholly owned subsidiary of Alkane Energy plc, and was acquired by the company in May 2011.
- 1.2.2 Alkane Energy plc is the market leader in the UK gas-to-power market, and is principally involved in the development of onshore methane gas reserves to generate electricity. The company has a first class reputation for operating sites which fully conform with all legislation and regulations required for the development and operation of small scale electricity producing generators.
- 1.2.3 The company currently has an installed electrical generating capacity of 70MW covering 19 mid-size power plants (comprising coal mine methane and conventional gas) across a number of environmentally sensitive sites across the United Kingdom.
- 1.2.4 Electricity at these sites is generated using standard modular reciprocating engines that, along with other ancillary plant, are designed to be flexible and transportable. This allows additional capacity to be brought onto growing sites and under utilised plant to be moved to new sites to maximise efficiency.
- 1.2.5 Alkane Energy plc sells this power generated to the electricity distribution network.

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## **2 NEED FOR THE PROPOSED SCHEME**

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### **2.1 UK Climate Change and Natural Gas Supplies**

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- 2.1.1 Natural gas plays a pivotal role in both the UK's economy and providing security of electricity supply.
- 2.1.2 The 2010 Department of Energy and Climate Change (DECC) published report "Gas Security of Supply: A policy statement from the Department of Energy and Climate Change" stated that gas is the primary energy source in the UK, providing some 50% of Britain's energy supply (exc. transport). There is a growing demand for energy in the UK, and an increasing reliance on gas as the 'cleanest' and most reliable of the fossil fuels.
- 2.1.3 Secure and diverse sources of energy are an important part of national policy. The general consensus is that gas will continue to play a central role in the UK's energy mix in the future; however genuine concerns exist over sustainability, given that the UK's economy is anticipated to need to import around 80% of its gas requirements by 2020. Furthermore, the UK requires additional power generation capacity to replace many of its ageing nuclear and coal fired power stations which are scheduled for decommission in the coming years.
- 2.1.4 It is forecast that the UK will become increasingly dependent upon gas imports from a globally competitive market. In order to reduce reliance on energy imports, the UK needs to explore domestic gas reserves that have the potential to be used to generate electricity, in a way that does not adversely affect the environment.
- 2.1.5 Onshore gas production currently makes a small contribution to overall UK production compared to offshore production. Central Government is encouraging investment in indigenous onshore gas production to ensure that the UK's remaining gas reserves are exploited to the fullest, whilst being mindful of the need to move towards a sustainable, low carbon economy.
- 2.1.6 Accordingly, harnessing underground gas reserves to generate electricity – as is proposed at Three Nooks Farm – will positively respond to the challenges associated with climate change, and will contribute to providing a more sustainable and environmentally friendly alternative to both importation and the technologies currently used to generate power in the UK.

### **2.2 Petroleum Exploration and Development Licences**

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- 2.2.1 Ownership of the UK's petroleum resources is vested in the Crown.
- 2.2.2 The Secretary of State issues landward production licences (termed Petroleum Exploration and Development Licences) (PEDL) under powers granted by the Petroleum Act 1998. A PEDL confers rights to search for, bore for and get hydrocarbons over a limited area and for a limited period of time.
- 2.2.3 The site is covered by the terms of the Department of Energy and Climate Change (DECC) UK Onshore PEDL 141. The area covered by PEDL 141 covers a standard 10km x 10km, square within which the site is located. Alkane Energy plc acquired PEDL 141 when it purchased Seven Star Natural Gas Limited.
- 2.2.4 Planning permission is required by DECC before they will grant the applicant consent to implement the proposed scheme.

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## **2.3 Benefits of the Proposed Scheme**

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2.3.1 There are a number of social, economic and environmental benefits associated with development of the type proposed.

- It represents a secure, indigenous energy resource which, when harnessed and converted, can assist in ensuring security of electricity supply in the medium-term (circa 20 years operational lifespan).
- It provides a cleaner, more environmentally acceptable alternative to the use of oil and coal.
- Onshore reserves have the advantage of being in closer proximity to points of consumption when compared to offshore reserves.
- Recent technological advances means onshore gas wells are economically viable and safe to exploit, when compared to other declining energy sources.
- It provides the ability to generate electrical outputs 24 hours a day, 7 days a week over a long period of time.
- Support in planning policy terms exists at the local, regional and national level.



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## 3 THE PROPOSED DEVELOPMENT SITE

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### 3.1 Site Location and Land Ownership

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- 3.1.1 The site falls entirely within the jurisdiction of Staffordshire County Council and Staffordshire Moorlands District Council.
- 3.1.2 The site is located on land within the curtilage of Three Nooks Farm, Horton, Leek, Staffordshire, ST13 8QT (grid ref: E391507 N357890).
- 3.1.3 The farm is owned by Mr Roger Ball, and is currently managed as a working dairy farm with a 150 strong dairy herd. The farm is accessed from C173 Top Road/Lask Edge Road via an existing concrete driveway.
- 3.1.4 Existing buildings comprise the farmhouse (a two-storey detached dwelling), and several sheds and barns used as milking parlours and for equipment storage. The main agricultural barn at the farm is in excess of 50 years old and is approaching the end of its useful life.
- 3.1.5 A silage clamp used by the farmer for storage of winter feed for the dairy herd is located adjacent to the northern wall of the shed; this is retained by a raised earthwork bank and is kept secure by polythene sheeting weighted down by used tyres.
- 3.1.6 **Figure 1** depicts the location of the site and the surrounding area. Photographs of the site and the wider locality are depicted on **Figure 2**.
- 3.1.7 The applicant has entered into lease agreements with the owner of Three Nooks Farm, and notices have been served informing the landowner of this planning application.

### 3.2 Overview of the Existing Environment

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#### Settlement and Transport

- 3.2.1 The site is located on a transition point between the parishes of Biddulph and Horton, and is set primarily within open agricultural land approximately 2km west of Horton village and immediately east of Biddulph Moor village.
- 3.2.2 Biddulph Moor is a medium sized village with facilities including a school, shops and post office. The village core has become surrounded over time by modern housing estates comprising detached and semi-detached dwellings.
- 3.2.3 Rural areas surrounding the site and village are interspersed with isolated farm dwellings, outbuildings and residential properties, many of which are generally accessed via farm tracks off the local road network.
- 3.2.4 The nearest residential dwellings to the site are: Three Nooks Farmhouse (approx. 50m south); Wellfield Farm and Poolside Farm (approx. 280m to the north-west); Sprinks Farm (approx. 375m to the east); Catt Hayes Farm (approx. 420m to the south-east); Lask Edge Farm (approx. 350m to the south); Croft Meadows (approx. 460m to the south-east); and Thorn Tree Farm (approx. 510m to the south-west).
- 3.2.5 Key transport routes providing connectivity to the site from the surrounding area comprise: Top Road; Lask Edge Road; Leek Lane; Crowborough Road; Hot Lane; Rudyard Road; and New Street.

### **Topography**

- 3.2.6 The site and village of Biddulph Moor are positioned at the top of an open moorland ridge at around 300m AOD.
- 3.2.7 The local topography drops sharply to the east of the site towards Horton Brook, which flows at the base of Horton Valley at approximately 165m AOD.

### **Geology, Hydrology and Contamination**

- 3.2.8 The underlying geology of the local area is of Lower Carboniferous (Dinantian) age. To the west, the area is bound by the Lask Edge Fault and to the east by the Pennines.
- 3.2.9 1:50000 geological mapping and Environment Agency (EA) records indicates the bedrock at Three Nooks Farm and to the north and west is predominantly formed by Minn Sandstones with superficial deposits of Devensian Till. Mudstone, siltstone and sandstone from the Morridge Formation are recorded immediately south and east of the farm, which are designated as 'Secondary A' aquifers (defined as permeable strata capable of supporting local water supplies). Superficial Diamicton Till deposits are also present; these are designated as 'Unproductive' strata.
- 3.2.10 EA data relating to areas at risk of flooding confirms that the site is not located in an area defined as either a Flood Zone 2 or 3, and that no historic records exist of flooding at the site.
- 3.2.11 EA records indicate there to be no contaminated land (special sites) within 2km of the site, and interrogation of their National Incident Recording System database indicates no spillage incidents have been recorded within the last 2 years.
- 3.2.12 The site and wider surroundings are designated a surface water Nitrate Vulnerable Zone, and a Groundwater Source Protection Zone III exists north of the site. EA data confirms two water abstraction licenses are held within 2km of the site, both relating to surface water abstractions at Biddulph Brook and one of its unnamed tributaries.
- 3.2.13 Land drains east of Three Nooks Farm channel water down the valley into Horton Brook, approximately 2km east of the site. Land to the west of the farm drains towards Leek Lane and continues south before collecting in the Head of Trent in Crowborough, approximately 1km south-west of the site.
- 3.2.14 An agricultural run-off pond (slurry lagoon) is located within the curtilage of Three Nooks Farm.

### **Soils**

- 3.2.15 DEFRA published Agricultural Land Classification (ALC) mapping indicates the site to be positioned centrally within a large tract of Grade 4 ALC land, stretching between Congleton to Stoke-on-Trent (north-south) and Leek to Kidsgrove (east-west).
- 3.2.16 ALC Grade 4 land is not considered in planning policy terms to warrant protection from development, given it is not 'best and most versatile' agricultural land.
- 3.2.17 Published soil information from the National Soil Map confirms the site is positioned on the interface of two different soil units, specifically: 'slowly permeable seasonally wet acid loamy and clayey soils' and 'slowly permeable wet very acid upland soils with a peaty surface'. Both units are characterised as being of low to very low fertility with impeded drainage.

### **Landscape and Visual**

- 3.2.18 The site is located in the North Staffordshire Green Belt and within a designated Special Landscape Area. It is positioned in an area of open countryside within a distinct local landscape, set within the Gritstone Uplands landscape character type within the wider Potteries and Churnet Valley regional character area.
- 3.2.19 Key characteristics of the local area comprise: small steep sided valleys; broadleaved woodland; gritstone walls; pasture farming; and hedgerows with hedgerow trees. A significant proportion of landscape features within and adjacent to the site form boundary features, which are visibly in decline.
- 3.2.20 The site is located <250m west of Sprinks Wood, a semi-natural ancient woodland (grid ref: SJ922578). The nearest designated landscape comprises Biddulph Grange Country Park - a C19<sup>th</sup> National Trust Victorian garden - located approximately 1.5km north-west of the site.
- 3.2.21 Visually, a limited number of residential dwellings overlook the site. The site does feature in more distant views available from the eastern side of Horton Valley; however a combination of intervening vegetation and landform profiles filter and screen views to a degree.

### **Access**

- 3.2.22 A network of Public Rights of Way (PRoW) exists to south and south-east of the site. A number of footpaths are also located west of the site around the eastern fringes of Biddulph Moor village. These footpaths provide connectivity and linkage between various isolated farmhouses set within the wider landscape and the local road network.
- 3.2.23 A single PRoW (Horton 21) between Top Road and Catt Hayes Farm crosses the site in a north-west to south-easterly direction.

### **Cultural Heritage**

- 3.2.24 Published archaeology and heritage records indicate no World Heritage Sites, Scheduled Monuments or Registered Battlefields lie within or in proximity to the site.
- 3.2.25 Biddulph Grange Conservation Area is located some 1.5km north-west of the site.
- 3.2.26 Interrogation of Staffordshire's Historic Environment Record (HER) reveals no known undesignated archaeological remains within the site. A series of post-medieval bloomery sites are recorded north-east of the site near to Taylor's Barn Farm and Porter's Farm, over 1km distance from the site. Evidence of ridge and furrow medieval activity is also recorded near Taylor's Barn Farm. Such evidence indicates the site holds limited potential for undiscovered archaeological remains to be present.
- 3.2.27 SMDC identifies the site as being positioned within a defined area of historic landscape character<sup>2</sup> exhibiting high evidential/historic value and medium aesthetic/communal value. The site partially falls within 18<sup>th</sup> and 19<sup>th</sup> century planned field systems enclosed by a mix of stone walls and mature hedgerows. Although these have been subject to change during the 20th century (with some boundaries being removed), their historic character remains legible. The study also identifies Wellfield Farm and Thorn Tree Farm as surviving historic farmsteads.

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<sup>2</sup> Historic Environment Character Assessment: Staffordshire Moorlands (August 2010) – BBHECZ 12

### Ecology

- 3.2.28 The site is not designated as an area of ecological interest. The majority of the site and its immediate surroundings comprise improved and semi-improved grassland (grazed) bordered by hedgerows of low ecological value, with a number of small wooded streams present.
- 3.2.29 Ecological records obtained in 2012 identified the following protected species within 2km of the site: badgers; 24x bat records (the majority being Pipistrelle species) – all over 1km distance from the site; and 40x Biodiversity Action Plan (BAP) bird species (inc. 10x notable species).
- 3.2.30 In terms of other species, 1x record of Common toad, 2x records of Brown hare, 3x records of hedgehog are recorded in 2km of the site.
- 3.2.31 Several plant species of note are also recorded within 2km of the site, some of which are protected or are afforded BAP status.

### Noise

- 3.2.32 The site is located within a Campaign to Protect Rural England (CPRE) defined 'Tranquil Area', and is acknowledged to be an exceptionally quiet area during both daytime and night-time periods.
- 3.2.33 A number of farms, residential dwellings and PRoWs lie in proximity to the site. Other sensitive receptors in the locality comprise: Moor County First School (approx. 865m to the north-west); Hot Lane Recreational Ground (approx. 810m to the north-west); New Road Methodist Church (approx. 750m to the north-west); and a tourist/religious retreat at Croft Meadows Farm (approx. 460m to the south-east).

### Air Quality

- 3.2.34 A review of the latest (2010) NETCEN<sup>3</sup> estimated background concentrations of Nitrogen Dioxide (NO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) at a grid point closest to the centre of Three Nooks Farm (391500, 357500) indicates levels of 11.79µg m<sup>-3</sup> and 16.03µg m<sup>-3</sup> respectively. Both estimates are significantly less than the Air Quality Strategy objective of 40µg m<sup>-3</sup>.
- 3.2.35 A review of available monitoring data from 2008 suggests that current and predicted air quality within the district is good, with none of the current monitoring locations exceeding, or predicted to exceed, the annual mean objective.
- 3.2.36 No Air Quality Management Areas (AQMAs) have been declared at or in the vicinity of the site.

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<sup>3</sup> <http://uk-air.defra.gov.uk/>

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## 4 PROJECT DEVELOPMENT AND CONSULTATION

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### 4.1 Shell UK Limited

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- 4.1.1 Shell UK Limited (Shell) originally drilled two boreholes at Three Nooks Farm in the 1980s, as part of an exploration for oil. Both wells were drilled from the same cellar approximately 12 inches apart. Nooks Farm 1 was drilled to a depth of some 3620ft (1103m) and Nooks Farm 1A to approximately 2050ft (624m) deep.
- 4.1.2 Whilst drilling Nooks Farm 1, Shell passed through gas bearing sands (Onecote Sands) at a depth of between 450m and 550m from the surface. Tests on the gas flows confirmed substantial reserves of gas around the well at this target zone.
- 4.1.3 As sufficient infrastructure was unavailable at that time to economically export the amount of gas encountered, both wells were plugged with cement to prevent the escape of fluids (or gases) and abandoned in 1983/1984.

### 4.2 Seven Star Natural Gas Limited

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- 4.2.1 Following several failed attempts by Independent Energy UK to obtain planning permission to develop an on-site gas field at Three Nooks Farm during the 1990s, Seven Star Natural Gas Limited began work in 2006 to develop a proposal to undertake drilling of a natural gas exploration borehole and well, and erection of associated plant and equipment.
- 4.2.2 The site was selected by the applicant due to the following important factors.
- Its position on the crest of a known anticline in the geological strata and other known geological information.
  - Existing PEDL arrangements and proven gas reserves capable of exploitation over a long period of time.
  - Its remote setting, and distance from environmental sensitivities and residential dwellings.
  - The availability of existing buildings that could be utilised to house electricity generating equipment.
  - Limited landtake requirements and close proximity to local electricity grid connections.
  - The willingness of the landowner to accommodate the development.
- 4.2.3 For the purposes of progressing the project through planning, the applicant split the project into two distinct phases, each with separate planning applications.
- Phase 1 comprises drilling, testing and appraisal of quantities of underground gas on land at Three Nooks Farm.
  - Phase 2 comprises the installation of equipment at Three Nooks Farm to generate electricity from the underground gas reserves.
- 4.2.4 The principal objective of the project is to harness existing underground natural gas reserves at the farm, for the purpose of generating electricity on-site and exporting this to the National Grid.

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### 4.3 Phase 1

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- 4.3.1 The applicant submitted a planning application to SCC in mid 2010, and was subsequently granted planning consent (ref: SM.10/06/161 M) in February 2011 to undertake Phase 1 of the works (i.e. 12 hour drilling and gas testing at one of two existing boreholes at the site).
- 4.3.2 Shortly after the granting of consent and prior to the commencement of any works, site inspections undertaken by the applicant revealed that both boreholes were leaking, and allowing underground gas to leak into the atmosphere. The gas was tested and confirmed to be the same composition as that discovered by Shell in the 1980s, indicating that the gas was from the original reservoir and that the previous well abandonment had in some way failed allowing it to reach the surface.
- 4.3.3 Discussions with SCC and the Health and Safety Executive (HSE) concluded a need to agree and implement an action plan to repair the boreholes and make the area safe as soon as practicable. Accordingly, the applicant submitted a second planning application (ref: SM.11/18/161 M) to SCC on 21st December 2011; this application detailed the proposed action plan and also covered all gas appraisal and testing works.
- 4.3.4 The Phase 1 works were granted permission by way of planning committee decision on 5<sup>th</sup> April 2012, and are currently in the process of being implemented on site by the applicant.
- 4.3.5 The approved Phase 1 works involve the following site operations.
- **Preparatory and Enabling Works** - comprising: installation of signage; installation of root protection measures; undertaking tree works; improvements to the existing entrance and driveway to Three Nooks Farm; installation of fencing; formation of a site compound and field access track; formation and demarcation of car parking and laydown areas; and installation of wheel wash facilities.
  - **Drilling and Repair Works** - comprising: erection of a drill rig, flare stack and ancillary equipment (e.g. cabins and containers) within the site compound; 24 hour operation of the rig to drill out and repair both existing boreholes; importation of materials and consumables to site; recycling and disposal of waste off-site; gas testing, appraisal and flaring; and installation of a wellhead valve.
  - **Site Demobilisation and Restoration** - comprising: strip down of the drill rig and removal (including all ancillary equipment); site restoration; field access track reduction; removal of root protection measures; and implementation of a 5 year landscape management plan.

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### 4.4 Phase 2

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#### Design Concept

- 4.4.1 The development of a potential design concept for Phase 2 began during the pre-application stages for Phase 1, as both stages are intrinsically linked.
- 4.4.2 An indicative Phase 2 plan was submitted by the applicant as part of the original Phase 1 application (ref: SM.10/06/161 M), the purpose being to provide SCC with an understanding of the wider development aspiration for the site beyond that which consent was being sought. The indicative layout proposed the following infrastructure.

- Installation of an underground gas pipeline connection between the wellhead valve (installed as part of the Phase 1 works) and an existing agricultural barn at Three Nooks Farm.
- Upgrading of the existing agricultural barn to house all required gas processing and electrical generating equipment.
- Installation of an 11kV underground electrical cable connection, potentially running from the existing farm building along the farm driveway and south along C173 Top Road / Lask Edge Road (assuming connection into an existing electrical overhead cable at the junction with Crowborough Road at Lask Edge).

4.4.3 Following submission of SM.10/06/161 M, the applicant reviewed the basic parameters of this indicative layout in order to progress the design from the conceptual stage to a more detailed configuration.

