Ebberston Moor Early Development Scheme (EDS), Ebberston, Snainton, North Yorkshire

Environmental Statement Addendum

Non-Technical Summary

Issue/Revision	Draft	Final
Date	November 2013	November 2013
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Checked by	Lucy Wood	Lucy Wood
Project Reference	19819/A5/ES Addendum NTS 2013	

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Ref: 19819/A5/ES Addendum NTS 2013
Date: November 2013

1.0 INTRODUCTION

1.1 A full planning application ~~is being~~ **was** submitted on behalf of Viking UK Gas Limited (the "Applicant") **in July 2013** to seek permission for the exploitation of conventional hydrocarbon resources only, for an operational period up to five years, including: gas production from one wellhead at the existing Ebberston Moor 'A' Well Site; piping the produced gas to the adjoining Lockton Compound where the gas would be conditioned; injecting the conditioned gas via an existing Above Ground Installation (AGI) connection to a Northern Gas Network (NGN) pipeline that runs between Pickering and Whitby; and creation of two new access points off Ebberston Common Lane. These activities are collectively referred to hereafter as the "Proposed Development" on land on the edge of the Dalby Forest in the North York Moors National Park[1] ("the Assessment Site").

1.2 **Figures 1.1** and **1.2** show the location and extent of the Assessment Site. It falls within the administrative area of North York Moors National Park Authority (NYMNPA) who are also the minerals planning authority (the decision maker) for this application.

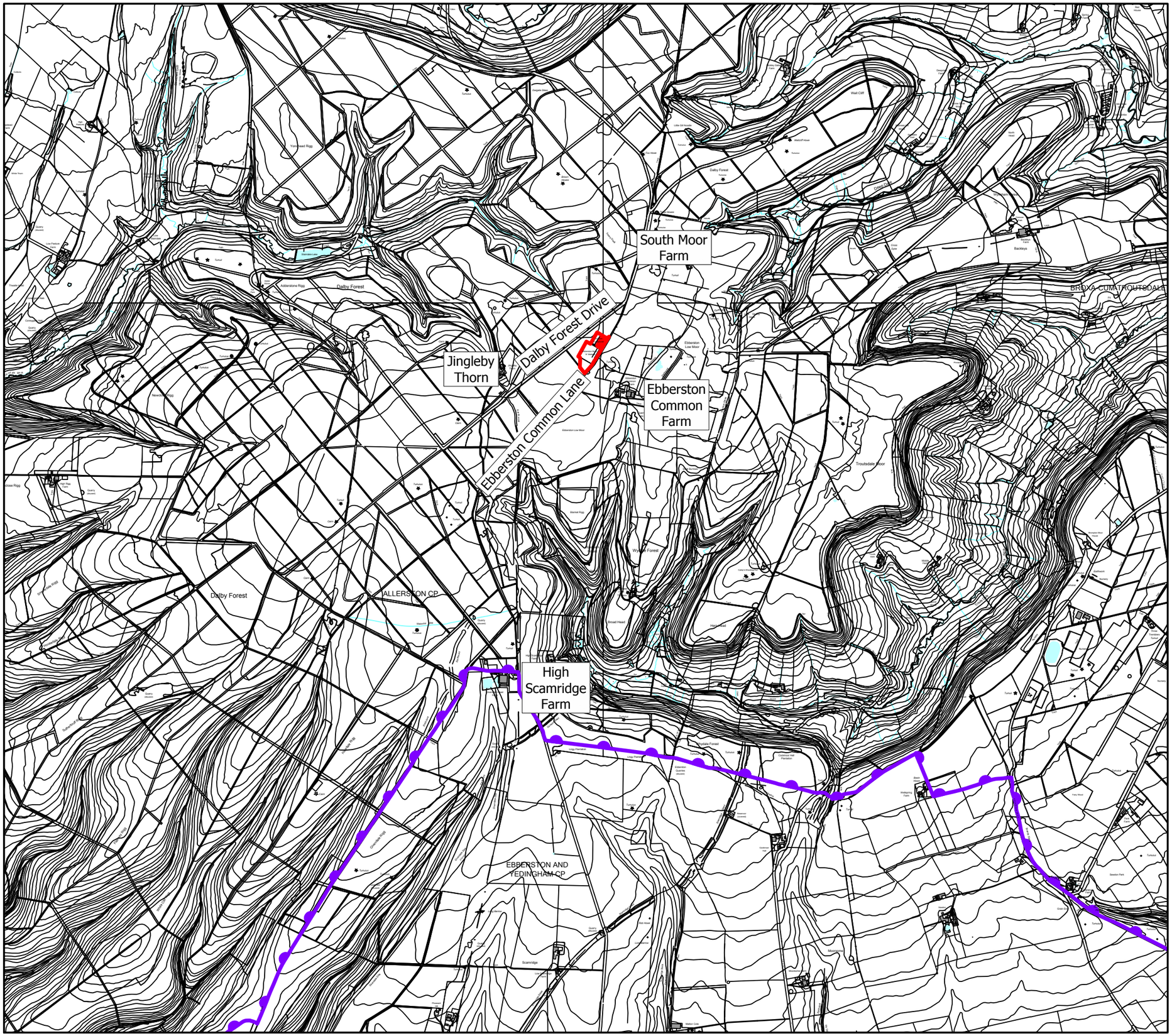
1.3 The Environmental Statement (ES) presents the findings of an Environmental Impact Assessment[2] (EIA) for the Proposed Development.

