



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

Design and Access Statement

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CONTENTS

1	INTRODUCTION.....	1
1.1	Background to the Design and Access Statement.....	1
2	OVERVIEW OF THE EXISTING ENVIRONMENT	3
2.1	Site Location and Local Context	3
3	THE PROPOSED SCHEME	4
3.1	Summary of the Proposals	4
3.2	Key Components	4
4	DESIGN AND DEVELOPMENT CONSIDERATIONS.....	7
4.1	Design Considerations.....	7
4.2	Access.....	8
4.3	Use	8
4.4	Amount.....	9
4.5	Layout.....	9
4.6	Scale	9
4.7	Appearance	9
4.8	Landscaping.....	10
5	SUMMARY	11
5.1	Conclusions	11

1 INTRODUCTION

1.1 Background to the Design and Access Statement

- 1.1.1 This Design and Access Statement (the Statement) accompanies a planning application submitted by RSK Environment Ltd on behalf of Seven Star Natural Gas Limited (the applicant) for proposals to harness and utilise underground methane gas to generate electricity using gas to power technology (the proposed scheme) on land at Three Nooks Farm in Horton, Leek (the site).
- 1.1.2 Seven Star Natural Gas Limited is a wholly owned subsidiary of Alkane Energy plc, a market leader in the UK gas-to-power market.
- 1.1.3 The purpose of this Statement is to demonstrate the design process that has been followed during the development of the proposed scheme. It explains the principles and concepts that have influenced the final form and appearance of the proposed scheme, and provides a tool to communicate how the objectives of good design and access provision have been considered and achieved.
- 1.1.4 This Statement has been prepared to satisfy the Town and Country Planning (General Development Procedure) Order 1995 (as amended), which sets out the legislative requirements for Design and Access Statements for certain types of planning applications.
- 1.1.5 The preparation of this Statement has taken account of published guidance and advice contained in: Guidance on Information Requirements and Validation, published by the Department for Communities and Local Government (2010); and Design and Access Statements – How to write, read and use them, published by CABE (2006).
- 1.1.6 This Statement is structured in the following manner.
- **Section 1** describes the background and purpose of this Design and Access Statement.
 - **Section 2** gives a brief overview of the development site and the surrounding local environment.
 - **Section 3** provides a summary of the proposed scheme and its key components.
 - **Section 4** outlines the design and access principles and considerations that have been taken into account as part of the development process, with specific focus on:
 - Access: How the development will be accessed.
 - Use: How the understanding of the physical, economic and social context of the local environment has been considered in relation to the use of the proposed scheme.
 - Amount: How much development is being proposed.
 - Layout: How buildings, routes and spaces have been provided in the proposed scheme, and their relationship to each other and features in the local surroundings.
 - Scale: How the proposed scheme relates to its surroundings in terms of height, width and lengths of buildings.

- Appearance: How the aspect of a place or building has determined the external built form of the proposed scheme, its architecture, materials, finish and texture.
 - Landscaping: How hard and soft landscape treatments have been applied to the proposed scheme to enhance and/or protect local amenity, and to achieve landscape integration.
 - **Section 5** summarises and concludes the above.
- 1.1.7 The content of this Statement has been informed by detailed consultation with Staffordshire County Council, landowners, relevant statutory and non-statutory bodies, interest groups, and the outcomes of various environmental studies and appraisals undertaken at the site.
- 1.1.8 Reference should be made to the Planning Statement for full details of the proposed scheme and the local environment.

2 OVERVIEW OF THE EXISTING ENVIRONMENT

2.1 Site Location and Local Context

- 2.1.1 The address of the site is: Three Nooks Farm, Horton, Leek, Staffordshire, ST13 8QT (grid ref: E391507 N357890). The site location is depicted on **Figure 1** of the Planning Statement.
- 2.1.2 The site falls entirely within the jurisdiction of Staffordshire County Council (SCC) and Staffordshire Moorlands District Council, and is positioned at the top of an open moorland ridge at around 300m AOD.
- 2.1.3 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.
- 2.1.4 Three Nooks Farm is currently managed as a working dairy farm with a 150 strong dairy herd, and is accessed from C173 Top Road/Lask Edge Road via an existing concrete driveway. Existing buildings comprise a farmhouse (a two-storey detached dwelling), and several agricultural sheds and barns used as milking parlours and for equipment storage.
- 2.1.5 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.
- 2.1.6 Rural areas surrounding the site are interspersed with isolated farm dwellings, outbuildings and residential properties, many of which are generally accessed via farm tracks off the local road network.
- 2.1.7 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. A single PRoW (Horton 21) crosses the site in a north-west to south-easterly direction.
- 2.1.8 The site is located in the North Staffordshire Green Belt and within a designated Special Landscape Area, and is visible to a limited number of residential dwellings that overlook the site.