#### **Design Development: Agricultural Barn and Generating Equipment**

4.4.4 A review was undertaken of the existing agricultural barn to determine its suitability for upgrading, in order to accommodate both the equipment for the proposed scheme and the farmer's dairy herd.

4.4.5 The existing barn is large and of steel-framed construction with a corrugated asbestos roof. Its walls are constructed from a mixture of breezeblock, timber and metal. Discussions with the farmer and site surveys concluded that the existing barn was some 50 years old and neither of suitable construction or condition to meet both sets of requirements; therefore it was determined that the project would need to allow for the demolition and erection of a new purpose-built agricultural barn on a broadly similar footprint to the existing structure.

4.4.6 The barn would need to be shared between the applicant and the farmer. The applicant's electricity generating plant, associated switchgear and controls would need to be located within the western side of the barn (approx. 35%), in order to allow the farmer ease of access for his dairy herd between the remainder of the barn (approx. 65%) and the adjacent grazing fields.

4.4.7 It was identified that some of the plant would need to be sited externally of the barn due to space restrictions, and to meet operational and maintenance requirements. As the position of this equipment conflicted with the location of the farmer's existing silage clamp, it was agreed with the farmer that the clamp would be repositioned behind this equipment and the new barn, set in a purpose built area enclosed by precast concrete retaining walls.

#### **Design Development: Electrical Cable Route**

4.4.8 An 11kV electricity cable connection will be required as part of the project in order to connect the generating equipment within the barn to the local electricity network.

4.4.9 A decision was made early in the design process to connect the proposed scheme to the local electricity network via an underground cable, in order to avoid visual impacts typically associated with the installation of new overhead electrical transmission infrastructure (pylons).

4.4.10 Liaison between the applicant and the DNO commenced in mid 2011. A potential connection at Rock End was initially identified as an alternative to connecting at Crowborough Road at Lask Edge, requiring a cable to be buried along the existing highway network via Lask Edge Road and Crowborough Road.

- 4.4.11 Continued discussions with the DNO and landowners subsequently identified a closer, potentially more suitable connection point at Biddulph Moor in proximity to an existing electrical substation at the junction of Farmside Lane and Ridgefields (see **Figure 3**).
- 4.4.12 Subject to DNO confirmation, any underground connection to this location will likely either:
- Track the local highway network from the farm driveway south along C173 Top Road / Lask Edge Road, then west along Leek Lane, then north up Wraggs Lane and then north-east onto Farmside Lane; or
  - Cross C173 Top Road / Lask Edge Road and traverse agricultural land towards Hockadilla Farm east of Biddulph Moor, and then interface with Farmside Lane.
- 4.4.13 A final decision on the exact route of the cable will be made by the DNO, and only subject to the granting of planning consent for the proposed scheme.
- 4.4.14 Accordingly, matters associated with the underground electricity cable connection have not been considered as part of this planning application. These will be the responsibility of the DNO to undertake and implement a future date, under permitted development rights afforded to it as a statutory undertaker.

## **4.5 Pre-Application Consultation**

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### **Stakeholder Engagement**

- 4.5.1 As part of Phase 2 of the project, the applicant has undertaken pre-application consultation with a range of consultees, stakeholders and landowners in order to: establish whether the principle of the proposed could be acceptable; inform the development of the scheme design; identify potential utility connections; assist in the identification of constraints, opportunities, sensitivities and potential environmental issues; and to establish information requirements for the planning application.
- 4.5.2 The outcomes of discussions and meetings with local councillors, residents and council officers during preparation and determination of the Phase 1 planning applications (ref: SM.10/06/161 M and SM.11/18/161 M) have also been used to inform development of the proposed scheme and identification of environmental matters requiring consideration.

### **Staffordshire County Council**

- 4.5.3 RSK Environment Ltd prepared and submitted information concerning Phase 2 of the project to SCC in September 2011. The purpose of this exercise was to provide SCC with an outline of the Phase 2 works (as developed up to that point), and a summary of what planning and environmental aspects the applicant considered may need to be covered in any subsequent planning application.
- 4.5.4 SCC consulted with its internal departments, and provided written feedback to the applicant in October and November 2011. Key issues noted were as follows.
- **Ecology:** A need to undertake a Phase 1 Habitat Survey, extended to cover all land with 30m of the gas pipeline (including assessment of field boundary features); and a need for bat and bird surveys of the existing agricultural barn.
  - **Forestry:** A need to undertake non-statutory consultation with the Forestry Commission as the proposal is located within 250m of Sprinks Wood, a semi-natural ancient woodland.



- **Landscape:** Recommendations that the new barn be of similar design and height to the existing structure to minimise visual impact; recommendations on external colours and finishes to the new barn; and the intention of SCC to seek a contribution from the applicant towards furthering landscape policy objectives.
- **Highways and Access:** No obstructions to be caused to Horton 21 PRoW during construction; a requirement to follow national guidance for any Transport Assessment undertaken; and a requirement to consider routes and junctions if abnormal loads are required.
- **Noise:** No further information required over and above that submitted, but recommended a visit to an operational site be undertaken to validate the report's assumptions.
- **Planning:** Considered that the main issues noted adequately addressed the concerns of local residents raised during consultation on Phase 1 of the project.

4.5.5 Following receipt of feedback, discussions continued with SCC's environmental officers to refine and agree the scope and coverage of landscape, visual and ecological surveys, the outcomes of which are summarised in **Section 6** of this Statement.

4.5.6 **Appendix 1** contains copies of SCC's responses and discussion records for Phase 2 of the project.

#### **Statutory and Non-Statutory Organisations**

4.5.7 RSK Environment Ltd consulted a range of statutory and non-statutory organisations on the proposed scheme in late January 2012. This took the form of written pre-application consultation requesting environmental information within 2km of the site, and also sought comment on the outline proposals.

4.5.8 Summaries of the responses are provided below.

- **Environment Agency (EA):** The EA confirmed that: watercourses in the area are 'ordinary watercourses'; the site is not located within any identified Flood Zone and has not been subject to historic flooding; there are no groundwater sites in or near to the site; the area is underlain by solid geology of the Morridge Formation, designated a 'Secondary A' aquifer; a groundwater Source Protection Zone III exists north of the site; the local area is designated a surface water Nitrate Vulnerable Zone; no 'Special Sites' are located within 2km of the site; and there are two current licensed water abstraction licences within 2km of the site.
- **Natural England (NE):** NE confirmed that the following local sites within 2km of the site: Troughstone Hill; The Sprink; Cliff Wood; Cliff Wood (east of) and Shirkley Wood. NE confirmed the following ancient woodland inventory sites: Cliff Wood; Shirkley Wood; Heath Hey Wood; Spring Wood; and an unnamed woodland near Sprinks Farm. NE directed the applicant to Staffordshire Ecological Record for details of local species and habitats.
- **Staffordshire Ecological Record (SEB):** Provided information on nature conservation sites, records for European and UK protected species, and species noted in the UK BAP (short list) and Staffordshire BAP.

- **Staffordshire Moorlands District Council (SMDC):** Did not pass comment or opinion regarding the proposed Phase 2 works in their response, but provided comments specifically in relation to the Phase 1 application which was under determination by SCC at the time of issuing their response.
- **Forestry Commission:** The Forestry Commission provided no consultation response.

4.5.9 English Heritage was not included in the written consultation exercise, given that SCC had already confirmed an absence of archaeological or historic assets within and surrounding the site.

4.5.10 Copies of the full consultee responses are contained in **Appendix 2**. The various responses and information strands from this consultation exercise were subsequently taken into account in the preparation of this planning application.

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## 5 THE PROPOSED SCHEME

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### 5.1 Site Boundary and Layout

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- 5.1.1 **Figure 4** depicts the red-line planning application boundary, and also depicts the blue-line boundary delineating all land within the applicant's ownership and/or control. The application boundary covers all land required to construct and accommodate the proposed scheme, and totals 19902m<sup>2</sup> (or 1.9902ha) of land.
- 5.1.2 A number of principles have influenced the final form and extent of both the application boundary and the design of the proposed scheme.
- Spatial allowances to meet the minimum engineering and operational requirements of the project, and the farmer's farming and storage requirements.
  - Utilisation of the existing farm entrance and driveway off C173 Top Road / Lask Edge Road, for both construction and operational access.
  - Utilisation of an appropriate haul route from major roads for construction traffic, as agreed during Phase 1 of the project.
  - Utilisation of existing areas of hardstanding within the farm curtilage to provide temporary laydown areas and vehicle parking during the construction phase.
  - Allowances to provide adequate separation distances between the site and environmental sensitivities (e.g. boundary vegetation).
  - Avoidance of localised environmental impacts where possible, and reduction of impacts through development, agreement and inclusion of appropriate mitigation measures.
  - Feedback received during pre-application consultation.

### 5.2 Proposed Scheme Design and Key Components

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#### Barn

- 5.2.1 A purpose built barn of approximate dimensions 33.97m length x 25.62m depth x 8.477m height (to ridgeline from lowest ground level) will be erected on the site of the existing agricultural barn (to be demolished).
- 5.2.2 The design of the new barn is shown in **Figures 5, 6a** and **6b**, and reflects the operational requirements of the proposed scheme, minimum space requirements for the farmer's dairy herd and implement storage, and stakeholder comments regarding to its final form, appearance and external finish.
- 5.2.3 The total footprint of the barn will be approximately 870m<sup>2</sup>; some 617m<sup>2</sup> of which will be set aside for the farmer.
- 5.2.4 The lower sections of the barn walls will be constructed of exposed concrete blockwork to a maximum height of 1.9m (from lowest ground level). Upper sections will be formed around a steel frame and infilled with Yorkshire boarding. The western side of the barn will also incorporate an internal acoustic concrete block wall inside, clad with Yorkshire boarding to assist with noise attenuation.

- 5.2.5 The roof of the barn will form a ridge and will be constructed of profile metal sheeting, finished in 'anthracite' (dark grey) colour to assist visual integration into the local surroundings. The roof angle will be set at 10 degrees, with the peak of the apex set at 309.5m AOD.
- 5.2.6 A number of exhausts, stacks and grills (finished in black) will be incorporated into the gable wall and roof to provide adequate ventilation for the generating equipment. All rainwater goods will be of deepflow profile, finished in black, and all exposed frame steelwork will be galvanised with a natural weather finish.
- 5.2.7 The applicant's energy centre within the barn will contain the following.
- An acoustic engine cell housing the power generating equipment, comprising two internal combustion gas engines enclosed within acoustically controlled container units.
  - Two generator exhaust stacks.
  - Inlet louvers to provide adequate ventilation to the barn and equipment.
  - High voltage and low voltage switchrooms, comprising all switchgear and controls.
  - A small workshop / control room for operational personnel.
  - Welfare facilities (kitchen and washroom) for operational personnel.
- 5.2.8 The final choice of generating equipment has yet to be decided by the applicant; however it is likely that CAT generators (or similar) will be utilised. The generating set will comprise two internal combustion gas engines, each capable of generating up to a maximum 2MWe (Mega Watts) of electrical power.
- 5.2.9 Each engine will be located in an acoustic container, similar to a steel road container, and supplied by its own gas compressor and control gear. Only one engine will be operational at any given time; the other engine will serve to act as a backup generator in the event that the first unit is not operational.
- 5.2.10 The generating equipment will be accessed by two metal engine access doors of approximate dimensions 3.51m x 3.49m on the western elevation of the barn. A smaller double timber door will form the main entrance to the applicant's side of the barn.
- 5.2.11 Aside from the engine access and personnel doors, the only visible external protrusion will be the generator exhaust pipes that will protrude through the barn roof. The final height of the pipes will be subject to detailed design calculations, but are likely to extend to around 1m above the ridge.
- 5.2.12 The eastern side of the barn will comprise an open area for cattle housing and a small internal storage area for housing agricultural implements, equipment and animal feed. This section of the barn will be fitted out by the farmer to suit his operational requirements.
- 5.2.13 Both the north and south elevations will be accessible by either a single or double side door, finished in 'Hammerite' (Silvery Grey) colour or similar.

### External Plant and Equipment

5.2.14 There will be a requirement to site the following plant outside the new barn.

- Gas processing equipment.
- Fan cooled radiators.
- Electrical transformers.
- Pipework and cable ducting.

5.2.15 All external equipment is shown on **Figure 5**; this will be located within areas currently used by the farmer for the storage of silage. The equipment will be securely contained by a 2.4m high chainlink fence, finished in black. The total footprint of the external equipment area will be approximately 225m<sup>2</sup>.

### Silage Clamp

5.2.16 The position of the existing silage clamp will be relocated to the rear of the new barn and associated external plant. This is shown on **Figures 6a, 6b, 7 and 8**.

5.2.17 The new clamp has been designed to meet the requirements of The Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) Regulations 2010 in respect of handling and storage of silage, and control of effluent.

5.2.18 The clamp area will cover approximately 1058m<sup>2</sup> and will be contained by precast concrete panel walls and steel columns to securely hold the silage in place. A safety rail will also be installed on top of the clamp walls.

5.2.19 Modifications will be undertaken to an earthwork bank located along the northern edge of the existing clamp and existing farmyard levels to achieve flat ground. The new clamp will be split into two sections to permit the farmer flexibility in silage management (i.e. separate storage of two cuts per year), and will be directly accessible by tractor from the farmyard.

5.2.20 A strip drain will be installed at the entrance of the new clamp to route silage water runoff to a new underground septic tank, which in turn will be connected to the existing farm slurry lagoon.

### Gas Pipeline Connection

5.2.21 A new underground gas pipe will be installed to connect the wellhead (to be installed as part of the consented Phase 1 works) and the externally sited gas processing equipment, as shown on **Figures 4 and 5**.

5.2.22 The valves installed at the wellhead will provide the facility to control and isolate the gas supply at source; these will generally be contained within the cellar below ground level. The buried pipeline will run between the wellhead and the new silage clamp, and will enter the new external equipment compound north of the clamp.

5.2.23 Due to the pressure of gas within the well, this pipe will be constructed of steel and will be approximately 300m in length, of diameter no greater than 150mm, and buried to an approximate depth of 0.75m.

### Utility and Other Connections

- 5.2.24 Preliminary details of the required electricity cable connection are provided in **Section 4** of this Statement, and are depicted on **Figure 3**. The cable is required to provide connectivity between the proposed generation equipment within the new barn and the local electricity distribution network.
- 5.2.25 The local telecommunications operator will install new broadband, telecommunications and CCTV connections at the site; this will provide the applicant with a means of remotely monitoring the equipment and security operations at the site from their headquarters.
- 5.2.26 Seven Trent Water will install a connection to the new barn, in order to supply water to the welfare facilities within the structure. Surface and foul water will be handled via a new septic tank drainage system, to be installed by the applicant.
- 5.2.27 The applicant will install several underground pre-insulated heating pipes from the new equipment to the farmhouse and dairy; these will function to transfer heat from the generators to the property and provide the dwelling with a direct heating and hot water supply.
- 5.2.28 As the responsibility for major utility connections lies under the relevant operators and statutory undertakers, matters relating to the installation of such connections have not been considered in this planning application.

### 5.3 Construction Routes, Access and Parking

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#### Construction Route

- 5.3.1 The applicant presented a vehicle route to Staffordshire County Council as part of consented planning applications SM.10/06/161 M and SM.11/18/161 M, the purpose being to agree an appropriate route for construction and maintenance traffic to use during implementation of the Phase 1 works.
- 5.3.2 This agreed route is shown on **Figure 9** and was formalised in both applications via the applicant entering into a Section 106 Legal Agreement with SCC.
- 5.3.3 The applicant proposes to use this same primary route for construction traffic during the implementation of the Phase 2 proposals at the site, given it has previously been accepted by SCC's highways officers and planning officers as appropriate for construction vehicles of the type proposed.
- 5.3.4 Vehicles will travel from the A50 on the A527 (Tunstall Road) towards Knypersley. In Knypersley, vehicles will then turn right on to Park Lane. At Rock End, vehicles will bear left on to New Street towards Biddulph Moor and will leave Biddulph Moor on Rudyard Road. They will then turn right onto Top Road / Lask Edge Road, and then turn left into the site entrance at the farm.
- 5.3.5 This route will be displayed within the site, and all drivers will be instructed by the applicant to use it.

#### Site Access

- 5.3.6 Construction vehicles will access the site via the existing farm driveway off Top Road / Lask Edge Road. The existing farm entrance and driveway were upgraded in March 2012 to take HGVs and construction vehicles as part of a consented improvements package detailed in SM.10/06/161 M and SM.11/18/161 M.

### **Car Parking and Laydown Areas**

- 5.3.7 Construction workers and site personnel will park their vehicles in a dedicated car parking area within the site compound. This area is located opposite the existing slurry lagoon and will accommodate up to 7 vehicles, as shown in **Figure 4**.
- 5.3.8 During the preparatory and enabling works, vehicles will temporarily park in front of the farmhouse to allow plant and machinery full access across the site (see **Figure 4**). This area is currently surfaced in concrete and is used for occasional parking by the farmer, his family and visitors.
- 5.3.9 Post completion of these works, small sections of the farmyard and base of the new barn will be used as a temporary laydown area for materials transported to/from the site throughout the construction period.

## **5.4 Preparatory and Enabling Works**

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### **Public Rights of Way**

- 5.4.1 The applicant will erect warning signs to indicate the location of the PROW crossing the farm (Horton 21).
- 5.4.2 Proposed signage details are depicted in **Figure 10**; these will be positioned at either side of existing stiles in order to clearly indicate the location of the footpath, and will comprise arrows pointing in both directions. Warning signs will also be displayed to advise staff of crossing walkers who may be travelling along the pathway.
- 5.4.3 Access along highways and public footpaths will then be maintained throughout the construction period, and temporary or permanent diversions will be necessary.

### **Tree Works and Root Protection Measures**

- 5.4.4 A detailed tree survey was undertaken in August 2011 as part of application ref: SM.11/18/161 M in order to identify and catalogue trees at the farm. This followed best-practice as identified in BS5837:2005 Trees in Relation to Construction.
- 5.4.5 This survey has been reviewed against the form and extent of the proposed scheme, and updated to indicate where it will be necessary to provide tree protection fencing to avoid damage during the construction period.
- 5.4.6 The survey findings and requirements for protection are depicted on **Figure 11**. Root protection areas will be established using HERAS type fencing, with all panels interlinked and fully clamped.
- 5.4.7 In relation to field trees, the majority form part of the hedgerow boundary to the field within which the wellhead valve will be installed under SM.11/18/161 M, primarily to the south and eastern edge. Most have been given a value B, indicating these as trees of moderate quality and value.
- 5.4.8 A total of seven trees have been identified adjacent to the existing driveway and farmyard. Only one of these - Tree No. 6 - has a value B; other trees are either young or in poor condition. While the root protection area extends over the track, no protection will be necessary on the basis that the trunks are within the field and are protected by existing boundary fencing and the roots have developed under the existing concrete track. The low branches of this tree that overhang the farm driveway have already been removed as part of works undertaken for SM.11/18/161 M.

- 5.4.9 The survey confirmed that no trees will require removal ahead of implementing the proposed works.
- 5.4.10 Although field hedgerows are outside the British Standard, those in close proximity to the works will be protected with a line of orange plastic mesh fencing supported on road pins.
- 5.4.11 Tree and hedge protection fencing to the field will be installed prior to any access/work by construction traffic. Root protection measures will take around 2 days to implement at the site, with protective equipment being brought to site by flatbed lorry.

#### **Fencing**

- 5.4.12 HERAS type block and mesh fencing will be installed around the existing field hedges and trees to protect them from damage during the proposed works, and will also be installed around construction areas to provide site security.
- 5.4.13 HERAS fencing will be of panel dimensions 3.5m wide and 2m high. It is expected that this fencing will be delivered to the site by flatbed lorry at the same time as the tree protection equipment.