1.4 ~~The full findings of the ES are presented in a comprehensive set of documents that can be viewed at North York Moors National Park Authority, The Old Vickerage, Bondgate, Helmsley, York, YO62 5BP. Copies of the ES, Technical Appendices and NTS can be obtained on CD for £20. In addition hard copies of the Non-Technical Summary can be obtained free of charge from Paul Foster, Barton Willmore LLP, Elizabeth House, 1 High Street, Chesterton, Cambridge, CB4 1WB.~~

Background to the ES Addendum and NTS Addendum

1.4a At the time of the submission in July 2013, it was made clear in the ES that a separate planning application would be submitted to the NYMNPA at a later date for the injection of produced water into the Sherwood Sandstone. Since that time, the Applicant and its advisors have made considerable progress in agreeing the technical process of water injection with the Environment Agency. Consequently, it is now possible to submit additional information about injection of the injection of the produced water into the Sherwood Sandstone within the Planning

[1] A national park is an area designated for its special qualities and landscape rich in character and distinctiveness, wildlife, history and heritage.
[2] Prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011



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LEGEND

- Assessment Site Boundary
- Boundary of North York Moors National Park

Figure 1.1

Project
Ebberston Moor EDS, North Yorkshire

Drawing Title
Site Location Plan

Date	Scale	Drawn by	Check by
03.07.2013	1:25,000 @A3	ML	MC

Project No	Drawing No	Revision
19819	E002	A

0 200 400 600 800 1000m

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K:\19000-19999\19800-19899\19819 - Knapton\A4 - Dwgs & Registers\EIA\19819 E002 Site Location.dwg - A3

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Revision		Date	Drn	Ckd
A	Existing layout amended	04.06.13	SJ/RP	NC
B	Existing notation amended	18.06.13	SJ/RP	NC
C	Boundary line amended	20.06.13	SJ/RP	NC
D	Redrawn to topo survey	26.06.13	SJ/RP	NC
F	Existing pipes shown	09.07.13	SJ/RP	NC
G	Landscaping amended	10.07.13	SJ/RP	NC

Existing Mature Woodland

Existing Mature Woodland

DALBY FOREST DRIVE

E D

Existing Mature Woodland

C

A

1 7

Ebberston Moor Wellsite

Existing Mature Woodland

B

Lockton Compound

B

PATH

A

6

5

2

4

3

B

A

EBBERSTON COMMON LANE

E D

C

Existing NGN 8" Pipeline to Pickering

Existing NGN 6" Pipeline to Whitby

0 10 20 30m

EXISTING PLANTATION WITH ENRICHMENT PLANTING - REGENERATION PHASE MONITORED OVER 5-10YRS

EXISTING FENCE

SUBSOIL BUND (approx. 2300m³)
FORMED AT MAXIMUM GRADIENT OF 1:3 TO 3m IN HEIGHT

TOPSOIL BUND (approx. 1300m³)
FORMED AT MAXIMUM GRADIENT OF 1:3 TO 2m IN HEIGHT

EXISTING TREES

EXISTING GROUND COVER

EXISTING HEDGE

EXISTING STRUCTURAL PLANTING

1 Existing Gas Well
2 Existing NGN Building
3 Existing Car Parking 11 spaces
4 Existing NGN Entrance
5 Existing LTZ Pipe manifold
6 Existing Well site Entrance
7 Existing Drilling Cellars