3 THE PROPOSED SCHEME

3.1 Summary of the Proposals

- 3.1.1 A full description of the proposed scheme and background context is set out in the Planning Statement that accompanies the planning application. To avoid repetition, a brief summary of the proposals is provided below.
- 3.1.2 The proposed scheme forms the second of a planned two-phase development at the site.
- **Phase 1** involves: the undertaking of essential drilling and repair works to two existing abandoned boreholes drilled in the 1980s by Shell; testing and appraisal of the natural gas (methane) reservoir at the site to determine quantity and quality; the plugging and abandonment of the 'Nooks Farm 1' borehole; and the fitting of a wellhead valve arrangement to the 'Nooks Farm 1A' borehole.
 - **Phase 2** will involve: the demolition of an existing agricultural barn; construction of a new purpose built barn on the site of the existing barn (shared between the applicant and the farmer) to accommodate gas-powered electricity generating plant; construction of ancillary equipment external to the barn; construction of a new silage clamp to contain the farmer's cattle feed storage; and the laying of service pipes, distribution pipes and other infrastructure to provide essential connections to the wellhead valve and the local electricity network.
- 3.1.3 An application for the Phase 1 works was submitted to SCC in December 2011 and approved by way of planning committee decision in April 2012. Phase 1 is currently being implemented by the applicant ahead of a decision on a planning application for the Phase 2 works, to which this Statement specifically relates.
- 3.1.4 Subject to the granting of planning consent, the applicant plans to commence construction of the proposed scheme in April 2013, lasting for a duration of approximately 9 months.
- 3.1.5 The facility is planned to be fully operational by the end of 2013.

3.2 Key Components

- 3.2.1 The proposed scheme layout is depicted on **Figures 4 to 14** of the Planning Statement, and comprises the following key components.

Barn

- 3.2.2 A review was undertaken of an existing agricultural barn within the farmyard to determine its suitability for upgrading and reuse. Discussions with the farmer revealed the barn to be some 50 years old, and neither of suitable construction or condition to meet the requirements of the project. Accordingly, this existing agricultural barn within the farm will be demolished to allow the erection of a new purpose built barn on a broadly similar footprint.
- 3.2.3 The new barn will be shared between the farmer and the application, and will be used to contain the following equipment.
- 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.

3.2.4 The farmer's section of the barn will provide space and facilities for the storage of feed, equipment and the over-wintering of cattle.

External Equipment

3.2.5 External equipment will be sited adjacent to the new barn and will comprise: gas processing equipment; fan cooled radiators; electrical transformers; pipework; and cable ducting.

Silage Clamp

3.2.6 A new silage clamp will be constructed to the rear of the new barn and associated external plant. This is necessary as an existing silage clamp is located where the external equipment is to be positioned.

3.2.7 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.

3.2.8 The clamp will be formed by precast concrete panel walls and steel columns which will securely hold the silage in place, and will be split into two sections to permit the farmer flexibility in silage management.

3.2.9 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

3.2.10 A new underground gas pipe will be installed to connect the wellhead (installed as part of Phase 1) to the externally sited gas processing equipment.

3.2.11 The valves installed at the wellhead will generally be contained within the cellar below ground level, with the buried pipeline running between the wellhead and the silage clamp. This will enter the farmyard external equipment compound north of the new silage clamp.

Utility and Other Connections

3.2.12 An 11kV underground electricity cable will connect the generating equipment within the barn to the local electricity network. Liaison between the applicant and Western Power Distribution has identified a potential connection point in Biddulph Moor (Ridgefields). A final decision on the exact route of the cable will be made by Western Power Distribution, and only subject to the granting of planning consent for the proposed scheme.