#### **Wheel Wash**

- 5.4.14 To control dust, dirt and debris being tracked by construction vehicles, wheel wash facilities will be set up and provided within the farmyard by means of a power washer. This will be used to clean the wheels and undersides of vehicles prior to departure from the site.
- 5.4.15 The location of these facilities will be within the farmyard, as shown on **Figure 4**.

#### **Demolition Works**

- 5.4.16 Demolition works will be undertaken to take down and remove the existing agricultural barn. Key activities associated with this operation will include the following.
- Clearing out and removal of all existing equipment within the barn for storage elsewhere at the farm.
  - Removal of the existing steel frame and profile sheeting.
  - The grubbing up (excavation) of the floor of the existing barn, and areas of the existing farmyard where new equipment and infrastructure will be installed.
- 5.4.17 The structure will be taken down using a combination of hand tools and possibly a crane to remove upper sections. The dismantled components will then either be stored elsewhere on the farm, or will be removed from site by lorry.

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### **5.5 Construction Operations and Site Activity**

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#### **Compound Setup**

- 5.5.1 A temporary site compound will be formed to provide equipment storage and basic welfare facilities for staff and construction operatives.
- 5.5.2 The site compound will be located opposite the existing farm slurry lagoon (see **Figure 4**), the formation of which will involve the use of excavators and vibrating rollers to form a suitable base, and delivery of welfare cabins via articulated lorry.



**Earthworks**

- 5.5.3 Excavation earthworks will be undertaken using a combination of excavators and dumpers to achieve the necessary ground levels for the new barn, silage clamp and external equipment.
- 5.5.4 Essential drainage infrastructure will also be delivered by lorry and installed during this stage of operations.

**Groundworks**

- 5.5.5 Groundworks will be necessary at the site to prepare suitable bases for the new barn, external equipment and silage clamp.
- 5.5.6 A reinforced concrete slab and footings will be constructed and laid to form the base of the barn, upon which the main structure will be positioned and erected. Concrete will also be laid to form a suitable base of the silage clamp. Concrete pads will be formed and laid to provide suitable bases for the external plant and equipment. Stone will also be laid, where necessary.
- 5.5.7 As part of the groundworks, a linear trench will be excavated between the installed wellhead and the new barn to facilitate installation of the underground gas pipe. Excavated earth will be temporarily stored adjacent to the trench, and then used to backfill the trench post installation of the pipe.
- 5.5.8 The groundworks phase will involve deliveries of raw materials to the site by both 12tn and 20tn lorry.

**Assembly of Barn and Silage Clamp (External Finishes)**

- 5.5.9 The silage clamp will be installed ahead of the barn as the farmer will require storage facilities to be in place by mid May 2013; this will be undertaken in parallel with other earthworks and groundworks being undertaken elsewhere at the site.
- 5.5.10 Sections of steel framework for the new barn and silage clamp will be delivered to the site and installed on the concrete bases using a crane and suitable access equipment.
- 5.5.11 Precast wall panels will be delivered to the site and installed within the steel framework of the silage clamp. Due to the size and weight of the panels, erection will be undertaken with the use of a crane.
- 5.5.12 Post erection of the framework, blockwork will be delivered and laid to both infill the frame of the new barn and to form equipment / working areas and rooms. Timber cladding brought to site will be installed to form the external façades. The barn will then be topped by sections of sheet roofing, followed by the fitting of all access doors.
- 5.5.13 Deliveries of materials during this phase will be via articulated, 20tn and 12tn vehicles.

**Internal Finishes**

- 5.5.14 The interior of the new barn will be fitted out to meet both operational and basic welfare requirements.

- 5.5.15 Within the applicant's section of the new barn, toilet and kitchen facilities will be installed and connected to the installed drainage regime. Office equipment will also be installed during this phase, with rooms fitted out with doors and decorated as appropriate. Internal strip lighting will be installed to provide illumination of the equipment rooms and containers.
- 5.5.16 Within the farmer's section of the new barn, a series of cattle stalls will be installed to meet his requirements.
- 5.5.17 Equipment and materials associated with the internal finishing stage will be delivered to the site mainly in vans, with larger materials brought to site in 12tn and 20tn lorry as necessary.

#### **Equipment Installation and Commissioning**

- 5.5.18 A combination of articulated and rigid 20tn and 12tn lorries and small vans will be used to deliver the various generation plant and equipment to the site. Equipment including transformers, generation sets, and control units will be assembled and installed within and outside the new barn.
- 5.5.19 Fencing will also be installed to provide adequate security and protection for externally sited equipment such as the radiators and transformers.
- 5.5.20 Connections will be made between the underground gas pipeline and the generating equipment, and heat supply pipework will be installed to provide heating to the adjacent dairy and farmhouse.
- 5.5.21 During this phase, the DNO will install an 11kV underground connection between the site and the local electricity distribution network.
- 5.5.22 Following installation, all plant and equipment will be commissioned and subject to thorough testing.

### **5.6 Construction Management**

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#### **Materials and Consumables**

- 5.6.1 Water required for construction operations will be provided via a pipe in the farmyard that has natural water flow.
- 5.6.2 Fuels, oils and other similar consumables will be retained in a double bunded store within the farmyard.
- 5.6.3 Bulk construction materials (e.g. sand and cement) will be delivered to site via a combination of HGV and small lorry, and will either be mixed on site or be delivered ready-mixed.

#### **Waste**

- 5.6.4 The control and management of waste will be undertaken in accordance with a dedicated Site Waste Management Plan (SWMP); this will be developed before the start of works and will set out how building materials, and resulting waste, are to be managed.
- 5.6.5 The main sources of waste material will be generated from: the demolition of the existing barn; excavation of the existing concrete base of the barn; and excavation of areas of concrete on the existing farmyard in locations where new plant and equipment will be installed.

- 5.6.6 Waste arising from the demolition of the barn will be placed directly into a 12 tonne covered skip within the site for removal. Crushed stone and rubble recovered from the excavation of the existing concrete base of the barn and farmyard will be reused as fill elsewhere at the site, where appropriate.
- 5.6.7 One 12 tonne skip would be on site at any one time during the proposed works to accommodate the arisings. Once full, this skip will be transported off-site to a registered disposal facility and an empty skip brought back to the site.
- 5.6.8 In addition, there will be four 8 tonne skips on site which will be used for recycling, segregation and dispose of general waste material (e.g. plastics, cardboard etc).
- 5.6.9 All wheel wash water will drain from the farmyard and into the existing slurry lagoon.
- 5.6.10 Based on the above information, an outline SWMP has been developed for inclusion in this application (see **Appendix 3**). Subject to the granting of planning consent, this will be used as the basic framework for developing a SWMP for the proposed works.

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## **5.7 Site Demobilisation**

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- 5.7.1 Following completion of the construction works, the site will be cleared of all vehicles, plant and equipment as part of site demobilisation.
- 5.7.2 The site compound will be removed, and all disturbed areas of the farmyard tidied. As a final operation, any temporary fencing installed to protect trees will be taken down and removed from site.

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## **5.8 Site Restoration, Landscaping and Aftercare**

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- 5.8.1 A detailed 5-year site restoration, landscaping and aftercare plan has already been developed for implementation as part of the consented Phase 1 works under SM.11/18/161 M, and comprises a series of short-term restoration measures specific to that phase of works and wider long-term strategies such as targeted planting and management of trees and shrubs around the farm holding.
- 5.8.2 In relation to the Phase 2 works, additional earthworks and landscaping proposals have been developed to improve long term integration into the local environment, and to provide a degree of visual screening of the new barn, equipment and silage clamp in available views along Horton 21 PRoW and from elevated properties located north-west of the farm.
- 5.8.3 Circa 860m<sup>2</sup> of landscaping will be planted as part of the proposed scheme. It is considered that the provision of additional landscaping will make a positive contribution to both furthering local landscape policy objectives and enhancing local landscape character.
- 5.8.4 Soil handling, restoration and aftercare, and landscaping strategies are depicted on **Figures 12, 13 and 14**.
- 5.8.5 Wider site restoration will be undertaken following the completion of site works associated with the consented Phase 1 works, with the Phase 2 landscaping implemented in the first available planting season after completion of the proposed works.

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**5.9 Operational Security and Maintenance**

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- 5.9.1 Post completion of the construction works, there will be no requirement for persons to access the site, save for those carrying out periodic maintenance or visiting the site for other reasons. Such visits are expected to be made by motor car or light van every few weeks.
- 5.9.2 24 hour security will be provided by an infra-red security alarm system and CCTV linked to the applicant's central control room. This type of technology has been proven on other similar developments to deter entry into sites of this nature.
- 5.9.3 All sensitive plant will be securely locked and contained in the new barn, with all gas pipelines and other utility infrastructure buried to deter security breaches. Metal mesh fencing will provide the necessary security around external apparatus.
- 5.9.4 The nature of the proposed operations is such that the underground gas will be piped from the wellhead to equipment within the new barn for immediate conversion to electricity. No gas will be stored at the site.

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**5.10 Operational Lifespan**

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- 5.10.1 Based on estimates of the volume of underground gas reserves, the applicant believes the proposed scheme will be able to generate electricity for approximately 20 years post construction.

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**5.11 Project Programme and Timescales**

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- 5.11.1 A high-level indicative programme for the proposed works is provided below.
- 5.11.2 The programme is predicated on the assumption that this planning application constitutes an application that will be referred to SCC's planning committee for determination.
- 5.11.3 For completeness, the programme depicts the anticipated durations associated with the implementation and completion of the consented Phase 1 works (inc. site restoration and landscaping), and timescales associated with the planning and determination process.

Proposed Works: Estimated Timescales	2012							2013										
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Implementation of consented Phase 1 borehole repair works and gas appraisal works	█	█	█	█	█	█												
Submission and determination of Phase 2 planning application		█	█	█	█													
Approval of Phase 2 planning application by planning committee and release of permission					█	█												
Discharge of any pre-commencement planning conditions imposed by SCC						█	█	█										
Preparatory and Enabling Works (inc Demolition).											█	█						
Compound Setup											█							
Earthworks											█	█	█					
Groundworks											█	█	█	█				
Assembly of Silage Clamp and Barn (External Finishes)											█	█		█	█			
Internal Finishes																█		
Equipment Installation and Commissioning																█	█	█
Site Demobilisation																		█
Site Restoration, Landscaping and Aftercare.																		

- Legend:
- = Phase 1: Implementation of Consented Operations
  - = Phase 2: Planning and Determination
  - = Phase 2: Construction and Implementation of Planned Operations

**Table 5.1: Indicative Programme of Works**

5.11.4 The main works requiring consent under this application are programmed to commence in April 2013 through to December 2013 (i.e. a total of circa 36 weeks). Commencement of site operations in April 2013 is necessary to avoid inclement winter weather, and to ensure the works do not conflict with agricultural practices at the farm.

5.11.5 Indicative timescales associated with the above operations and phases are presented below in summary form.

- Preparatory and Enabling Works (inc. demolition): 6 weeks from early April through to mid May.
- Compound Setup: 2 weeks in early April.
- Earthworks: 2 weeks in early May and 2 weeks in mid June.
- Groundworks: 8 weeks from mid May to early July.
- Assembly of Silage Clamp and Barn (External Finishes): 4 weeks in late April through to mid May, and 8 weeks from early July through to mid August.
- Internal Finishes: 4 weeks from late August to mid September.
- Equipment Installation and Commissioning: 12 weeks from late August to mid November.
- Site Demobilisation: 3 weeks from mid November to early December.
- Site Restoration, Landscaping and Aftercare: 2 weeks in early December.

5.11.6 The above operations are planned to be undertaken over a 6 day week (Mon – Sat) across a 12 hour working period during daylight hours, with no working on Sundays and Bank Holidays.

## 5.12 Vehicle Types and Movements

5.12.1 Based on the above schedule of operations and programmed timescales, it is estimated that implementation of the proposed scheme will involve the following vehicle movements (i.e. both directions) and vehicle types.

Activity	Vehicle Types and Movements			
	Articulated	Up to 20tn Lorry	Up to 12tn Lorry	Vans and Cars
Preparatory and Enabling Works (inc Demolition):	0	20	36	150
Compound Setup:	8	10	4	120
Earthworks:	6	6	12	120
Groundworks:	0	390	36	180
Assembly of Barn and Silage Clamp (External Finishes):	128	48	26	684
Internal Finishes:	0	8	8	240
Equipment Installation and Commissioning:	0	26	10	240

Activity	Vehicle Types and Movements			
	Articulated	Up to 20tn Lorry	Up to 12tn Lorry	Vans and Cars
Site Demobilisation:	8	10	8	120
Site Restoration, Landscaping and Aftercare:	0	0	14	36

**Table 5.2: Estimated Vehicle Types and Movements**

5.12.2 Assuming a 36 week working period, the following total and averaged two-way vehicle movements have been estimated.

- Articulated Vehicles: 150 total | 5 per week | 0.8 per day.
- Up to 20tn Lorries: 518 total | 14 per week | 2.4 per day.
- Up to 12tn Lorries: 154 total | 4 per week | 0.7 per day.
- Cars and Vans: 1890 total | 53 per week | 8.8 per day.

5.12.3 Local residents will be kept informed of the timing of deliveries of equipment and materials to ensure that their safety – and that of other road users – is not compromised, and to minimise disruption on the local road network.

5.12.4 The majority of construction movements to and from the site will be timed to avoid school drop off and collection times.

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## 6 ENVIRONMENTAL IMPACTS

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### 6.1 Environmental Impact Assessment

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- 6.1.1 A review of the proposed works has been made against the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. It is considered that the proposed works fall within the description provided in Schedule 2 paragraph 2(e) and 3(a) of these regulations, as they exceed the indicative 0.5ha threshold.
- 6.1.2 Following a review of the potential interactions between the proposed scheme and known environmental sensitivities, the applicant has concluded that the project would not give rise to any significant environmental effects due to its nature, size and location.
- 6.1.3 Accordingly the applicant contends that formal EIA is not required for the proposed works, and that an Environmental Statement is not necessary as part of the planning application. SCC will review this conclusion when it undertakes its own screening opinion of the proposed scheme, post submission and validation of this planning application.

### 6.2 Design and Access Statement

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- 6.2.1 A Design and Access Statement has been prepared for the proposed scheme. This explains the design principles and concepts that have been applied to the proposal, specifically the amount, layout, scale, landscaping and appearance of the development.
- 6.2.2 The Design and Access Statement forms part of the planning application documentation, and also details how context of the receiving environment has informed the design of the proposed scheme.

### 6.3 Scoping Review

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- 6.3.1 A preliminary scoping exercise was undertaken in September 2011 to identify those matters potentially requiring detailed consideration in the planning application.
- 6.3.2 The review specifically considered: the likely form and nature of the proposed scheme; known environmental sensitivities and their relationship to the proposals; and key issues associated with previous planning applications at the site.
- 6.3.3 Scoping initially confirmed that the key environmental issues surrounding the proposals would potentially centre on: noise impacts; landscape and visual impacts; ecological impacts; traffic and transport impacts; and the relationship to planning policy.
- 6.3.4 The process of scoping continued throughout the early stages of proposal development alongside pre-application consultation discussions; this resulted in a number of environmental topics (outlined below) being reviewed and subsequently discounted from the detailed assessment.
- 6.3.5 In addition, it was considered that traffic and transport matters previously identified as requiring detailed consideration would no longer require assessment, for reasons set out below.



### **Traffic and Transport**

- 6.3.6 Statements regarding traffic and transport matters are set out in **Section 5**, which details: predicted vehicle movements, types and sizes associated with proposed scheme construction and operation; proposed car parking; vehicle access to/from the local road network; ProW access and signage provision; non-motorised user routes; and existing planning permissions at the site.
- 6.3.7 Considerable highway entrance and driveway improvements have recently been implemented at Three Nooks Farm as part of the consented Phase 1 works (see photography in **Figure 2**). These improvements were necessary to ensure that HGVs and other construction vehicles – similar to the type to be used during Phase 2 – can safely access the site.
- 6.3.8 A review of the various scheme components has indicated these will not require or involve any abnormal loads to or from the site during construction, and that average daily vehicle movements to and from the site will be relatively low and temporary during this period.
- 6.3.9 Traffic entering and leaving the site once operational will be limited to occasional maintenance and inspection journeys. It is therefore not expected that local disruption will occur to existing traffic movements or journeys.
- 6.3.10 An appropriate highway route suitable for HGVs (and smaller vehicles) has been defined and agreed as part of Phase 1; the applicant proposes to utilise this for implementation of the Phase 2 operations. As the principle of using this route has already been tested by the planning process and established as acceptable, no further assessment of the suitability of the local highway network is considered necessary.
- 6.3.11 As the proposed scheme will not result in long-term significant effects on the operation of the transport network, it was determined that a detailed Transportation Assessment would not be required to support the planning application in this instance.

### **Archaeology and Cultural Heritage**

- 6.3.12 Consultation with SCC and a review of existing information concluded there to be no known archaeological or heritage assets within the site, or in proximity to it.
- 6.3.13 Based on this and the nature of planned construction activities, it is considered that very limited potential exists to interact with (and therefore impact upon) known assets, or to encounter undiscovered buried remains during the works.
- 6.3.14 Accordingly, no significant impacts on archaeology are predicted to occur on historic assets through construction of the proposals.

### **Geology and Hydrology**

- 6.3.15 Consultation with the Environment Agency confirmed there to be no risk of flooding at the site, and the nature of the proposed scheme will neither result in changes to existing drainage regimes or the opening of pollution pathways to groundwater.
- 6.3.16 No water will be extracted from aquifers as part of the construction process. Best practice site management and pollution prevention techniques (e.g. bunding of oil stores) will be employed to ensure no pollution to surface and/or groundwater occurs during construction.

- 6.3.17 Provisions have been made within the design of the proposed scheme to control and manage operational surface and foul water drainage at the site; this will be achieved through the installation of a septic tank and strip drains which will connect to the farmer's existing slurry lagoon.
- 6.3.18 No significant impacts are therefore predicted from proposal implementation in relation to geological and hydrological resources.

#### **Land Use**

- 6.3.19 The proposed scheme will principally involve demolition of an existing barn and erection of a new barn and installation of ancillary external equipment on a broadly comparable footprint. Subject to appropriate programming and timing of these activities, there will be no long-term disruption or changes to existing farm operations.
- 6.3.20 Any disruption to agricultural land within Three Nooks Farm associated with the installation of a gas connection between the new equipment and the wellhead will be temporary, and all land will be fully reinstated to its original condition to ensure future agricultural viability is not irrevocably compromised.
- 6.3.21 External ancillary equipment adjacent to the new barn will be sited on an area of hardstanding currently used for the storage of silage. Provision has been made in the application for a new silage clamp (and associated drainage) as part of the overall design of the proposed scheme, which will constitute a considerable improvement over the current feed storage arrangements.
- 6.3.22 No agricultural grazing land will be permanently taken through the introduction of the proposed scheme.
- 6.3.23 Post identification of a suitable underground electrical connection route, wayleaves/easements will be agreed with landowners and the local authority to permit the DNO future access to land that their cables may cross.
- 6.3.24 Accordingly, not significant impacts are predicted in respect of land use interests and activities from the proposed scheme.

#### **Socio-Economics**

- 6.3.25 Construction of the proposed scheme will be of short duration, and hence any disruption will be temporary and controlled.
- 6.3.26 Efforts have already been made during implementation of Phase 1 of the project to secure equipment, supplies and raw materials from local sources. The principle of using local resources will be transferred to Phase 2, and the applicant will also engage in a competitive tendering process to secure suitably qualified, locally based contractors to undertake the construction works.
- 6.3.27 It is expected that, on average, a 5 to 15 strong workforce will be on site during the construction phase at any one time, reducing to occasional maintenance and inspection visits during the operational phase.
- 6.3.28 Construction will therefore not place significant or onerous demands on local services, employment or infrastructure, but will likely induce short-term benefits in the area in terms of expenditure in the local economy.