Site Boundary 21,604 sqm

Well Site Area A - 11,000 sqm

Lockton Site Area B - 2,387 sqm

Flare site area = 4,323 sqm

Figure 1.2

Project
EBBERSTON EDS

Drawing Title
EXISTING SITE LAYOUT

Date	Scale	Drawn by	Check by
June 2013	1:500@A1	SJ/RP	NC

Project No	Drawing No	Revision
19819	P_03	G

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Application instead of it forming the subject of a separate planning application as discussed originally.

1.4b This document updates the Environmental Statement Non-Technical Summary (NTS) to account for the changes to the Proposed Development and assessment of likely significant effects on the environment as a result of the inclusion of the disposal of the produced water.

Availability of the ES Addendum and NTS Addendum

1.4c Additional copies of the ES Addendum and the NTS Addendum are available for viewing by the public during normal office hours in the planning department of NYMNPA. Comments on ES Addendum and the NTS Addendum should be sent to the address below:

North York Moors National Park Authority
The Old Vicarage
Bondgate
Helmsley
York
YO62 5BP

Tel: 01439 772700
Email: planning@northyorkmoors.org.uk

1.4d Additional paper copies of the ES Addendum and NTS Addendum can be purchased at a cost of £75. The NTS Addendum can be obtained free of charge. Copies of the ES Addendum and NTS Addendum can be obtained on CD for £20. All documents are available from:

Paul Foster
Barton Willmore LLP
St Andrews House
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Background to the Project

1.5 The Ebberston Moor gas field (originally called Lockton) was discovered in 1966 and produced gas between May 1971 and 1974. Since the 1970s, further discoveries of gas have been made in the area. Interpretation of seismic data[3] acquired by the Applicant for the fields shows that large areas of gas remain un-tapped, while further studies have improved the understanding of the reservoir's behaviour.

1.6 Whilst, inevitably, there is still a degree of uncertainty about the scale of recoverable gas reserves, the Applicant wishes to pursue a phased approach to the development of the Ebberston Moor gas field. This phased approach will help to:

- Ensure a clearer understanding of the production performance and recovery from the gas field;
- Minimise economic risk and mitigate any adverse effects on the local environment;
- Establish early production; and
- Increase the availability of gas to the local supply network.

1.7 The well site was first approved in 2006 and reprofiled in 2008. A further permission was granted to retain the existing well site in 2011. Planning permission was then granted by the NYMNPA on 18 June 2013 to drill a side track from the existing well within Ebberston Moor 'A' Well Site and the drilling of up two additional appraisal boreholes.

1.8 The side track from the existing well will be drilled prior to construction commencing for this Proposed Development. **The second borehole will be used for injecting the produced water into the Triassic Sherwood Sandstone rock layer beneath the well site**. ~~In addition separate planning permission will be sought to use the existing well cellar to drill a borehole for water disposal use, if required at a later date.~~

1.9 This Proposed Development seeks planning permission to use the existing Lockton gas export pipeline, now part of the Local Transmission Zone (LTZ) pipeline infrastructure, and use part of the Lockton Compound adjacent to the Ebberston Moor 'A' Well Site, in order to accommodate the gas conditioning and metering equipment. The Proposed Development will enable medium term production performance of the Ebberston Moor gas reservoir to be assessed, with the aim of proving reservoir volumes sufficient to support investment in future field development.

[3] Seismic data originates from surveys that investigate subterranean rock structures to provide a picture of underground rock structures that may yield petroleum, minerals and ores of economic value.

1.10 If future field development is deemed viable, the second phase of the development would involve the construction of a pipeline between Ebberston Moor 'A' Well Site and Knapton Generating Station (KGS) to allow sour gas produced on the well site to be transported to KGS. The second phase of field development will form a separate project and the basis of a separate planning application and will not be assessed further within the ES accompanying this planning application.