3.2.13 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.

- 3.2.14 Seven Trent Water will install a connection to the new agricultural 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, and strip drains will be installed to control silage runoff.
- 3.2.15 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.

4 DESIGN AND DEVELOPMENT CONSIDERATIONS

4.1 Design Considerations

- 4.1.1 Various design challenges have been taken into account when developing the proposed scheme, the key aim being to develop a facility that meets operational requirements in a compact, safe, and environmentally friendly manner.
- 4.1.2 Site selection has been informed by the confirmed presence of viable gas reserves at Three Nooks Farm, and the availability of land within the farm holding to accommodate the necessary plant and infrastructure required to harness, extract and convert this natural resource into electricity.
- 4.1.3 Key considerations, constraints and opportunities taken account of in the design development process have included:
- Assessing the suitability of existing buildings and structures within the farm to accommodate parts of the project.
 - Ensuring sufficient landtake to meet the minimum engineering, operational and safety requirements, whilst ensuring farming regimes and storage requirements are maintained.
 - Allowing adequate separation distances between the site and neighbouring environmental sensitivities (e.g. boundary vegetation).
 - A preference to utilise the existing farm entrance and driveway for both construction and operational access, and use of a haul route for construction traffic previously identified at the Phase 1 stage.
 - Utilisation of existing unoccupied areas of hardstanding within the farm curtilage to provide temporary laydown areas and vehicle parking during the construction phase.
 - A need to locate some of the generating equipment both within a contained environment and externally.
 - Resolution of conflicts between the proposed scheme elements and existing uses within the site (e.g. timing of construction operations).
 - The presence or absence of planning and environmental designations across the site.
 - Avoidance and reduction of environmental impacts through development and inclusion of appropriate mitigation measures into the overall project design.
- 4.1.4 Pre-application consultation was undertaken with SCC's planning and landscape officers, leading to a number of design recommendations being made. These have accordingly been incorporated into the final design of the project, where possible.
- 4.1.5 The final design presents a considered and comprehensive design solution which takes account of: local site context, constraints and opportunities; stakeholder responses; planning policy objectives; and the outcomes of various environmental appraisals undertaken to inform the planning application (e.g. landscape, visual and ecological surveys).

- 4.1.6 It is a design that is comparable to similar development models which have evolved over the last 15 years, and which have been successfully implemented at a number of gas-bearing sites comparable to Three Nooks Farm.

4.2 Access

- 4.2.1 The existing farm entrance and driveway have been upgraded to take HGVs and construction vehicles as part of a consented works detailed within application references SM.10/06/161 M and SM.11/18/161 M.
- 4.2.2 Construction 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.
- 4.2.3 This haul route was already established as appropriate to meet the requirements of the project during Phase 1. No modifications to the local highway, entrance or farm access tracks will be required to enable the proposed Phase 2 works to proceed.
- 4.2.4 Vehicles will temporarily park in front of the farmhouse to allow plant and machinery full access across the farmyard to undertake preparatory and enabling works (e.g. demolition of the existing barn). A dedicated car parking area within the farm will then be established for vehicles.
- 4.2.5 Access to all components associated with the proposed scheme will be via the existing farmyard, and an existing field access track installed during Phase 1 of the works.
- 4.2.6 The generating equipment will be accessed by two metal shutter doors 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. 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, and will be fitted out by the farmer to suit his operational requirements. Both the north and south elevations of the barn will be accessible by either a single or double side door.
- 4.2.7 The new silage clamp will be accessible by tractor from the existing farmyard.
- 4.2.8 Public access along Horton 21 ProW will be maintained throughout the construction and operational phases of the project.
- 4.2.9 Due to health and safety considerations, only site operatives and other competent personnel will be allowed access to the equipment.

4.3 Use

- 4.3.1 The new barn will be shared between the applicant and the farmer. The applicant's electricity generating plant, associated switchgear and controls will 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 adjacent grazing fields.
- 4.3.2 Based on forecasts of available gas reserves at the site, the generation of electricity will be carried out 24 hours a day, 7 days a week over an estimated 20 year period, and will be sold by the applicant to local distribution network.