### **Air Quality**

- 6.3.29 Small amounts of dust during the demolition and construction phases will be generated; however these will be temporary and of short duration. Apart from Three Nooks Farmhouse and Horton 21 PRoW, all other dust sensitive receptors are either located at distances beyond 250m from the site or are not located downwind (north east) of the prevailing wind direction (south west). Such receptors are therefore unlikely to experience dust related nuisance or annoyance under normal meteorological conditions.
- 6.3.30 Best practice construction management methods and measures will be employed to limit and control dust at source during the construction phase; this will include the use of water bowsers, sprays, wheel wash facilities and road sweepers where necessary. In the event of a significant offsite dust occurrence, all dust generating operations will be temporarily halted until such times as the site conditions and/or prevailing weather conditions improve, or where appropriate remedial action can be taken to prevent any further occurrence.
- 6.3.31 The operational phase will not generate any significant volumes of dust but will result in airborne emissions; these will be odourless, colourless and limited to exhaust emissions associated with the process of gas combustion.
- 6.3.32 Operational emissions will comprise small amounts of water vapour, carbon dioxide, carbon monoxide and NO<sub>x</sub>. As the dispersion of emissions can be affected by surrounding buildings, the gas engine exhausts will be positioned above the roofline of the new barn to ensure sufficient wind dispersal away from adjacent buildings and nearby receptors.
- 6.3.33 Odour has not been found to be an issue with developments of the type proposed, and no odour problems have been encountered at similar operational sites run elsewhere in the UK. All plant and equipment will be maintained to meet relevant emission limits and operating standards.
- 6.3.34 Accordingly, no significant impacts on local air quality or human health are predicted to occur from either the construction or operation of the proposed scheme.

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## **6.4 Noise**

### **Background**

- 6.4.1 Scoping concluded a need to give detailed consideration to potential noise impacts by way of baseline monitoring and predictive modelling.
- 6.4.2 The purpose of the assessment has been to identify any increase in noise during daytime/night-time periods over ambient noise levels, and the tonal characteristics and output levels of noise emitted by equipment used during operational phase of the proposed scheme.

### **Scope of the Assessment**

- 6.4.3 In order to establish an up to date representative noise baseline, the applicant commissioned Kirby Charles Associates to undertake an independent noise survey and feasibility assessment at the site in June 2011. This was submitted to SCC for information purposes in September 2011, and also included an assessment of the proposals based on a preliminary design.

- 6.4.4 Following development and refinement of the proposed scheme in 2012, a number of significant changes were made to the preliminary design and layout configuration, resulting in a need to revisit this assessment. Accordingly, RSK Environment Ltd has undertaken a new assessment based on the final design of the proposals and operational regimes, referencing the baseline data gathered in June 2011 by Kirby Charles Associates.
- 6.4.5 Focus has been directed in the assessment towards the identification of potential noise increases associated with the operation of the containerised generator plant, externally sited ancillary equipment and exhaust stacks.
- 6.4.6 Noise predictions have been calculated using CadnaA noise-modeling software.
- 6.4.7 In order to validate the conclusions of this assessment, noise levels of similar equipment currently operating at a similar site operated by Greenpark Energy Limited at Houghton Main (South Yorkshire) have been used. Operational monitoring data was gathered on the 26<sup>th</sup> June 2012 by Bruce Smith (Acoustic Associates) on behalf of Alkane Energy UK Limited, and is presented in **Appendix 6**.

#### **Noise Standards and Guidelines**

- 6.4.8 The National Planning Policy Framework gives guidance to local authorities on the use of planning powers to minimise adverse noise impacts from development.
- 6.4.9 In relation to noise from industrial and commercial developments the likelihood of complaints about noise from industrial development can be assessed, where the Standard is appropriate, using guidance in BS4142.
- 6.4.10 Tonal or impulsive characteristics of the noise are likely to increase the scope for complaints and this is taken into account by the “rating level” defined in BS4142. This rating level should be used when stipulating the level of noise that can be permitted. The likelihood of complaints is indicated by the difference between the noise from the development (expressed in terms of the rating level) and the existing background noise level.
- 6.4.11 The Standard indicates that a difference of around 10 dB or higher indicates that complaints are likely, and a difference of around 5 dB is of marginal significance.
- 6.4.12 BS 4142 references two indices:
- **L90** - the level of noise exceeded for 90% of the measurement period, this is known as the background noise level, and
  - **Leq**, i.e. the equivalent continuous noise level, which is the steady noise level that contains the same amount of energy over a specific time period as that in a fluctuating sound. This level can be A-weighted (LAeq) in order to account for the sensitivity of the human ear.
- 6.4.13 The assessment procedure contained in BS4142 compares the noise from a fixed installation, using the Leq index corrected for tonal components etc., with the background noise level for the area (i.e. the L90 index). If the corrected noise from the proposals is +10 dB or more above the background noise level this is a positive indication that complaints would be likely, whilst a difference of -10 dB would be a positive indication that complaints would be unlikely. Differences of +5 dB are of marginal significance.
- 6.4.14 BS4142 states that the method is not suitable for assessing the noise inside buildings or when the background and rating noise levels are both very low. For the purposes of the standard, background noise levels below about 30 dB and rating levels below about 35 dB are considered to be very low.

- 6.4.15 BS8233 indicates that for gardens and balconies etc, it is desirable that the steady noise level does not exceed 50 dB LAeq<sub>T</sub> and 55 dB LAeq<sub>T</sub> should be regarded as the upper limit. An indication of the design target for indoor ambient noise levels is reproduced from the Standard in Table 6.1 below.

**Table 6.1: Indoor ambient noise levels in spaces when they are unoccupied**

Criterion	Typical Situation	Design Range LA <sub>eqT</sub> dB	
		Good	Reasonable
Reasonable resting/sleeping conditions	Living rooms	30	40
	Bedrooms*	30	35
* For a reasonable standard in bedrooms at night, individual noise events (measured with F time-weighting) should not normally exceed 45 dB L <sub>Amax</sub> .			

- 6.4.16 BS8233 states that the level of sound reduction that can be actuated via an open window is between 10-15 dB. Therefore, the external targets at the façade of a residential building in order to meet the 'Good' and 'Reasonable' design range for sleeping conditions are between 40-45 dB and 45-50 dB respectively.

#### Assessment Assumptions

- 6.4.17 The assessment has been based on the following design assumptions.
- Extraction of ground gas from a previously drilled borehole via underground pipe.
  - Installation of two containerised CAT 2.0 MWe generators, with only one generator operating 24 hours a day 7 days a week at any given time, and contained within one half of a new barn at Three Nooks Farm.
  - Generator radiators and associated plant and equipment sited external to the farm building.
  - Noise from the generator exhaust stack will be limited to an appropriate level forming part of the generator package (discussed in the mitigation section below).
  - A construction specification of the new barn, based on details presented in **Section 5**.
- 6.4.18 Specifications for the proposed plant and equipment referenced in the assessment are presented in **Appendix 7**.
- 6.4.19 As an involved party in the project, the owner of Three Nooks Farm would not be considered within a BS4142 Assessment; however in order to protect the amenity of residents of the property, an assessment to BS8233 internal noise targets has been undertaken.

#### Noise Monitoring and the Existing Noise Climate

- 6.4.20 Monitoring was carried out at Three Nooks Farm by Kirby Charles Associates from 20.20 hrs on Monday 20th June 2011 to 03.10 hrs on Tuesday 21st June 2011. The noise monitor was positioned adjacent to Lask Edge Farmhouse at the Leek Lane / Lask Edge Road junction; this location was selected because it would give a representative indication of the general noise climate of the local area (excluding any working farm noise).
- 6.4.21 Monitoring was undertaken using a Cirrus Type CR811B Precision (Type 1) Integrating/Logging Sound Level Meter, and was calibrated before and after the monitoring periods using a Cirrus Type CR511E Calibrator, which complies with IEC 942. No drift in calibration was observed.

- 6.4.22 The microphone was positioned 1.5m above ground level and equipped with a windshield. Noise monitoring was undertaken when the weather conditions satisfied the requirements of BS4142: 1997, i.e. mean wind speed less than 5m/s and no significant rainfall. Wind speeds were recorded using an anemometer. Personnel were present throughout the monitoring periods to ensure an accurate representation of the prevailing noise climate was recorded.
- 6.4.23 Monitoring results indicate that the lowest night-time noise climate is typically 37 dB LAeq<sub>5min</sub> and 27 dB LA90<sub>5min</sub>. Full noise survey results for Three Nooks Farm are presented in **Appendix 8**.

#### Receptor Locations

- 6.4.24 The assessment has considered the worst-case night-time noise impact of the proposed scheme on a selection of residential receptors in the area, comprising the following locations presented in Table 6.2 (height of receptor based on whether residence is a bungalow or a property with upper storey floors).

**Table 6.2: Residential Receptors**

ID	Name	Height of receptor point	Coordinates	
			x	y
R1	Dales Close	4.5	390831.0	357973.6
R2	Leek Lane	4.5	391020.3	357673.6
R3	Poolside Farm	4.5	391347.9	358155.6
R4	Wellfield Farm	4.5	391388.2	358164.9
R5	Lask Edge Farm	4.5	391428.0	357543.0
R6	Three Nooks Farm	4.5	391511.5	357853.6
R7	Catt Hayes Farm	1.5	391868.9	357575.2
R8	Croft Meadows	4.5	392101.6	357935.1

- 6.4.25 Receptor locations in relation to the site are presented in **Figure 15**. Details of the modeling, including assumptions based on equipment data, are provided in **Appendix 9**.

#### Predicted Impacts and Mitigation

- 6.4.26 Noise predictions have been calculated based on the layout presented in **Figure 16**.
- 6.4.27 Table 6.3 below presents the results of a BS4142 assessment utilising a +5 dB correction on plant noise levels at receptor points to account for tonality of equipment. The rating noise level contours are presented graphically on **Figure 17**.

**Table 6.3: BS4142 Assessment**

ID	Name	Background Noise Level (LA90, dB)	Predicted Noise Level (dB)	Rating Noise Level	Difference with background
R1	Dales Close	27	22	27	0
R2	Leek Lane	27	23	28	+1
R3	Poolside Farm	27	30	35	+8
R4	Wellfield Farm	27	30	35	+8
R5	Lask Edge Farm	27	30	35	+8
R7	Catt Hayes Farm	27	21	26	-1
R8	Croft Meadows	27	17	22	-5

- 6.4.28 The modeling results indicate that predicted rating noise levels at residences surrounding Three Nooks Farm would be, at most, 35 dBA.
- 6.4.29 As both the background and rating level are considered very low in accordance with BS4142, the results have been assessed (including the residence of Three Nooks Farm) and compared with criteria within BS8233. The results of this assessment are presented in Table 6.4 below; the predictions of internal noise consider attenuation of noise through an open window of 10 dB.

**Table 6.4: Assessment of internal noise levels in relation to BS8233 internal noise criteria**

ID	Name	Predicted Noise Levels at Receptor		BS8233 Criteria Limits		Difference between noise level and limits	
		External	Internal	Garden Limit	Internal Limit	Garden Limit	Internal Limit
R1	Dales Close	22	12	55	35	-33	-23
R2	Leek Lane	23	13	55	35	-32	-22
R3	Poolside Farm	30	20	55	35	-25	-15
R4	Wellfield Farm	30	20	55	35	-25	-15
R5	Lask Edge Farm	30	20	55	35	-25	-15
R6	Three Nooks Farm	45	35	55	35	-10	0
R7	Catt Hayes Farm	21	11	55	35	-34	-24
R8	Croft Meadows	17	7	55	35	-38	-28

- 6.4.30 The results show that predicted noise levels at receptors surrounding the site will be substantially below BS8233 criteria limits for internal noise levels. Noise levels predicted at the residential building of Three Nooks Farm would be within the BS8233 internal target level for 'Reasonable' conditions.
- 6.4.31 In order that noise from the generator exhaust stack does not contribute to noise at residents surrounding the site (therefore preventing rating noise levels increasing over 35 dBA) the package will be designed such that the noise level 1m from the opening of the stack does not exceed 68 dB(A). The detail of how this maximum limit was ascertained is presented in **Appendix 9**.

### Conclusions

- 6.4.32 Noise levels associated with the operation of the proposed scheme are not predicted to exceed industrial noise or residential amenity criteria at residences surrounding the site. It is not considered that noise levels predicted at Three Nooks Farm would result in disturbance to the residential amenity of occupiers therein.
- 6.4.33 A maximum noise limit of 68 dB(A) will be applied to noise 1m from the opening of the generator exhaust stack. If this cannot be achieved as designed, a silencer providing the necessary sound reduction will be required in order that noise levels do not exceed industrial or residential amenity criteria at residential receptors.

## 6.5 Landscape and Visual Impacts

### Background

- 6.5.1 Scoping concluded a need to consider the potential landscape and visual impacts of the proposed scheme.

6.5.2 The purpose of the appraisal is to identify and evaluate the potential change in the composition and structure of the existing landscape and the degree of visual change that would result from construction and operation of the proposed scheme at the site.

#### **Scope of the Assessment**

6.5.3 Experienced landscape architects within RSK Environment Ltd discussed and agreed a scope for the assessment with Staffordshire County Council's landscape officer between October 2011 and February 2012. Discussions were informed by the preparation of a series of indicative layout plans, sections, elevations and aerial photographs of the proposed scheme and local area.

6.5.4 It was agreed that the assessment:

- Should follow best practice methodologies, as detailed in "Guidelines for Landscape and Visual Impact Assessment (2<sup>nd</sup> Edition)" (GLVIA), published by the Landscape Institute and the IEMA (2002).
- Should identify and describe the key features, components and characteristics within and surrounding the site that contribute to the quality and perception of the local landscape, and any potential for effects (both adverse and beneficial) on existing resources and/or local character.
- Should consider potential visual effects that may arise from publically accessible locations and nearby residential dwellings. Three locations - Poolside Farm/Wellside Farm, Lask Edge Farm, and Catt Hayes Farm/Horton 21 PRow - were considered appropriate to consider as representative viewpoints.
- Would require details of the size, elevation and finish of the new barn to be included.

6.5.5 Comments were also passed by SCC regarding the height and finish of the new barn, in terms of achieving a degree of visual improvement over that associated with the appearance of the existing barn.

#### **Assessment Methodology and Criteria**

6.5.6 GLVIA acknowledges the relationship between the perception of landscape character areas (i.e. where aspects such as landform, hydrology, vegetation, landcover, land use pattern, and cultural features combine to create homogenous character areas or units), and the experience of receptors (i.e. residents, people in their workplace, users of recreational facilities etc).

6.5.7 The assessment has been informed by a combination of desk based and site based appraisal techniques, and professional judgement. Site survey work was undertaken in March 2012; this is a time of year where existing vegetation is not in full leaf, and thus visual exposure of the site is greater than in summer months.

#### *Sensitivity to Change*

6.5.8 Landscape sensitivity relates to the stability of the existing landscape, its vulnerability towards change, and tolerance to accept change resulting from the type of development proposed.

6.5.9 Visual sensitivity considers the nature, location and existing visual context of the receptor.

6.5.10 Sensitivity to change has been rated on a three point scale of High – Medium – Low.



### *Magnitude of Impact*

- 6.5.11 Magnitude of impact in landscape terms considers the extent to which the proposed scheme would emerge as a new component in the landscape and change the balance between components that currently constitute existing character.
- 6.5.12 Magnitude of impact in visual terms considers the extent to which the proposed scheme would modify the existing outlook.
- 6.5.13 Magnitude of impact has been rated on a four point scale of High – Medium – Low – No Change.

### *Significance of Effect*

- 6.5.14 The significance of the effect on identified landscape character and visual receptors has been assessed by considering the sensitivity to change and the magnitude of impact predicted to occur, taking into account any proposed mitigation (e.g. landscaping).
- 6.5.15 Significance is represented using a descriptive scale descending from substantial - moderate - slight and adverse through neutral to an ascending scale of slight - moderate - substantial and beneficial.
- 6.5.16 Assessments have been undertaken and reported for: the construction phase (to account for temporary activity within the landscape); upon completion of construction (when the degree of visual exposure is potentially greatest); and summer 15 years hence (to enable account to be taken of the effectiveness of landscape measures that establish and mature over time).

## **Baseline Environment**

### *Designated and Protected Features*

- 6.5.17 The following designations and protected features relating to landscape interests are associated with the site and surrounding environment, the boundaries of which are depicted in **Figure 18**.
- Special Landscape Area: The site is located entirely within a Special Landscape Area, designated in recognition of the special character and qualities of the landscape of north-east Staffordshire.
  - Green Belt: The site is located entirely within Green Belt, designated to safeguard the countryside from encroachment and inappropriate development.
  - Ancient Semi-Natural Woodland: The site is located approximately <250m north-west of Sprinks Wood, a designated ancient semi-natural woodland listed on the Staffordshire Inventory of Ancient Woodland (provisional) (1993).
- 6.5.18 In addition to the above, a network of PRoWs exists to the south-east of the site and east of Biddulph Moor village. The most significant route is Horton 21 ProW which crosses Three Nooks Farm.

### *Landscape Character*

- 6.5.19 As part of a study into landscape change, SCC undertook and published a landscape character assessment<sup>4</sup> of the county. A review of the study indicates that the proposed development site is located entirely within the Potteries and Churnet Valley regional character area, and is classified under the Gritstone Uplands character type. Character areas and types are depicted in **Figure 18**.
- 6.5.20 The key characteristics of the Gritstone Upland landscape type considered relevant to the proposed development site and local area comprise: upland ridge landform with small steep side valleys; extensive areas of broadleaved woodland; small steep sunken lanes; gritstone walls and stone dwellings; pasture farming; hedgerows and hedgerow trees; extensive views; large farms; and many individual residential properties.
- 6.5.21 The study records that introduction of fencing for stock control, large farm buildings and inappropriate urbanisation of commuter dwellings has led to incongruous features emerging within this landscape type. The study also notes that character and quality are limited by virtue of the relatively poor survival of semi-natural vegetation, the loss of characteristic landscape features, and the poor condition of those features that remain.
- 6.5.22 As part of their Local Development Framework, a more recent study of the local landscape was undertaken by SMDC<sup>5</sup>. Appraisal of the local landscape context reveals that the site and immediate surroundings are characterised by isolated dwellings and agricultural farmsteads set on a local road network positioned on an elevated ridgeline.
- 6.5.23 The character is dominated by pastoral activity in and around the Horton Valley, set against the elevated moorland ridge of Lask Edge that physically and visually divides the more urbanised landscape of Biddulph Moor west of the site. Buildings comprise a mixture of traditional stone dwellings and those of modern brick construction. The relative tranquility and remoteness of the area contribute to the attractiveness and perception of the local landscape.
- 6.5.24 Notwithstanding this, it is apparent that some of the character-forming features and components that contribute to local landscape character are in poor or deteriorating condition, which influences overall landscape quality and value. It is also apparent that many sections of hedgerow (particularly hawthorn, elder and holly) that define field boundaries around the site are infrequently managed and gappy in places. A number of visually detracting features – not least two tall and visually prominent telecommunications masts nearby – exert a negative influence on the appreciation of local landscape character.
- 6.5.25 Taking account of the above factors and presence of planning designations that seek to protect local character and openness, the landscape associated with the site and immediate surroundings is considered to be of medium to high sensitivity.

### *Visual Environment*

- 6.5.26 A validation check to ascertain potential visibility of the site was undertaken from a number of publically accessible locations and linear routes in proximity to the site, and from further afield within the Horton Valley.

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4 Planning for Landscape Change: Supplementary Planning Guidance to the Staffordshire and Stoke on Trent Structure Plan, 1996 – 2011 (adopted 2001).

5 Landscape and Settlement Character Assessment of Staffordshire Moorlands (2010).

- 6.5.27 The exercise concluded that Three Nooks Farm forms a very inconspicuous feature in views from across the valley (see photography in **Figure 2**), and that the changes associated with the proposed scheme would not be readily discernable in the mid to long distance outlook. Accordingly, views from the Horton Valley were not considered further in the visual assessment.
- 6.5.28 Existing relationships between the site and identified visual receptors are described below, the locations of which are shown on **Figure 19**. A series of panoramic photographs from each location are depicted in **Figure 20a and 20b**; the latter includes photography from three additional locations which were visited as part of the site validation exercise, but which were not subject to detailed appraisal.

#### Wellfield Farm / Poolside Farm

- 6.5.29 Wellfield Farm and Poolside Farm comprise two adjacent properties positioned on Top Road to the north-west of the site.
- 6.5.30 Wellfield Farm is a two storey building with frontage windows oriented due south across the landscape, partially filtered by dense planting within the property curtilage adjacent to the entrance. Poolside Farm comprises a single storey building with ground floor windows oriented east towards the side of Wellfield Farm. The property also has attic rooms with roof windows of similar orientation, and a gable end window facing south.
- 6.5.31 The existing outlook from both properties is one where elements such as boundary planting, barns and other structures such as garages form the principal focus in foreground. Views are obtainable from the ground floor of Wellside Farm across the wider agricultural landscape towards the communications mast at Moortop and the general locality of Three Nooks Farm, the latter being well contained and screened in the outlook by a combination of gently undulating landform and vegetation. The entrance and driveway to Three Nooks Farm are discernable in the mid distance, as are the upper roof sections of the farmhouse.
- 6.5.32 Upper floor views from Wellside Farm offer views of a similar context, but with reduced screening in the foreground.
- 6.5.33 The outlook from these properties is generally attractive with a strong horizon line towards the skyline, but which is marred slightly by discernable traffic movements along Top Road and several distinctive vertical elements such as post and rail fencing and telegraph poles in the middle distance which detract from the overall quality of the view.
- 6.5.34 Taking into account the nature and composition of the existing view, and the orientation of the dwellings, residential occupants at this location are considered to be of medium sensitivity towards change.

#### Lask Edge Farm

- 6.5.35 Lask Edge Farm is located south of Three Nooks Farm and is set on the junction of Top Road, Lask Edge Road and Leek Lane. The dwelling is a bungalow with roof windows, the frontage of which is oriented to the east. The property also has a gable end window in the roof which offers views to the north west.
- 6.5.36 The outlook from the ground floor is one which is partially filtered by a line of young coniferous planting within the property curtilage directly fronting the windows, and to the north by further planting along the boundary with Leek Lane.

- 6.5.37 Where offered, east facing frontage views take in the agriculturally managed landscapes and extend beyond the junction across the valley towards Horton in the background. Mature trees and boundary features form a key focus in the outlook in this direction, occasionally breaking the skyline.
- 6.5.38 Oblique views from the gable end towards Three Nooks Farm are permitted; these take in many of the farm buildings and rooflines as a relatively small component in the outlook. The landscape pattern is relatively intact in places, and contributes to the quality of the view from this location. Rails Farm, which contrasts strongly against the horizon in the distance, forms a principal point of focus. The angle of view is such that limited appreciation is offered of Horton Valley, but which does permit appreciation of the urban fringe of Biddulph Moor.
- 6.5.39 The overall context of the view is one which is open and generally devoid of visual detractors, but which is screened in part by private landscaping around the property. Where elevated views are permitted, these are generally directed at an angle away from Three Nooks Farm but remain expansive in nature.
- 6.5.40 Accordingly, visual receptors at this location are considered to be of medium to high sensitivity to change.

#### Catt Hayes Farm / Horton 21 PRoW

- 6.5.41 Catt Hayes Farm is set within a series of gentle folds in the landscape associated with the western slopes of the Horton Valley. It is positioned south east of Three Nooks Farm and immediately adjacent to Horton 21 PRoW.
- 6.5.42 Views from this bungalow are restricted to ground level, with main windows of one of the principal rooms offering an outlook towards the north west. The curtilage of the property also contains a detached single storey garage/storage structure which features strongly in the view.
- 6.5.43 The undulating landform associated with the valley slopes forms a key characteristic in available views from both the property and the footpath, occasionally broken by lines of deciduous hedgerows and hedgerow trees. Appreciation of Three Nooks Farm in the middle distance is offered to residential occupants; the view accommodating the eastern sides of the existing agricultural barn, an adjacent barn, and the fringes of the slurry lagoon.
- 6.5.44 The roofline of Wellfield Farm is perceptible against the skyline at distance, as are the many telegraph poles which break the horizon. Woodland to the west of Sprinks Farm located further down the valley partially frames the outlook to the north, with oblique views offered across the Horton Valley to the east. Such features become more apparent for footpath users travelling northwards due to reduced proximity and progression to more elevated positions along the right of way.
- 6.5.45 It is a view that contains a number of attractive components, and one that is strongly influenced by its tranquil valley setting. Notwithstanding this, the orientation of the property is such that only the rear sections of Three Nooks Farm and other visual detractors are perceptible in the mid distance outlook. Occupants of the property are consequently considered to be of medium to high sensitivity, whilst recreational footpath users are deemed to be of high sensitivity to change as their principal focus derives from experiencing the qualities and views of the local area.

#### **Predicted Impacts**

- 6.5.46 The principal impacts on local landscape character and visual receptors relate to the following.

- The temporary introduction of activity during construction (e.g. demolition and erection of a new barn, the laying of underground gas connections, introduction of plant and machinery, and vehicle movements) and the effect on the perception of landscape character and visual amenity.
- Difficulties in visually screening construction activity (due to the nature of the topography, existing vegetation surrounding the site, and the relationship of the site to visual receptors).
- The size, scale, and profile of the new barn in comparison to that already in place.
- Materials, surface finishes and colour treatments applied to the new building, externally sited equipment, and the silage clamp.

6.5.47 To counter some of these impacts, the proposed scheme will be finished to a high standard of design using materials sympathetic to the local environment, and will be integrated into the surrounding environment through the implementation of a robust and sustainable landscape planting strategy.

6.5.48 Existing planting and vegetation will be protected during construction in line with details shown on **Figure 11**, and will be implemented prior to the start of works.

#### *Landscape Character Impacts*

##### Construction Phase

6.5.49 The construction of the proposed scheme would involve a range of activities and would give rise to localised changes to landscape character. Collectively, equipment including cranes, plant, machinery, HGVs and construction materials will be present within the site.

6.5.50 Although such activity would form a character influencing feature in the local landscape, any effects would be temporary in nature and would be set against a context of established visual detracting features (e.g. the existing telecommunications mast at Moortop) and regular agricultural activity associated with the wider landscape and its local transport routes.

6.5.51 No existing vegetation will be lost during construction. When considering the existing context, the magnitude of impact during construction will be in the order of **Low to Medium** and adverse by virtue of the focused nature of activity that would arise within the farm, but which will persist for a short duration of time.

##### Year of Opening

6.5.52 Post completion of the construction works, the appearance of the new barn and silage clamp will be in keeping with many existing buildings typical of this upland agricultural landscape, and will retain a strong physical relationship and association with surrounding farm structures. Perception of the external generating equipment will be very limited due to their physical containment behind built form, earth mounding and planting.

6.5.53 Although the gas exhaust vents will marginally top the profile of the barn roof, these will be countered by the overall appearance of the barn as an agricultural shed constructed of materials commonly found throughout the wider landscape.

6.5.54 The positioning of the new barn, silage clamp and external equipment within the curtilage of Three Nooks Farm will not render the proposals as a new, distinctive character forming feature nor impose a perception of 'industry' in the landscape.

- 6.5.55 Given the design of the new barn has been developed to integrate with the local landscape pattern, and will effectively replace an existing visually detracting agricultural building, the overall impact on landscape character will be **Neutral**.

#### *Visual Impacts*

##### Construction Phase

- 6.5.56 As construction commences, there will be a gradual change in the visual environment from the identified receptors as the demolition of existing buildings occurs. Visual impacts will accordingly fluctuate throughout the different construction phases and activities, as progress is made towards the erection of the new barn and silage clamp, and the installation of ancillary external equipment and the underground gas pipeline connection.
- 6.5.57 A combination of intervening built form and vegetation in the wider landscape will visually contain a proportion of the lower level temporary construction works and activity in views. Activities will occur during a period when foliage cover is beginning to establish (April 2013 onwards) which will also assist in reducing visual exposure of the works.
- 6.5.58 Construction works will not appear unfamiliar or uncommon with previous developments in the local landscape, or ongoing farming and land management operations. Given the temporary nature of these operations, the magnitude of impact associated with this phase is assessed as being of between **Low and Medium** from the identified visual receptors.

##### Year of Opening

##### Wellfield Farm / Poolside Farm

- 6.5.59 Post construction, the ground floor outlook from this receptor will not be subject to any readily perceptible change, given that the existing agricultural barn (to be demolished) is not discernable in the view.
- 6.5.60 Despite a gradual fall in the landform towards the site, any changes to the composition of the outlook will generally be confined to the upper floor windows of both properties. In these views, the upper sections and roofline of the new barn will be obliquely visible in the mid-ground.
- 6.5.61 Newly introduced components in the view will be positioned in comparable locations to those existing elements identified for demolition and/or removal; however the roofline and vent stacks will marginally top the original height of the demolished agricultural barn. The unweathered finish of the roof of the new barn will also appear as a perceptible feature when set against a background of agricultural fields, but will only occupy a small percentage of the overall view.
- 6.5.62 Consequently, the magnitude of impact in the year of opening will be, at worst, **Low**.

##### Lask Edge Farm

- 6.5.63 As Three Nooks Farm occupies a reasonable proportion of the outlook from this receptor, views towards the site in the year of opening will be modified to the extent that the new barn (and to a lesser extent the new silage clamp) will appear as discernable new components in the middle distance.

- 6.5.64 The key change will relate to the introduction of a marginally taller apex roof on the new barn, which will be perceptible from ground floor and gable end views at this receptor. The vent stacks will also be apparent, albeit as very small components extending slightly above the roofline.
- 6.5.65 The farmhouse will provide some degree of screening of buildings within the farmyard, effectively blocking lower level sections of the silage clamp entrance and the new barn in the view. Low level coniferous planting around Lask Edge Farm will continue to offer screening benefits to views from ground floor windows.
- 6.5.66 The modifications will not render the farm unit as a new principle point of focus; rather the proposals will replace the visually detracting and dilapidated barn and silage clamp with a more contained, collective and consistent profile of agricultural features constructed of sympathetic materials.
- 6.5.67 Accordingly, the magnitude of impact post construction will be in the order of **Low to Medium**.

#### Catt Hayes Farm / Horton 21 PRoW

- 6.5.68 The modified outlook from Catt Hayes Farm will comprise the eastern flank of the new barn and apex roofline as a discernable, but relatively small, feature in the view against the skyline.
- 6.5.69 The view will also be altered to the extent that the framework, concrete panels and entrance to the new silage clamp will be visible immediately adjacent to the barn, albeit at a much lower height and partially screened by boundary vegetation in the foreground and mid-ground.
- 6.5.70 The finish of the new barn and apex roofline will be seen as a slight improvement over the current situation. Potential exists for the outlook to include the vertical vent stacks protruding slightly above the new roofline, particularly from Horton 21 PRoW in closer proximity to the site.
- 6.5.71 Existing adjacent barns and structures will continue to provide visual screening of much of the farmyard, including the southern and western elevations of the new barn. Consequently, the balance of components within the view will not be changed to an extent that the new proposals become a key feature in the outlook.
- 6.5.72 Given the composition of the view and the minor changes predicted, the magnitude of impact post construction is considered to be **Low** from Catt Hayes Farm. From southern sections of Horton 21 PRoW, the increased perception of the site afforded to recreational users through a combination of reduced vegetation screening and closer proximity will render a greater impact magnitude in the order of **Medium**.

#### **Landscape Mitigation**

- 6.5.73 The proposed planting strategy is depicted on **Figure 14**, with indicative cross sections presented in **Figure 12**. The strategy has been developed to:
- Accord with objectives detailed in SCC's study into landscape change, specifically to assist the restoration of a landcover structure within the Gritstone Uplands landscape character type and to screen the visual consequences of development.
  - Ensure integration of the proposed scheme into the receiving landscape pattern.

- Maintain the open aspect and general character of the existing local landscape through targeted planting of broadleaved trees and hedgerow species.
- Provide a degree of softening, screening and containment for visual receptors in proximity to the proposed scheme.
- Enhance the local landscape structure and compensate for the loss of established landscape features.

6.5.74 Given the nature and short duration of the proposed construction operations, it is not considered appropriate to implement any temporary landscape mitigation strategies such as the formation of soil mounds for visual screening.

6.5.75 Minor earthworks will be undertaken on the northern side of the new silage clamp and externally sited generating equipment. This will comprise excavated soil from elsewhere on the farm, and will be profiled to achieve a maximum height of approximately 308m AOD.

6.5.76 The mounding will provide some 3 – 4 m additional height over existing ground levels, which will be planted with an appropriate mix of tree and shrub species that in time will form an effective visual screen of the proposed barn and silage clamp in views from the north-west and Horton 21 PRow. The type of planting proposed will also integrate with established linear planning along the western edge of the farmyard.

6.5.77 Planting proposals will be undertaken in the first available planting season following construction of the proposals. All planting materials, operations, supply and handling would be in accordance with British Standards and good horticultural practice.

6.5.78 A post and wire stock fence will be installed to provide separation for users of Horton 21 PRow from the silage clamp walls.

### **Landscape and Visual Effects**

#### *Landscape Character*

6.5.79 By Year 15 planting will have achieved its intended height and function. In addition, materials used in the construction of the proposals will have weathered over time to achieve more subdued tones.

6.5.80 Whilst this will assist the visual screening and integration of many elements of the proposed scheme into the local landscape pattern, it will not render a readily perceptible change to the composition and key characteristics of the local landscape.

6.5.81 Accordingly, the significance of effect on landscape character will be **Neutral** at Year 15.

#### *Visual Amenity*

6.5.82 Over time, the hard and soft landscaping proposals implemented as part of the proposed scheme will become established. The following effects on landscape character and visual amenity are predicted at Year 15.

#### Wellfield Farm / Poolside Farm

6.5.83 The establishment of planting on top of earthworks mounding to the rear of the new barn and silage clamp will have a marked effect on reducing the visibility of these structures from upper floor windows of these properties, such that their profiles will be effectively screened from view.



6.5.84 The significance of effect at Year 15 will accordingly be **Neutral**.

Lask Edge Farm

6.5.85 The relationship of planting proposals to the angle of view from this receptor will not provide any direct visual screening of the new structures; rather they will contribute to softening the profile of the new barn roofline and its appearance against the agricultural backdrop.

6.5.86 This will result in an effect of **Neutral to Slight Adverse** significance by Year 15.

Catt Hayes Farm / Horton 21 PRoW

6.5.87 Post establishment, the upper sections of planting around the rear of the new silage clamp will be partially visible. This will have a visual effect not dissimilar to that described for Lask Edge Farm, but will provide increased softening of the new barn roofline against the skyline.

6.5.88 The effect at Year 15 will accordingly be of **Neutral** significance from both Catt Hayes Farm and Horton 21 PRoW.

## **6.6 Ecological Impacts**

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### **Background**

6.6.1 Scoping concluded a need to give detailed consideration to potential impacts on ecological interests. The following section accordingly describes the findings of an ecological assessment, the purpose of which has been to identify and evaluate the potential effects on ecology and nature conservation interests resulting from construction and operation of the proposed scheme at the site.

### **Scope of the Assessment**

6.6.2 Experienced ecologists within RSK Environment Ltd discussed and agreed a scope for the assessment with the county ecologist between October 2011 and February 2012. Discussions were informed by the preparation of a land ownership plan and definition of an appropriate ecological study area around the site.

6.6.3 It was agreed that the assessment:

- Could be undertaken in February 2012, and did not need to cover potential routes associated with the underground electrical cable connection (as this is a matter for the local DNO to consider separately).
- Could be appropriately constrained to all farmland within the curtilage of Three Nooks Farm, east of Top Road / Lask Edge Road.
- Would comprise a Phase 1 Habitat Survey and protected species walkover, the latter to specifically include an assessment of the suitability of the existing agricultural barn (Animal Note 1, **Figure 21**) to support bats and barn owl, and any evidence of badger and early breeding birds at the site.

### Assessment Methodology and Criteria

- 6.6.4 The assessment has been based on the proposed scheme, as described in **Section 5** of this Statement and depicted within the enclosed project plans, descriptions, elevations and cross-sections. It has been informed by a combination of desk based and site based appraisal techniques, and professional judgement.
- 6.6.5 The assessment commenced with a background data search to acquire information and records pertaining to statutory and non-statutory designated sites, and protected and notable species, within 2 km of the site.
- 6.6.6 Data sources comprised: Staffordshire Ecological Record; Multi-Agency Geographic Information for the Countryside (MAGIC); the National Biodiversity Network (NBN); and surveys and assessments undertaken as part of consented planning applications SM.10/06/161 M and SM.11/18/161 M.
- 6.6.7 The desk-based review of available data concluded that potential exists at the site to encounter: Bats; Barn Owls; Breeding Birds; Great Crested Newt; Badger; and Common Reptiles. Two experienced ecologists accordingly undertook a Phase 1 Habitat Survey on 21<sup>st</sup> February 2012 to record and assess existing habitats, and to identify signs of/potential for protected species presence.

#### *Phase 1 Habitat Survey*

- 6.6.8 The Phase 1 Habitat Survey followed best practice methodologies and guidance<sup>6</sup>. This involved the mapping of habitats using standard colour codes, with target notes (see **Appendix 4**) being made where appropriate to record and describe habitats and features of ecological interest.
- 6.6.9 A habitat assessment for protected species (below) was undertaken in conjunction with the Phase 1 survey; this involved identification of recognisable areas (e.g. habitat, land parcels or locations) considered suitable for protected species, with any obvious signs and incidental sightings noted if found. Habitats were also assessed for their general suitability for UKBAP and LBAP vertebrate species such as Brown Hare (*Lepus europaeus*), Hedgehog (*Erinaceus europaeus*), Common Toad (*Bufo bufo*) and certain species of birds.
- **Breeding Birds:** Habitat that might be used by nesting birds was identified; this was searched for evidence of bird nests.
  - **Great Crested Newt:** Aquatic and terrestrial habitat on the site and in the immediate vicinity (up to 500m) was considered for suitability to support Great Crested Newt (*Triturus cristatus*), together with the habitat-connectivity of between the site and suitable habitat areas outside the site boundary.
  - **Badger:** A detailed survey was carried out of the site and all suitable areas within 30m of the site boundary for signs of Badger (*Meles meles*) activity including setts, foraging signs, paths (runs) and latrines. A wider area capturing all land within the farm curtilage was also surveyed to identify areas that might be used by Badgers for sett building or foraging.

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<sup>6</sup> Handbook for Phase 1 Habitat Survey: A technique for environmental audit' (JNCC, 2003)

- **Reptiles:** The site was assessed for its suitability for each of the four common reptile species: Common Lizards (*Zootoca vivipara*), Slow-worms (*Anguis fragilis*), Grass Snakes (*Natrix natrix*), and Adders (*Vipera berus*). Particular attention given to features providing: suitable basking areas (e.g. south-facing slopes); hibernation sites (e.g. banks, walls, piles of rotting vegetation); and opportunities for foraging (rough grassland and scrub).
- **Bats:** Habitats were assessed for their suitability for foraging and commuting bats. Areas of particular interest vary between species; accordingly sheltered areas and habitats with good numbers of insects (e.g. woodland, scrub, hedges, watercourses, ponds, lakes and species-rich or rough grassland) were surveyed.