- 4.3.3 The entire facility has been designed to run automatically without the need for operational staff to be permanently based on site, save for occasional maintenance or repair works as and when required.

4.4 Amount

- 4.4.1 The planning application boundary totals 1.9902ha of land, and includes all land required to construct and accommodate the proposed scheme. This area has been governed by a need to provide sufficient space to safely and efficiently operate all plant, infrastructure and equipment.
- 4.4.2 Although no works will be undertaken to the existing farm driveway, the planning application boundary includes this element given it forms the only means of access to and from the site.

4.5 Layout

- 4.5.1 It has been agreed with the farmer that an area of farmyard currently accommodating his silage will need to be used for the siting of external equipment. A new silage clamp will therefore be constructed behind this equipment and the new barn, and will be set within a purpose built area enclosed by precast concrete retaining walls.
- 4.5.2 The layout of the proposed scheme accordingly reflects the minimum spatial and operational requirements for the farmer's dairy herd and implement storage, and stakeholder comments regarding to its final form, appearance and external finish.

4.6 Scale

- 4.6.1 The new barn will be of comparable dimensions and scale to existing agricultural buildings at Three Nooks Farm and the local area, and will be of approximate dimensions 33.97m length x 25.62m depth x 8.477m high (to ridgeline from lowest ground level). The total footprint of the barn will be approximately 870m²; some 617m² of which will be set aside for the farmer to use.
- 4.6.2 The total footprint of the external generating equipment area will be approximately 225m².
- 4.6.3 The storage area of the new silage clamp will cover approximately 1058m² and will be split into two sections to permit the farmer flexibility in silage management. The retaining walls of the clamp will be some 3.3m high.
- 4.6.4 The underground gas pipeline will be some 300m in length, of diameter no greater than 150mm, and buried to a depth of 0.75m.

4.7 Appearance

- 4.7.1 The external appearance of the proposed scheme has been driven by a need to achieve the desired functionality whilst giving due regard to the overall rural character of the local environment.
- 4.7.2 A reinforced concrete slab will be constructed and laid to form the base of the new barn. The lower sections of the new barn walls will be constructed of exposed concrete blockwork. Upper sections will be formed around a steel frame infilled with Yorkshire boarding to provide a recessive finish. The western side of the barn will also incorporate an acoustic block wall inside the Yorkshire boarding to provide noise attenuation.

- 4.7.3 The roof of the barn will form an apex and 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.
- 4.7.4 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.
- 4.7.5 All external generating equipment will be securely contained by a 2.4m high chainlink fence, finished in black.
- 4.7.6 The existing silage clamp will be relocated to the rear of the new barn and associated external plant, and will be contained by precast concrete walls set within steel framework to securely hold the winter feed in place. Safety rails will be fitted to the upper sections of the retaining walls. The base of the clamp will also be formed by concrete.

4.8 Landscaping

- 4.8.1 Landscaping has been incorporated into the overall design of the project to assist in the visual integration of the new barn and silage clamp into the wider landscape pattern, and to provide a degree of visual screening from properties to the north-west of the site.
- 4.8.2 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.
- 4.8.3 Mounding will provide some 3 – 4 m additional height over existing ground levels, and will be planted up with an appropriate mix of tree and shrub species which 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.
- 4.8.4 A post and wire fence will be installed to provide separation for users of Horton 21 ProW from the silage clamp.
- 4.8.5 Disturbed areas within the farmyard will be resurfaced with concrete, and root protection measures will be installed to protect existing vegetation from construction damage where necessary.
- 4.8.6 A long term strategy for the restoration of the site and wider surroundings has been included for within the planning application.

5 SUMMARY

5.1 Conclusions

- 5.1.1 This Statement has set out the key aims, principles and concepts which underpin the design of the proposed scheme.
- 5.1.2 The design of the proposed scheme has been developed to be contained within the curtilage of Three Nooks Farm, and to meet both the operational requirements of the applicant and the farmer.
- 5.1.3 The scale and appearance of the proposed scheme achieves high standards of design that reflect the rural nature of the receiving environment. Planting incorporated into the overall design will ensure the various project components successfully integrate with the local landscape pattern over time.
- 5.1.4 There will be no requirement for public access to the site, and appropriate security controls will be installed to prevent unauthorised access to the generating equipment.