#### *Bat Survey*

- 6.6.10 The Bat Conservation Trust (BCT) provides guidance and a methodology for undertaking initial building inspections and roost site surveys in Bat Surveys: Good Practice Guidelines (2007).
- 6.6.11 Bats are crevice-dwelling mammals and therefore it is often difficult to thoroughly inspect buildings for bats and evidence of bats without a destructive search, which is not generally practical or acceptable. Experienced ecologists undertook bat surveys of the existing agricultural barn in accordance with these guidelines, and assessed its bat roost potential according to several factors: surrounding habitat (whether there are potential flight-lines and suitable bat foraging habitat nearby); building construction detail; and building condition (i.e. internal conditions, potential bat-access points and potential roosting locations).
- 6.6.12 A description of the existing barn was recorded on survey sheets, with digital photographs taken as a visual record. Criteria used in the assessment are as follows.
- **Negligible Potential:** Buildings with no features suitable for supporting roosting bats. Well maintained buildings or built structures that provide few opportunities for bat access/roosting (i.e. with no cracks or crevices). Building composed of prefabricated steel and sheet materials. No internal loft space. High level of regular disturbance; high interior light levels and subject to large temperature fluctuations. Buildings may be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
  - **Low Potential:** Buildings with limited features to support roosting bats - shallow crevices (e.g. where mortar is missing between brickwork). Buildings may have large open locations subject to large temperature fluctuations. Buildings may be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
  - **Moderate Potential:** Buildings with some features suitable for roosting bats – building usually of brick or stone construction with a small number of features suitable for roosting bats – loose roof or ridge tiles, gaps in brickwork, gaps under fascia boards, and/or sealed internal loft space. No evidence of bats found.
  - **High Potential:** Buildings with a large number of suitable roosting features or extensive areas with potential for roosting bats. Sheltered locations with a stable temperature regime and suitable access points. Roost features can include: weatherboarding and/or hanging tiles with gaps/large (>20cm) roof timbers with mortise joints, cracks, holes; poorly maintained fabric providing ready access into roofs, walls, but at the same time not being draughty and cool; large and complicated roof void with unobstructed flying spaces. No evidence of bats found.

- **Confirmed Roost:** Bats or evidence of bats recorded within the building during the initial inspection surveys or during dusk/dawn surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

6.6.13 The existing agricultural barn was inspected externally and internally for bats, with the following features investigated (where present): roof slopes and the ridge; wall, window and door surfaces; window and door frames; wall bases; wall ledges and wall tops; roof voids; roof beams; cracks, crevices and sheltered voids including joints; floors and on tops of stored items; and external features such as soffits, barge boards and lead flashing.

6.6.14 Evidence searched for included: droppings; urine stains; staining from fur-oils; scratch marks; wear marks; feeding remains; dead bats; odour; squeaking and chattering; and the absence of cobwebs across the opening of gaps or crevices.

#### *Barn Owl*

6.6.15 All sections of the existing agricultural barn were searched for evidence such as pellets, nests, droppings and feathers to assess its suitability to support Barn Owls.

### **Baseline Environment**

#### *Existing Records*

6.6.16 A review of existing data confirms there are recent records for *Meles meles* (Badger), *Pipistrellus pipistrellus* (Common Pipistrelle), *Pipistrellus pygmaeus* (Soprano Pipistrelle), *Plecotus auritus* (Brown long-eared Bat), *Myotis mystacinus* (Whiskered Bat), *Myotis mystacinus/brandtii* (Whiskered/Brandt's Bat), *Myotis daubentonii* (Daubenton's Bat) and *Nyctalus noctula* (Noctule) in the area.

6.6.17 There are no existing records of protected animals at the site; however a lack of records within an area does not prove absence.

#### *Habitat Types*

6.6.18 The Phase 1 Habitat Survey confirmed the following habitat types as present at the site; these have been mapped and are presented on **Figure 21**.

#### Hedgerow, Scrub and Woodland

6.6.19 Species-poor hedgerows typically form the boundaries between fields at the site. In most cases these are dominated by *Crataegus monogyna* (Hawthorn) and *Ilex aquifolium* (Holly) with a field-layer of rough grassland and semi-ruderal species such as *Arctium minus* (Lesser Burdock), *Dactylis glomerata* (Cock's-foot), *Digitalis purpurea* (Foxglove), *Festuca rubra* (Red Fescue), *Rubus fruticosus* agg. (Bramble), *Rumex obtusifolius* (Broad-leaved Dock) and *Urtica dioica* (Common Nettle). The hedgerows are generally gappy and cut to approximately 2m. Some larger tree species, including *Ilex aquifolium* (Holly), *Malus sylvestris* (Crab Apple), *Quercus robur* (Pedunculate Oak) and *Salix sp* (Willow) between 10m and 15m high are present within the hedgerows and in places, field boundaries are formed by scattered individual trees rather than a continuous hedgerow.

- 6.6.20 Towards the south-eastern corner of the site, there is an area of woodland dominated by *Betula pendula* (Silver Birch), *Fraxinus excelsior* (Ash), *Ilex aquifolium* (Holly) and *Quercus robur* (Pedunculate Oak). This covers both a proportion of the improved pasture farmland to the west and a steep-sided, wooded stream-course. The understorey of the woodland is characterised by both rough grassland within the flatter field margin boundaries and steep banks of the stream-course are vegetated with *Dactylis glomerata* (Cock's-foot), *Pteridium aquilinum* (Bracken) and *Rubus fruticosus* agg. (Bramble). At the base of the steep, wooded banks there is a fast-flowing stream.
- 6.6.21 Towards its western end, the woodland develops into scattered scrub, particularly around ditch banks, pond edges and marshy areas. These areas are characterised by *Juncus effusus* (Soft-rush), *Phalaris arundinacea* (Reed Canary-grass), *Rosa canina* (Dog-rose), *Rubus fruticosus* agg. (Bramble), *Ulex europaeus* (Gorse) and *Urtica dioica* (Common Nettle).

#### Ponds, Drains and Watercourses

- 6.6.22 There are three ponds (Target Note 9, 11 and 13) within the survey area.
- 6.6.23 Pond 1 (at Target Note 13) is a large, square pond at the eastern end of the farm which is used to collect agricultural runoff. The pond appears highly eutrophicated with no aquatic vegetation, the base and banks of which are constructed from concrete. The surrounding habitat includes the hardstanding and buildings of the farm to the west, and improved pasture to the north, east and south.
- 6.6.24 Pond 2 (Target Note 11) is a small field pond within improved pasture. The northern edge of the pond is surrounded by scrub and woodland. The pond is generally open with some patches of blanket weed (algae - indicating eutrophication) and an area of *Veronica beccabunga* (Brooklime) at the eastern end. The banks of the pond are dominated by *Juncus effusus* (Soft-rush).
- 6.6.25 Pond 3 (Target Note 9) is a defunct concrete pond that does not hold water. It is now heavily vegetated by *Phalaris arundinacea* (Reed Canary-grass) and *Salix spp* (Willow).
- 6.6.26 There are several drains across the survey area. The improved pasture has a network of shallow field drains that are predominantly fast-flowing with no aquatic vegetation. The majority of the drains appear to flow towards the stream within the woodland at the south-east of the site. A drain in the centre of the site originates from a marshy area within the improved pasture and the overflow from Pond 1.
- 6.6.27 There is a single watercourse on the site flowing through woodland south-east of the site. The stream is generally fast flowing and due to the steep nature of the banks, forms waterfalls and pools. It is shallow and contains no aquatic vegetation with the bed of the stream composed of bare bedrock.

#### Rough Grassland

- 6.6.28 There are rough grassland strips along the hedgerow banks and many of the field boundaries. It is the main habitat adjacent to the existing tracks and hard-standing as well as the ditches and watercourses, being mostly dominated by *Arrhenatherum elatius* (False Oat-grass) and *Dactylis glomerata* (Cock's-foot) with scattered *Galanthus nivalis* (Snowdrop), *Ranunculus repens* (Creeping Buttercup) and *Rumex acetosa* (Common Sorrel). Most of the rough grassland appears to have been mown in the past to achieve a shorter sward.

#### Marshy Grassland

- 6.6.29 In some areas of improved grassland, particularly around lower lying areas of fields and ponds, the grassland becomes wetter and dominated by species such as *Juncus effusus* (Soft-rush). These areas appear to be heavily poached by cattle.

#### Improved Pasture

- 6.6.30 Farmland across the survey area comprises improved pasture typically dominated by the grass *Lolium perenne* (Perennial Rye-grass) with *Cirsium arvense* (Creeping Thistle), *Cirsium palustre* (Marsh Thistle), *Juncus effusus* (Soft-rush), *Trifolium repens* (White Clover) and *Ranunculus repens* (Creeping Buttercup).

#### Amenity Grassland

- 6.6.31 There is amenity grassland (lawn) in the garden of the farmhouse. It is characterised by a dominance of *Festuca rubra* (Red Fescue) and/or horticultural cultivars of fine-leaved species such as *Agrostis spp* (Bent grasses). Herbs in the sward typically include *Bellis perennis* (Daisy), *Trifolium repens* (White Clover) and *Taraxacum agg.* (Dandelion).

#### Hard-standing

- 6.6.32 There are areas of hard-standing primarily around the existing farm buildings. This includes both tarmac and gravel roads and tracks.

#### Protected Species Walkover

- 6.6.33 The following was recorded during the habitat suitability survey.

#### Bats

- 6.6.34 The habitats on site and adjacent to the site provide relatively good foraging habitat for bats, especially the hedgerows, lines of trees and rough grassland.
- 6.6.35 Mature trees suitable for foraging and commuting bats are located at the south-east of the site within a small wooded depression; it is also possible that these trees support roosting bats. As there will be no disturbance to this area as part of the works, more detailed surveys are not considered necessary.

#### Breeding Birds

- 6.6.36 Areas of scrub, hedgerow, rough grassland and trees within the site and in the wider area provide habitat suitable for breeding birds.

#### Great Crested Newts

- 6.6.37 The background data search returned no records of Great Crested Newt in the local area.
- 6.6.38 There is a small pond located adjacent to an area of woodland approximately 150m south of the site (Animal Note 2, **Figure 21**). The pond is approximately 50m<sup>2</sup> with good water quality and a limited amount of submerged and marginal vegetation. The habitat surrounding the pond comprises mature scrub and grazed pasture. This pond will not be directly affected by the proposals, and is separated from the site by a fast-flowing stream.

6.6.39 There is a large settling pond located adjacent to the farm buildings (Animal Note 3, **Figure 21**). This artificial pond contains agricultural run-off (slurry), and as a result is severely eutrophic with no aquatic vegetation and very poor water quality.

6.6.40 Since Great Crested Newts are known to use terrestrial habitat up to 500m away from breeding ponds, the wider landscape has been taken into consideration. The majority of the site is dominated by semi-improved grazed grassland and due to the absence of refuges has low suitability for Great Crested Newts. The field margins, hedgerows, areas of scrub and woodland patches, are suitable for dispersal, commuting and foraging activities and hibernation.

#### Badgers

6.6.41 In general, the habitat present is good foraging habitat for Badgers, including hedgerows and grazing pasture, and is suitable for Badger sett building.

6.6.42 No evidence of Badger was recorded within 30m of the proposed scheme; therefore the survey is considered sufficient to demonstrate that the species is absent from the site.

#### Common Reptiles

6.6.43 The semi-improved grassland where the development is located has limited suitability for reptiles. However, the rough, unmanaged grassland at the field margins is suitable for foraging and basking reptiles, and the hedge-bases are suitable refuges, including for hibernation.

#### Other Protected or Notable Species

6.6.44 During the survey a European Brown Hare (*Lepus europaeus*) was seen in the field adjacent to the wooded stream (Animal Note 4, **Figure 21**). This species is listed on the UK BAP priority species list.

6.6.45 No suitable habitats exist within the site for any other protected or BAP species.

#### Bat Survey

6.6.46 Building descriptions, potential bat entrance points, potential bat roosting places and a category of bat roosting potential are detailed in **Appendix 5**.

6.6.47 There was no evidence of roosting bats in the existing agricultural barn, and it is considered unsuitable for roosting bats. Due the following factors, the structure can effectively be ruled-out for roosting bats.

- A lack of crevices and cavities.
- Its construction is of plastic and metal, resulting in large temperature fluctuations through the day and night and thereby reducing suitability as a bat roost.
- No roof voids and metal joists in the internal space.
- Some aspects of the building have no walls, so there is no protection from the external elements.

- 6.6.48 A single bat dropping was recorded within the building, adjacent to the open-sided southern aspect. No other droppings or feeding remains, which would indicate a feeding perch or night roost, were recorded. There were also no suitable roosting features within the section of the building that the dropping was found; the dropping is likely to be from a bat entering the building at the open southern aspect and foraging, which does not indicate the presence of a roost.

#### *Barn Owls*

- 6.6.49 The barn has high levels of disturbance from livestock, machinery and farm operations, and the internal construction of the building provides limited nesting opportunities for Barn Owls.
- 6.6.50 No evidence of Barn Owl was recorded within the building during the survey; therefore this species is not considered further in the assessment.

#### *Breeding Birds*

- 6.6.51 Due to the timing of surveys undertaken in February 2012, it could not be conclusively established whether birds nest at the site. Accordingly, further breeding bird surveys were undertaken in March 2012 and June 2012.
- 6.6.52 These surveys concluded that, in general, existing field boundary hedgerows are sparse and gappy. Many of the single trees adjacent to the existing farm driveway are small and not considered suitable for nesting birds.
- 6.6.53 Four nests were recorded on site during the March 2012 survey. These were located in boundary hedgerows and appeared inactive, concluding that they were likely to be remnants from last season's breeding activity.
- 6.6.54 The June 2012 follow-up survey confirmed the four nests remained in place, and that none were in use. Although no new nests were identified, the follow-up survey did record three fledglings and one adult Chaffinch within a hedgerow on the southern boundary of the field within which the wellhead will be installed (as part of consented works under SM.11/18/161 M.)
- 6.6.55 No signs of ground nesting birds were recorded in the survey, and no ground nesting birds were observed on site.

### **Predicted Impacts**

#### *Botanical*

##### Hedgerow, Scrub and Woodland

- 6.6.56 Woodland and hedgerows are recognised as nationally important habitats under the UK Biodiversity Action Plan (UKBAP), which lists *Lowland Mixed Deciduous Woodland* and *Hedgerows* as 'Priority Habitats' for conservation and enhancement.
- 6.6.57 All woodland and hedgerow habitats should be accorded at least local importance (possibly higher importance for the better examples). The woodland and hedgerows within the survey area are generally species-poor, and further botanical surveys are not considered necessary.



#### Ponds, Ditches and Watercourses

- 6.6.58 Standing Open Water (including ponds) is listed on the UKBAP as a priority habitat. The ponds on site are unlikely to be directly affected by the proposed scheme, and therefore do not require further botanical survey.
- 6.6.59 Rivers and streams are listed on the UKBAP as a priority habitat, and the better examples have ecological importance. Ditches and drains are also important habitats for many species, particularly as connecting habitats. As construction of the proposed scheme will not affect existing ditches and watercourses, no further botanical surveys are necessary for these habitats.

#### Rough Grassland

- 6.6.60 No species-rich grassland was recorded. The grasslands along the ditch banks, hedgerow banks and adjacent to access tracks is species-poor and of a type that is common and ubiquitous throughout the UK. No further botanical surveys are required.

#### Marshy Grassland

- 6.6.61 The marshy grassland overlying improved pasture is species-poor rush-pasture. The area presents important commuting habitat for amphibian species; however as these areas will be unaffected by the proposed scheme, no further botanical surveys are required.

#### Improved Pasture

- 6.6.62 Agriculturally improved grasslands are common and ubiquitous throughout the UK. These habitats are species-poor and easily re-creatable and so can be considered to have only negligible ecological value. No further botanical survey work is needed in these areas.

#### Amenity Grassland

- 6.6.63 Amenity grasslands are common and ubiquitous throughout the UK. These habitats are easily species-poor and re-creatable and so can be considered to have negligible ecological value. No further botanical survey work is needed in these areas.

#### *Protected Species*

##### Badgers

- 6.6.64 No evidence of Badger was recorded; therefore no licences or mitigation will be required.
- 6.6.65 Notwithstanding the assessment conclusions, Badgers are acknowledged to be a highly mobile species. Should implementation of the proposed scheme not commence within 6 months of these surveys, the surveyed area will be inspected again by the applicant prior to any site works to ensure that the situation has not changed.

##### Great Crested Newt

- 6.6.66 The site comprises habitats around its perimeter that are suitable to support foraging and hibernating Great Crested Newts. The small pond located approximately 150m south of the construction site may support breeding newts.
- 6.6.67 No records of Great Crested Newts were returned in the background data search, and this pond is separated from the site by a fast-flowing stream (which newts are unlikely to cross); therefore no further surveys will be necessary.

6.6.68 Construction of the underground pipeline will primarily be undertaken in open, grazed pasture. The new barn will be positioned on a comparable footprint to the existing barn to be demolished. Both areas are considered unsuitable for Great Crested Newts.

6.6.69 Should any works be undertaken within habitat suitable for Great Crested Newts such as rough grassland or scrub, precautions will be taken to minimise the risk of affecting this legally protected species during the course of the works.

#### Common Reptiles

6.6.70 No records of common reptiles were returned in the background data search.

6.6.71 For reasons cited in Great Crested Newts (above), the proposed scheme is unlikely to involve disturbance to habitat suitable for reptiles, including potential hibernation sites.

#### Breeding Birds

6.6.72 The assessment did not record any evidence of breeding birds at the site.

6.6.73 Should there be a requirement to remove any existing vegetation that might be used by nesting birds, this will be undertaken outside the bird nesting season (March to August) to ensure compliance with legislation protecting nesting birds.

6.6.74 As the programme for the proposed works conflicts with the bird nesting season, vegetation will be checked for nests immediately prior to works commencing at the site. The survey findings will be shared with SCC's county ecologist to agree any requirements for mitigation (e.g. retention of nests until the young have fledged).

6.6.75 Subject to adherence to the above measures, there will be no impacts on breeding birds.

#### Brown Hare

6.6.76 Evidence of European hare has been identified at the site. This species has limited protection through the Ground Game Act (1880), and is a UK Biodiversity Action Plan Priority species.

6.6.77 There is a legal requirement not to cause any wild animal unnecessary suffering under the Wildlife and Countryside Act amended (1981); therefore, prior to the commencement of construction works an ecologist will be consulted to ensure that no animals become injured, harmed or trapped by the works.

#### Bats

6.6.78 No evidence of roosting bats was found, and the existing agricultural barn provides limited roosting opportunities for bats.

6.6.79 The southern aspect of the structure has overlapping metal sheets with gaps between; however the construction of the building and the materials are likely to generate large temperature fluctuations resulting in less than suitable conditions for roosting bats.

6.6.80 Taking into consideration the low suitability of this potential roosting habitat, and avoidance measures (mitigation) set out below, it is deemed unlikely that bats use any part of the building for roosting. No further surveys are considered necessary given the very limited potential to impact on this species.

**Mitigation**

- 6.6.81 Vegetation along the boundaries of the site is considered suitable for foraging and commuting bats. Provision has been made in the design of the proposed scheme to retain this vegetation to ensure that potential commuting routes are not severed.
- 6.6.82 Reasonable avoidance measures will be taken when demolishing the existing agricultural barn to avoid harm to bats. Precautionary measures will be applied should demolition of the structure need to be undertaken during the bat active season. The potential roosting feature identified on the southern aspects of the structure (see **Appendix 5**) will be taken apart using hand-tools only, and under the supervision of a Licensed Bat Ecologist.
- 6.6.83 In the unlikely event that bat roosts are found during demolition, works will cease immediately and a European Protected Species licence will be sought from Natural England to allow work to continue. Such licences permit activities to be undertaken that may otherwise result in an offence (e.g. destruction of roost sites), and require appropriate mitigation to be agreed and implemented.

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## 7 PLANNING POLICY

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### 7.1 Background

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- 7.1.1 The plan-led approach to development planning requires proposals to accord with adopted development plans, unless material considerations determine otherwise.
- 7.1.2 The following documents provide the statutory framework for guiding development proposals in Staffordshire, and form the primary basis for consideration of planning applications for development of the type proposed at the national, regional and local level.
- National Policy Statements (NPSs).
  - The National Planning Policy Framework (NPPF) and associated technical guidance.
  - West Midlands Regional Strategy (RSS) (2008).
  - The Staffordshire and Stoke-on-Trent Structure Plan 1996 – 2011 (adopted March 2001).
  - The Staffordshire and Stoke-on-Trent Minerals Local Plan 1994 – 2006 (adopted December 1999).
  - The Staffordshire Moorlands Local Plan (adopted September 1998).
- 7.1.3 A number of guidance documents and other legislation (in the form of Government White Papers, Acts, Parliamentary Decisions etc) can also form material considerations in the planning process.
- 7.1.4 A review has been undertaken of the relationship between the proposed scheme and the above documents to assess conformity (or otherwise) with policy objectives.
- 7.1.5 The principle of accommodating the type of development proposed within the county of Staffordshire has already been established in planning terms following the development of a number of similar sites where underground methane is extracted and used to generate electricity.

### 7.2 Policy Context

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- 7.2.1 A wide range of policies exist at the national, regional and local level which seek to control development within the framework and aims of sustainable development. The following summarises the principal development and minerals planning policies considered relevant to the proposed scheme<sup>7</sup>.
- 7.2.2 Current forecasts indicate that conventional offshore gas (and oil) supplies will decline significantly over the coming years, with a consequential increase in the demand for imports to fulfil the nation's energy needs.

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<sup>7</sup> Policies considered in this application are correct at the time of review and appraisal (June 2012).

- 7.2.3 There is a clear need in the UK to reduce our dependency on energy imports and maximise our domestic energy supplies, as outlined in the Department of Energy and Climate Change Annual Energy Statement July 2010. *'The UK's own indigenous supplies of oil and gas remain important... we must maximise economic production while applying effective environmental and safety regulations.'*
- 7.2.4 Action 11 of the statement notes *'In the forthcoming Energy Security and Green Economy Bill, we will seek to ensure that access to UK oil and gas infrastructure is available to all companies. This will help the exploitation of smaller and more difficult oil and gas fields, allowing us to make the most of our natural resources.'*
- 7.2.5 The sustainable use of minerals is emphasised in the 2012 NPPF, in which it states *'Minerals are essential to support sustainable economic growth and our quality of life...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.'*
- 7.2.6 The NPPF also states that *'planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions...and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social and environmental dimensions of sustainable development'*. The NPPF goes on to state that *'When determining planning applications, local planning authorities should...recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions'*.
- 7.2.7 The National Policy Statement (NPS) sets out national policy for energy infrastructure. This comprises an overarching NPS (EN-1) and five technology specific NPSs for the energy sector. NPS EN-1 states that *'energy is vital to economic prosperity and social well-being and so it is important to ensure that the UK has secure and affordable energy. Producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of infrastructure, both large and small scale'*.
- 7.2.8 The applicant contends that the gas production aspect of the proposed scheme – through the use of clean technology – fully accords with the principles set out in current national policy, specifically in relation to central government's position on the benefits of exploiting untapped energy resources through land-based exploration, appraisal, development and extraction of gas. The proposals will also assist in ensuring security of future energy supplies.
- 7.2.9 A well established tenet of planning policy is that inappropriate development within the Green Belt will not be permitted, except in very special circumstances. The NPPF states that *'mineral extraction need not be considered inappropriate within the Green Belt, provided it preserves the openness of the Green Belt and does not conflict with the purpose of including land in the Green Belt'*.
- 7.2.10 The proposed scheme has been designed to achieve high environmental standards, with due regard given to policies which seek to ensure good design in new developments. Accordingly, and in light of the national position set out in the NPPF, the applicant considers the form and nature of the proposed scheme does not conflict with Green Belt objectives and will not affect the preservation of its openness at the site.
- 7.2.11 In relation to minerals policy, environmental measures incorporated into the design will assist in achieving compliance with national and regional minerals policy (as set out in the NPPF and RSS Policy M4). Although no specific reference is made to gas extraction in local minerals policy, the applicant contends that such measures will assist compliance with Policy 12 of the Minerals Local Plan by reducing potential adverse impacts on sensitive receptors.

- 7.2.12 A number of local planning policies are in place that seek to: protect environmental resources and interests (e.g. ecological habitats and landscape features); enhance the local environment through good design; and control development related effects (e.g. noise, traffic and visual impact).
- 7.2.13 As set out in this Planning Statement, the applicant has responded to these policies by subjecting the proposed scheme to: consultation with statutory agencies; detailed review to identify overall compliance with local policy; and appraisal and assessment determine its potential effects on the receiving environment.
- 7.2.14 In relation to local policy, the applicant considers that the proposals:
- Will not adversely affect the qualities, character or appearance of the Special Landscape Area designation covering the site (in terms of visual impact, traffic and noise).
  - Will not impinge on any areas of ecological value or result in the loss of any significant vegetation that contributes to the perception (and protection) of landscape character.
  - Will result in limited visual impacts for a small number of residential properties with a clear visual relationship to the site, which will reduce over time as planting measures establish and building exteriors weather into more recessive, muted tones.
  - Incorporate appropriate measures to ensure protection from environmental pollution, and to avoid / minimise disruption during construction works. This will be achieved through a combination of measures such as: improving and controlling drainage; use of mounding and landscaping to provide a degree of visual containment and improve environmental integration; use of local building materials in keeping with the local vernacular; careful site layout (i.e. developing on areas which already accommodate built form of a similar size and scale to that proposed); and implementing a comprehensive site restoration and aftercare strategy post completion of the works.
  - Will not result in an unacceptable increase in traffic (or traffic related safety), as construction vehicles will be restricted to an appropriate highways route. This will ensure conformity with policy regarding developments not resulting in demonstrable harm to the traffic network.
- 7.2.15 The proposed soft landscaping strategy and use of construction materials sympathetic to the receiving rural environment will positively contribute to the objectives of local landscape policy (specifically Structure Plan Policy NC2 and Minerals Local Plan Policy 21). Furthermore, such measures accord with broader NPPF objectives that seek to provide net gains in biodiversity, where possible.

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## 8 SUMMARY

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### 8.1 Conclusions

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- 8.1.1 The applicant and its parent company, Alkane Energy plc, are experts in the field of commercial methane extraction and electricity generation, and currently run a number of such operations across the UK.
- 8.1.2 The proposed works forming the basis of this planning application comprise the second phase of a development that seeks to harness, extract and convert underground gas to electricity at the farm through the installation of generating plant and equipment.
- 8.1.3 Planning consent to implement the first phase of works – comprising the repair of two existing boreholes and appraisal of the underground gas reserve – was granted in February 2012 and is currently being implemented by the applicant.
- 8.1.4 This planning application falls to SCC to determine as the Minerals Planning Authority. Detailed consideration has been given to the potential for the proposals to generate adverse impacts on the local environment, the outcomes of which have been presented in this Planning Statement.
- 8.1.5 An appraisal has been undertaken to determine the relationship between the overarching policy framework concerning developments of the type proposed, and the national position currently adopted by Central Government which seeks to ensure security of supply through the exploitation of indigenous energy supplies.
- 8.1.6 The applicant contends that progression of the proposed scheme at Three Nooks Farm presents a number of key benefits, specifically:
- The scheme will make an important contribution to meeting future energy demands and targets, and in ensuring diversity in energy supply, over a 20 year period.
  - The generation of electricity on the scale proposed is considered more efficient than that associated with large scale coal fired power stations.
  - The development site is located in a rural area with few residential dwellings in the immediate vicinity.
  - The majority of project components will be contained within buildings designed to be sympathetic to - and in keeping with - the local landscape, which will give rise to limited impacts on the receiving local environment.
- 8.1.7 The applicant has developed a comprehensive site restoration and landscaping strategy for implementation post completion of the works, which will enhance local landscape character and make a positive contribution to local policy objectives.
- 8.1.8 The applicant accordingly considers there to be no planning, environmental or other material considerations indicating that Staffordshire County Council cannot grant planning consent for the proposed scheme at this location.

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## **SUPPORTING FIGURES**

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## **APPENDIX 1 – SCC CONSULTATION RESPONSES**

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## **APPENDIX 2 – WIDER CONSULTATION RESPONSES**

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## APPENDIX 3 – OUTLINE SITE WASTE MANAGEMENT PLAN

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**Date:** [insert date of SWMP]

**Revision:** [insert Revision No.]

**Author(s):** [insert name] of Seven Star Natural Gas Limited.

### Background to the SWMP

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Under the Site Waste Management Plan Regulations 2008, it is a legal requirement to prepare a Site Waste Management Plan (SWMP) for construction projects in England with a value of over £300k.

The purpose of a SWMP is to set out how building materials, and resulting waste, are to be managed as part of the proposed works. This plan outlines the procedures that have been put into place and demonstrate how they benefit the environment, how the effects of waste will be measured, and how these procedures and practices are sustainable.

The SWMP is required prior to the start of any site works, and accordingly records decisions made in order to minimise the quantity of waste produced on site. It is a live document that is updated throughout the duration of the proposed works.

### Background to the Client and the Proposed Works

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The proposed works are to: extract underground gas for power generation on land at Three Nooks Farm, Horton, Leek

The client for the proposed works is: Seven Star Natural Gas Limited, Edwinstowe House, High Street, Edwinstowe, Nottinghamshire, NG21 9PR.

The estimated value of the proposed works is £[insert value].

The client is committed to implementing this SWMP and all related environmental controls as part of the proposed works, so that all site works are implemented in an effective, accurate and economical manner.

### Roles and Responsibilities

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The Principal Contractor responsible for undertaking the proposed works is: [insert name and address].

The Principal Contractor's appointed project site co-ordinator is the nominated SWMP Coordinator for the proposed works.

The appointed site co-ordinator is responsible for ensuring the instruction of workers and implementation and overseeing of this SWMP. They are also responsible for monitoring effectiveness and accuracy during routine site visits.

Independent site audits (via site inspection) will be undertaken by: the Client; representatives of RSK Environment Limited - the Client's appointed planning and environmental consultants; and [insert relevant parties].

Copies of any site audits and/or site reports will be forwarded to: [insert relevant parties] for monitoring.

The appointed site co-ordinator shall distribute copies of this SWMP to the aforementioned parties. Notification and distribution will also be undertaken each time the SWMP is revised and updated.

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## **Waste Streams and Minimisation**

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Surplus or waste materials arise from either materials imported to site or from materials generated on site.

Imported materials are those brought to site for use/inclusion in the proposed works (e.g. deliveries). Generated materials are those formed as a consequence of implementing the proposed works (e.g. rubble).

The Client has, from a very early stage of the proposals, investigated ways and methods of minimising waste associated with implementing the proposed works in order to reduce the overall volume of waste to be handled, removed and disposed of.

Specific consideration has been given to: reducing waste; waste segregation; waste disposal; the financial implications of waste disposal; the recording and monitoring of waste; and the education, training and review of site-based contractors.

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## **Waste Management**

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Waste materials fall into three categories for management: re-use; recycle; and landfill.

If surplus materials can be used during the proposed works they are classified as reusable materials. Should materials surplus to requirements need to be removed from site (which can be used in their present form), these will be identified for re-use (e.g. arisings from grubbed up areas of ground).

If surplus material cannot be re-used in its present form but could be used in a different form, then such material will be recycled.

If either of the above cannot be satisfied, then the only remaining option is to dispose of surplus materials to landfill. Landfill will be a last resort as part of the proposed works.

The Principal Contractor will continually review the nature and form of surplus arisings produced, and where possible will set up the site to maximise re-use or recycling where possible.

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## **Waste Segregation**

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A specific area will be laid out and labelled to facilitate the separation of materials for potential recycling, salvage, reuse and return.

Recycling and waste bins will be kept clean and clearly marked in order to avoid contamination of materials. The Waste Awareness Colour Coding Scheme labeling system shall apply.

Skips will be clearly identified so as the workforce are able deposit the correct materials into the correct skip / bin for segregation. All skips will be monitored to ensure that contamination of segregated skips does not occur.

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## **Instruction and Training**

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The appointed site co-ordinator will provide on-site briefings via induction of appropriate separation, handling, recycling, reuse and return methods to be used by all parties and at appropriate stages of the proposed works, where applicable.

Toolbox talks will be regularly undertaken on waste issues. Contractor staff (and any appointed sub-consultants) will be expected to attend to ensure that everyone feels they are included and that their participation is meaningful.

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**Actions**

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The following actions – to be implemented on site as part of the proposed works – have been agreed between Seven Star Natural Gas Limited and the Principal Contractor.

- A dedicated water supply will be installed at the site, in order to minimise the amount of water required to be imported (tankered).
- Materials arising from the grubbing up of hardstanding within the farm and the existing agricultural barn concrete base will be reused elsewhere as on site as fill material to achieve levels.
- Surplus soils arising from the installation of the underground gas pipeline will be reused elsewhere in the farm, either as landscape mounding or as fill material.
- Recyclable waste streams will be dispatched to [insert recipient] for reuse. This recycling depot has been selected to minimise fuel used during transport of waste material from the site.
- Any water that cannot be reused on site due to contamination will be tankered to a licensed treatment plant at: [insert plant name and address], where it will be cleaned for recycling.
- Waste packaging resulting from site deliveries will be stored in separate containers ready for recycling; these will be provided for wood, metal, plastic and paper/cardboard.

These actions will reduce the amount of waste and surplus materials generated on site, which traditionally would be disposed off by landfill.

Both Seven Star Natural Gas Limited and the Principal Contractor are committed to continually identifying waste minimisation techniques; these will be regularly reviewed and if appropriate, incorporated into this SWMP for implementation.

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**SWMP Implementation Checklist**

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Have terms and commercial rates been agreed with all required waste contractors?

For offsite or disposal are all the waste destination details verified?

Has a waste segregation / collection areas been prepared?

Has the waste area been adequately sign posted?

Has the SWMP document control / filing system been set up?

Have all necessary staff and contractors had the SWMP transmitted?

Have all the SWMP training / induction procedures for staff been met?

Have all the SWMP training / induction procedures for contractor/s been met?

Has the SWMP been approved by the Principal Contractor?

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**Declaration**

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**Principal Contractor:** [insert signature]      **Date:** [insert date]

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## APPENDIX 4 – ECOLOGICAL TARGET NOTES

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**Target Note 1:** Species poor hedgerow forming the boundary between adjacent improved pasture fields. Hedgerow is composed primarily of *Crataegus monogyna* (Hawthorn) with scattered *Ilex aquifolium* (Holly). Understorey is dominated by rough grassland and semi-ruderal species such as *Arctium minus* (Lesser Burdock), *Dactylis glomerata* (Cock's-foot), *Digitalis purpurea* (Foxglove), *Rubus fruticosus* agg. (Bramble) and *Urtica dioica* (Common Nettle). The hedgerow is cut to approximately 2m in places with larger *Ilex aquifolium* (Holly) and *Salix* sp (Willow) between 10 and 15m high.

**Target Note 2:** Species poor *Crataegus monogyna* (Hawthorn) hedgerow on a raised bank. A flowing ditch lies at the base of the hedgerow. The understorey is composed of rough grassland and ditch bank species including *Dactylis glomerata* (Cock's-foot), *Digitalis purpurea* (Foxglove), *Festuca rubra* (Red Fescue), *Rubus fruticosus* agg. (Bramble) and *Urtica dioica* (Common Nettle). The hedgerow is more gappy than that at Target Note 1 with the large gaps exposing a post and wire fence.

**Target Note 3:** Hedgerow similar in appearance and composition to *Target Note 2*. There are more substantial gaps present and no ditch at the base. In addition to the cramozi, the hedgerow is comprised of *Ilex aquifolium* (Holly) and *Quercus robur* (Pedunculate Oak) with an understorey of improved grassland and semi-ruderal species including *Dactylis glomerata* (Cock's-foot), *Rumex obtusifolius* (Broad-leaved Dock) and *Urtica dioica* (Common Nettle).

**Target Note 4:** Gappy hedgerow comprising a line of larger trees rather than a true hedgerow. A post and wire fence is present to maintain the field boundary. Species present include *Ilex aquifolium* (Holly), *Malus sylvestris* (Crab Apple) and *Quercus robur* (Pedunculate Oak) between 8 and 12m in height. The understorey is composed entirely of the adjacent improved pasture species.

**Target Note 5:** Flowing ditch similar to that found at the base of the hedgerow at Target Note 2. The ditch is shallow and slow flowing with banks widening to 1m and up to 3m deep in places. The bankside vegetation is dominated by *Chamerion angustifolium* (Rosebay Willowherb), *Hedera helix* (Ivy), *Rubus fruticosus* agg. (Bramble) and *Urtica dioica* (Common Nettle). No aquatic vegetation is present.

**Target Note 6:** area of woodland dominated by *Betula pendula* (Silver Birch), *Fraxinus excelsior* (Ash), *Ilex aquifolium* (Holly) and *Quercus robur* (Pedunculate Oak). This covers both a proportion of the improved pasture farmland to the west and a steep sided clough. The understorey within the woodland is characterised by both improved grassland within the flatter field margins and steep clough banks vegetated with *Dactylis glomerata* (Cock's-foot), *Pteridium aquilinum* (Bracken) and *Rubus fruticosus* agg. (Bramble). At the base of the clough is a fast flowing stream. Towards its western end, the woodland develops into more scattered scrub vegetation; particularly around ditch banks, pond edges and marshy areas. These areas are characterised by *Juncus effusus* (Soft-rush), *Phalaris arundinacea* (Reed Canary-grass), *Rosa canina* (Dog-rose), *Rubus fruticosus* agg. (Bramble), *Ulex europaeus* (Gorse) and *Urtica dioica* (Common Nettle).

**Target Note 7:** Marshy area of improved pasture heavily cattle poached. Wetter areas are dominated by *Juncus effusus* (Soft-rush).

**Target Note 8:** Area of scrub adjacent to woodland and hedgerow and bordering marshy grazing pasture. The area is dominated by *Juncus effusus* (Soft-rush), *Phalaris arundinacea* (Reed Canary-grass), *Rosa canina* (Dog-rose), *Ulex europaeus* (Gorse) and *Urtica dioica* (Common Nettle).

**Target Note 9:** defunct concrete pond which does not hold water. It is now heavily vegetated by *Phalaris arundinacea* (Reed Canary-grass) and *Salix* sp (Willow).

**Target Note 10:** Flowing ditch along a field boundary and adjacent to a hedgerow. The ditch is approximately 1m wide and fast flowing. No aquatic vegetation is present. Further downstream, the ditch becomes a stream, flowing down into the steep sided clough within the woodland at Target Note 6. At this point the stream is fast flowing with waterfalls and pools. Again, there is no aquatic vegetation and the bed of the stream is composed of bare rock. The banks of both the ditch and stream are composed of vegetation in adjacent habitats including rough grassland and the clough understorey vegetation including *Dactylis glomerata* (Cock's-foot), *Pteridium aquilinum* (Bracken) and *Rubus fruticosus* agg. (Bramble).

**Target Note 11:** small field pond within improved pasture. The northern edge of the pond is bounded by an area of scrub and woodland. The pond is generally open with some patches of blanket weed present and an area of *Veronica beccabunga* (Brooklime) at the eastern end. The banks of the pond are characterised by marsh habitat dominated by *Juncus effusus* (Soft-rush).






**Target Note 12:** Rough grassland border alongside an existing access track. Dominated by *Arrhenatherum elatius* (False Oat-grass) and *Dactylis glomerata* (Cock's-foot) with scattered *Galanthus nivalis* (Snowdrop), *Ranunculus repens* (Creeping Buttercup) and *Rumex acetosa* (Common Sorrel). This area appears to have been mown in the past so that it has a short sward.

**Target Note 13:** Large square pond at the eastern end of the farm. This is currently used to collect agricultural run off. The pond appears highly eutrophicated with no aquatic vegetation. The base and banks of the pond are constructed from concrete. The surrounding habitat includes the hardstanding and buildings of the farm to the west and improved pasture to the north, east and south.

**Target Note 14:** Hedgerow composed of *Crataegus monogyna* (Hawthorn) and *Ilex aquifolium* (Holly). The hedgerow is on top of a rough grassland bank dominated by *Dactylis glomerata* (Cock's-foot) with a predominantly dry ditch at the base. The northern end of the ditch contains a small area of open water, approximately 1m wide and 0.1m deep, which appears eutrophicated and is dominated by *Juncus effusus* (Soft-rush).

**Target Note 15:** large silage heap covered over with black plastic. The eastern end is open.

## APPENDIX 5 – BAT SURVEY RESULTS

<p><b>Photo A:</b></p> 	<p><b>Photo B:</b></p> 
<p><b>Description:</b> Eastern (Photo A) and northern (Photo B) aspect have breeze block lower walls with corrugated sheets as upper part of side walls. Roof is slanted and built from corrugated plastic/metal with clear skylights present. Gap where walls meet the roof and gutter have large unsuitable gaps. Narrow crevice present under doorframe where sliding door sits – likely to be subjected to high disturbance levels and unsuitable for bats.</p> <p><b>Bat Roost Potential:</b> None.</p> <p><b>Key Results and Potential Roosting Sites:</b> No evidence of bats found at the time of the survey.</p>	
<p><b>Photo C:</b></p> 	<p><b>Photo D:</b></p> 
<p><b>Description:</b> Southern aspect is only half enclosed with a corrugated metal wall (Photo C). Some small gaps and crevices present where the metal sheets overlap on the wall (Photo D).</p> <p><b>Bat Roost Potential:</b> Low.</p> <p><b>Key Results and Potential Roosting Sites:</b> No evidence of bats found at the time of the survey.</p>	
<p><b>Photo E:</b></p> 	
<p><b>Description:</b> Interior of building (Photo E) has several large access points, as the building currently house cattle and machinery. No roof voids and high light levels inside due to skylights and open sides. Metal joists.</p> <p><b>Bat Roost Potential:</b> None – no roosting features but potential foraging opportunities.</p> <p><b>Key Results and Potential Roosting Sites:</b> Single bat dropping found on surface within the interior.</p>	



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## **APPENDIX 6 – HOUGHTON MAIN DATA**

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## **APPENDIX 7 – PLANT AND EQUIPMENT SPECIFICATION**

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## APPENDIX 8 – NOISE MONITORING RESULTS

Environmental Noise Monitoring Results.									
Instrumentation - Cirrus Type CR:811B (Serial No: C18728FD) Precision Integrating SLM									
Instrumentation Calibration Date - May 2011									
Weather Conditions - Light rain, very slight breeze, temp 14C.									
Monitoring Location: Adjacent to Lask Edge Farmhouse, Leek Lane / Lask Edge Road junction.									
Date	Time	Run Time	Leq	Lmax	Lmin dB	L1 dB	L10 dB	L50 dB	L90 dB
20/06/11	20:22	00:02:21	57.4	84.8	31.7	64.6	56.4	42.3	36.4
20/06/11	20:25	00:05:00	45.4	62.4	29.2	55.6	48.6	38.6	32.8
20/06/11	20:30	00:05:00	37.5	56.9	29.9	44.0	39.2	35.5	32.9
20/06/11	20:35	00:05:00	49.9	67.9	29.0	62.4	50.7	39.6	31.1
20/06/11	20:40	00:05:00	47.1	67.4	26.8	58.9	46.6	34.6	28.9
20/06/11	20:45	00:05:00	41.2	59.4	26.6	51.8	45.1	31.0	28.5
20/06/11	20:50	00:05:00	48.0	67.0	26.7	58.7	52.4	37.0	29.6
20/06/11	20:55	00:05:00	47.4	64.7	27.5	60.0	47.5	35.9	31.4
<b>Mean Period:</b>			<b>50.4</b>						<b>31.5</b>
20/06/11	21:00	00:05:00	48.5	65.9	39.5	58.0	48.7	44.5	41.9
20/06/11	21:05	00:05:00	52.6	72.9	40.3	60.5	54.5	50.0	44.6
20/06/11	21:10	00:05:00	51.8	71.0	39.7	59.8	54.6	47.7	43.0
20/06/11	21:15	00:05:00	47.8	65.9	33.1	59.0	49.4	41.4	35.8
20/06/11	21:20	00:05:00	51.7	71.7	31.5	62.1	53.7	46.0	34.4
20/06/11	21:25	00:05:00	53.6	73.4	42.7	62.4	55.5	50.0	46.9
20/06/11	21:30	00:05:00	57.2	74.6	45.0	67.3	60.1	52.6	48.7
20/06/11	21:35	00:05:00	56.3	73.6	39.9	66.1	59.3	50.9	45.1
20/06/11	21:40	00:05:00	52.4	69.2	39.4	62.9	54.8	46.6	42.1
20/06/11	21:45	00:05:00	52.8	72.4	37.5	62.2	55.5	47.5	42.9
20/06/11	21:50	00:05:00	44.4	63.8	28.5	55.4	47.0	37.9	32.7
20/06/11	21:55	00:05:00	36.7	54.8	27.7	44.9	39.0	32.8	29.7
<b>Mean Period:</b>			<b>52.6</b>						<b>40.7</b>
20/06/11	22:00	00:05:00	43.4	61.4	29.4	51.1	47.7	38.7	33.6
20/06/11	22:05	00:05:00	41.7	56.8	30.1	53.2	43.3	37.4	33.4
20/06/11	22:10	00:05:00	46.0	62.6	28.2	59.7	46.4	38.4	32.4
20/06/11	22:15	00:05:00	47.7	63.4	28.5	61.3	49.3	38.1	32.2
20/06/11	22:20	00:05:00	46.9	63.6	30.4	59.8	46.5	39.2	34.4
20/06/11	22:25	00:05:00	44.4	60.4	29.0	55.5	46.1	40.0	34.6
20/06/11	22:30	00:05:00	43.3	59.6	28.7	55.2	45.5	38.6	34.2
20/06/11	22:35	00:05:00	50.4	64.1	30.5	61.0	54.3	42.6	36.7
20/06/11	22:40	00:05:00	43.2	56.2	30.9	52.3	45.4	40.6	35.9
20/06/11	22:45	00:05:00	38.0	50.8	29.3	43.8	40.8	36.2	32.2
20/06/11	22:50	00:05:00	42.7	58.4	28.9	56.2	43.8	36.3	31.9
20/06/11	22:55	00:05:00	46.4	66.6	28.9	54.8	39.9	34.6	31.4
<b>Mean Period:</b>			<b>45.6</b>						<b>33.6</b>
Date	Time	Run Time	Leq	Lmax	Lmin dB	L1 dB	L10 dB	L50 dB	L90 dB
20/06/11	23:00	00:05:00	39.8	57.0	26.0	52.9	41.7	31.5	28.7
20/06/11	23:05	00:05:00	47.1	66.7	25.8	61.2	41.7	30.2	27.8
20/06/11	23:10	00:05:00	45.0	61.8	25.1	56.8	45.7	33.5	27.2

20/06/11	23:15	00:05:00	39.8	59.0	24.7	54.1	39.0	27.2	25.7
20/06/11	23:20	00:05:00	39.6	58.8	24.6	53.2	36.1	27.0	25.5
20/06/11	23:25	00:05:00	29.0	46.4	24.9	34.3	29.9	27.5	26.0
20/06/11	23:30	00:05:00	34.2	58.0	24.9	44.5	33.6	27.7	26.0
20/06/11	23:35	00:05:00	30.6	47.7	24.9	39.0	32.6	28.1	26.5
20/06/11	23:40	00:05:00	41.1	70.1	25.5	47.5	41.4	29.7	27.2
20/06/11	23:45	00:05:00	46.3	66.7	25.6	57.9	36.6	28.9	26.9
20/06/11	23:50	00:05:00	32.1	53.8	25.7	39.1	32.6	29.5	27.5
20/06/11	23:55	00:05:00	31.1	48.3	25.4	39.4	32.4	29.1	27.4
<b>Mean Period:</b>			<b>41.6</b>						<b>26.9</b>
21/06/11	00:00	00:05:00	30.6	49.0	25.4	38.3	31.5	28.5	27.0
21/06/11	00:05	00:05:00	31.0	52.4	25.2	37.9	31.7	28.3	26.7
21/06/11	00:10	00:05:00	32.2	51.8	25.2	42.4	31.4	28.0	26.5
21/06/11	00:15	00:05:00	42.8	59.8	25.4	55.1	42.8	31.5	27.5
21/06/11	00:20	00:05:00	39.7	55.6	25.8	49.7	43.5	30.7	27.5
21/06/11	00:25	00:05:00	31.1	53.6	25.2	38.7	31.9	28.2	26.4
21/06/11	00:30	00:05:00	35.1	55.2	25.5	42.9	37.2	31.6	27.6
21/06/11	00:35	00:05:00	32.2	51.3	25.7	40.5	32.3	29.0	27.1
21/06/11	00:40	00:05:00	32.9	57.1	25.5	41.8	32.8	28.4	26.8
21/06/11	00:45	00:05:00	33.0	55.5	25.7	41.9	31.3	28.3	26.9
21/06/11	00:50	00:05:00	40.0	57.0	25.4	52.0	41.3	29.2	27.1
21/06/11	00:55	00:05:00	34.4	53.4	25.7	42.6	35.9	29.3	27.3
<b>Mean Period:</b>			<b>36.6</b>						<b>27.0</b>
21/06/11	01:00	00:05:00	33.2	53.4	25.3	43.1	32.7	28.7	27.0
21/06/11	01:05	00:05:00	31.5	49.1	25.5	41.3	32.6	28.5	26.9
21/06/11	01:10	00:05:00	35.9	54.7	26.6	47.3	36.3	31.1	28.2
21/06/11	01:15	00:05:00	41.6	60.3	26.9	52.8	39.5	31.6	29.2
21/06/11	01:20	00:05:00	43.1	59.0	26.3	54.7	45.9	31.2	28.4
21/06/11	01:25	00:05:00	37.1	56.6	26.4	48.1	37.1	30.6	28.2
21/06/11	01:30	00:05:00	32.4	48.9	25.8	42.0	33.6	28.9	27.5
21/06/11	01:35	00:05:00	35.2	54.8	27.0	45.8	35.6	30.5	28.9
21/06/11	01:40	00:05:00	35.5	52.7	26.1	45.9	36.5	30.3	28.4
21/06/11	01:45	00:05:00	32.6	54.2	25.8	43.4	30.7	28.5	27.2
21/06/11	01:50	00:05:00	30.5	43.5	26.0	38.0	32.2	28.8	27.3
21/06/11	01:55	00:05:00	39.0	54.8	25.7	48.9	42.8	30.4	27.2
<b>Mean Period:</b>			<b>37.5</b>						<b>27.9</b>
21/06/11	02:00	00:05:00	37.9	62.7	26.5	47.1	37.6	30.7	28.3
21/06/11	02:05	00:05:00	39.6	59.8	27.0	49.6	41.7	33.2	29.4
21/06/11	02:10	00:05:00	38.9	58.1	27.1	48.7	41.1	32.4	29.2
21/06/11	02:15	00:05:00	35.9	56.9	26.0	45.5	36.6	29.3	27.6
21/06/11	02:20	00:05:00	39.2	58.0	27.2	49.3	41.2	32.3	29.5
21/06/11	02:25	00:05:00	35.9	58.9	25.6	46.3	35.8	29.6	27.7
21/06/11	02:30	00:05:00	35.2	54.0	25.9	45.8	36.2	29.8	27.6
21/06/11	02:35	00:05:00	35.9	54.8	25.9	45.4	38.7	29.7	27.8
21/06/11	02:40	00:05:00	38.1	54.7	26.8	47.9	41.1	31.0	28.4
21/06/11	02:45	00:05:00	48.2	66.8	26.5	61.7	45.3	31.6	28.1
21/06/11	02:50	00:05:00	31.9	53.2	25.8	40.6	31.7	28.2	27.0
21/06/11	02:55	00:05:00	31.5	53.5	26.0	38.9	32.9	28.3	27.0
21/06/11	03:00	00:05:00	35.2	54.0	26.0	44.5	36.9	30.0	27.8

21/06/11	03:05	00:05:00	43.4	66.2	25.8	51.5	36.1	28.4	26.9
21/06/11	03:10	00:04:07	35.8	56.5	25.5	45.1	35.9	28.8	27.0
<b>Mean Period:</b>			<b>40.0</b>						<b>28.0</b>

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## APPENDIX 9 – PREDICTION METHOD

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### Computer Noise Model

Plant noise predictions have been undertaken using CadnaA noise modelling software, which incorporates prediction methodology within ISO 9613: 1993 Acoustics -- Attenuation of sound during propagation outdoors. The ISO 9613 method predicts a long-term equivalent continuous A-weighted sound pressure level ( $L_{Aeq}$ ) under meteorological conditions favourable to propagation at distances from a variety of sources of known emission. The method is defined for octave bands for 63 Hz to 8 kHz. The model assumes downwind propagation, within +/- 45 degrees of direction connecting dominant source and receiver, wind speeds between 1 and 5 m/s at heights between 3 and 11 m above the ground. The following parameters have been used within the modelling:

- Ground absorption = 0.1 for site, 0.8 for grass areas outside of site;
- All buildings reflective (0.37 absorption coefficient); and
- Atmospheric conditions = 0 degrees c, 50% humidity (representing the conditions during the night-time environmental survey).

Heights of buildings have been approximated from available online photography. Topographical data has been supplied by RSK Environment Ltd, including earthworks and landscaping proposed at the site.

### Noise Sources

#### *Generator Louvres*

The generators will be housed within an acoustic container and air supplied to the engines via containers on the louvers (the container louvers). These louvers will be built into the wall of the new building. Further louvers will be placed within the same wall to assist with airflow for cooling (building louvers).

Two vertical area sources (0.6m x 2.4m) have been used to model the container louvres on the container and two (1 x 6m and 1 x 3m) for the building louvers (assuming that the rooms shown on plan will not enclose the containers).

Noise levels have been based on data provided by Finning CAT (see **Appendix 7**). A noise level of 77 dB(A) 1 metre from the container louvres has been assumed representative. The sound spectrum measured at a similar generator at the Haughton Main site (see **Appendix 6**) has been used as a spectrum, which has then been adjusted to provide the required 77 dB(A). An attenuation of 10 dB has been assumed for the farm building louvres. This is estimate is based on attenuation of the louvre, attenuation of distance and also reflections within the farm building.

The verification of the sound source within the model to measured levels is as follows.

**Table A7.1 Calculations for Modelling Generator Noise**

MODELLED GENERATOR	Octave Band Sound Levels (dB)									Broadband (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Houghton Linear Measurement at 1m	75.7	73.5	77	72.4	63.7	59.2	53.6	47.8	50.6	81.2
A-weighted Houghton	36.3	47.3	60.9	63.8	60.5	59.2	54.8	48.8	49.5	67.9
Adjusted Measurement at 1m to Finning CAT specification	45.4	56.4	70.0	72.9	69.6	68.3	63.9	57.9	58.6	77.0
Modelled Source Level at 1m	45.3	56.3	69.8	72.8	69.8	68.3	63.7	57.7	58.6	76.9
Difference	-0.1	-0.1	-0.2	-0.1	0.2	0.0	-0.2	-0.2	0.0	-0.1

*Gas Processing*

The gas processing equipment has been modelled as a set of pipework and two dominating emission points (1 at 1.8 m height and 1 at 2.8 m).

Noise levels have been based on data provided by Acoustic Associates for similar gas plant of 67 dB(A) at 10 metres (Noise Assessment of Electricity From Mine Gas at Houghton Main, AAL/BS0531).

The verification of the sound source within the model to measured levels is as follows.

**Table A7.2 Calculations for Modelling Gas Processing Noise**

MODELLED GENERATOR	Octave Band Sound Levels (dB)									Broadband (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Houghton Linear Data at 10m	-	67	69	71	65	61	59	58	45	75.0
A-weighted at 10m	-	40.8	52.9	62.4	61.8	61	60.2	59	43.9	68.2
Corrected to 67 dB at 10m	-	39.8	51.9	61.4	60.8	60	59.2	58	42.9	67.2
Modelled Source Level at 10m	-	39.7	51.6	61.1	60.6	59.6	59	57.8	42.9	66.9
Difference	-	-0.1	-0.3	-0.3	-0.2	-0.4	-0.2	-0.2	0	-0.3

It was noted that the noise level at 1 m of 74 dB(A) also matches the noise level measured at the Houghton site for the gas processing area.

*Fan Cooled Radiator*

The fan cooled radiator has been modelled as a set of 6 point sources at a height of 1.8 m with a directivity dominating in the z plane such that the noise emitting from the top of the fans is 10 dB higher than the side where the point sources have been verified to measurement data.

The noise level and sound spectrum for the fans have been based on data provided by measurements taken at the Houghton Main site at 1 m.

The verification of the sound source within the model to measured levels is as follows.

**Table A7.3 Calculations for Modelling Fan Cooled Radiator Noise**

MODELLED GENERATOR	Octave Band Sound Levels (dB)									Broadband (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Houghton Linear Measurement at 1m	75.2	82.1	81.6	80.4	75.8	72.3	67.8	60.1	51.2	87.1
A-weighted at 1m	35.8	55.9	65.5	71.8	72.6	72.3	69	61.1	50.1	78.0
Modelled Source Level at 1m	36	56	65.5	71.9	72.4	72.4	69	61.4	50.2	78.0
Difference	0.2	0.1	0.0	0.1	-0.2	0.1	0.0	0.3	0.1	0.0

### Transformers

The noise level for the two transformers has been based on RSK's experience of transformer noise. The noise level used for the transformer is as follows.

**Table A7.4 Modelled Transformer Noise**

MODELLED GENERATOR	Octave Band Sound Levels (dB)									Broadband (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Sound Levels	-	50.8	61.3	70.3	70.6	67.3	63.2	57.5	52	75

It is noted that the noise survey undertaken at the Houghton Main site does not make reference to transformer noise, even 1m from a transformer. It is therefore considered likely that the noise level of the transformer is not a significant noise source.

### Generator Exhaust Gas Maximum Limit Calculation

As a worst case scenario, the calculation to provide a maximum sound pressure level limit at 1m from the exhaust stack utilises distance attenuation only (in reality ground and air absorption will also increase attenuation of sound). The calculation is as follows:

- Predicted noise level of all other equipment at nearest receptor (Wellfield Farm) = 30 dB(A)
- Noise target at receptor to avoid contribution of sound from exhaust stack = 20 dB(A)
- Distance to nearest receptor = 265m
- Distance attenuation =  $20 \times \text{LOG}_{10} (1/265) = -48.5 \text{ dB}$
- Maximum exhaust noise level at 1m =  $20 \text{ dB} + 48.5 \text{ dB} = \mathbf{68.5 \text{ dB(A)}}$ .