Description of the Area Surrounding the Assessment Site

1.11 The Assessment Site, shown on **Figures 1.1** and **1.2** is located within the North York Moors National Park. It is approximately 12 km northeast of Pickering and 14 km west of Scarborough at an elevation of approximately 245m AOD. The Assessment Site comprises the existing Ebberston Moor 'A' Well Site and part of the Lockton Compound and is located on the eastern edge of Dalby Forest within an area referred to as the Tabular Hills. The Assessment Site is surrounded to the north, west and south by mature forestry plantation. The eastern boundary of the Assessment Site is defined by Ebberston Common Lane. Beyond Ebberston Common Lane to the east the land comprises farmland with hedge and fence lined grazing fields.

1.12 Notable features within the vicinity of the Assessment Site include: North York Moors National Park; Dalby Forest; Tabular Hills Walk; various Scheduled Monuments[4]; South Moor Farm; and nearby unmarked roads and Public Rights of Way.

Description of the Assessment Site

1.13 The Assessment Site presently consists of a modified area of land associated with previous gas exploration activity on Ebberston Moor 'A' Well Site and the adjacent Lockton Compound covering a total area of approximately 2.16 hectares (ha) as shown in **Figure 1.2**.

Ebberston Moor 'A' Well Site

1.14 The Ebberston Moor 'A' Well Site contains, a 0.66 ha area of flat bare ground (drilling platform), an existing borehole with an associated wellhead (Ebberston Moor – 1 well) and a well cellar adjacent to the wellhead in the centre of the well site. The well site is covered with crushed hardcore which is placed over a geotextile membrane and an impermeable bentonite mat and connected into a lined perimeter drainage ditch. Soil bunds of between

[4] A scheduled monument is a 'nationally important' archaeological site or historic building, given protection against unauthorized change

2m and 4 m in height are located between the drainage ditch and perimeter fence along the western and southern perimeter of the well site. The bunds comprise a mixture of previously excavated superficial soil and weathered bedrock. The surfaces of the bunds are vegetated with coarse grass and brush. In total the area of the well site including the bunds is 1.1 ha.

Lockton Compound

1.15 The adjacent Lockton Compound contains a 0.24 ha area of flat bare ground covered with crushed hardcore bound by a wire mesh and concrete post perimeter fencing approximately 2m high capped with barbed wire. Along the south eastern section of the compound are located a small area of concrete hardstanding, a section of above ground pipework and a small concrete building owned and managed by NGN. These structures are associated with the existing Above Ground Installation (AGI) connection to a Northern Gas Network (NGN) pipeline that runs between Pickering and Whitby. The area within the Lockton Compound but outside of the Assessment Site is hereafter referred to as the NGN AGI. The Lockton Compound is separated from Ebberston Common Lane and Dalby Forest Road by existing trees and other vegetation.

2.0 ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

Assessment Methodology

2.1 Environmental Impact Assessment (EIA) is a systematic procedure that uses best practicable techniques and available sources of information to determine the potential environmental effects of a development (beneficial, adverse, negligible, temporary, permanent, direct, indirect, cumulative and interactive). This enables the importance of predicted effects to be considered by a local planning authority (in this case NYMNPA) before a decision is made about the planning application. The prediction of such effects for the Proposed Development was made in relation to the construction, operation, and decommissioning and restoration phases of the Proposed Development.

2.2 Within the ES the significance of an environmental effect has been identified. The significance reflects the relationship between:

- The sensitivity, importance or value of the affected resource or 'receptor' (such as people or wildlife); and
- The actual change taking place to the environment (i.e. the 'magnitude' or severity of an effect).

2.3 The three levels of significance defined are:

- Major – an effect which, on its own, could have an influence on the decision making process;
- Moderate – an effect which, on its own, could have some influence on decision making, particularly when combined with other similar effects; or
- Minor – an effect which, on its own, is likely to have a minor influence on decision making but when combined with other effects could have greater influence.

2.4 **Table 1** shows the relationship between the value of the receptor and the magnitude of an effect used to determine the significance of an effect.

Table 1: Significance Matrix

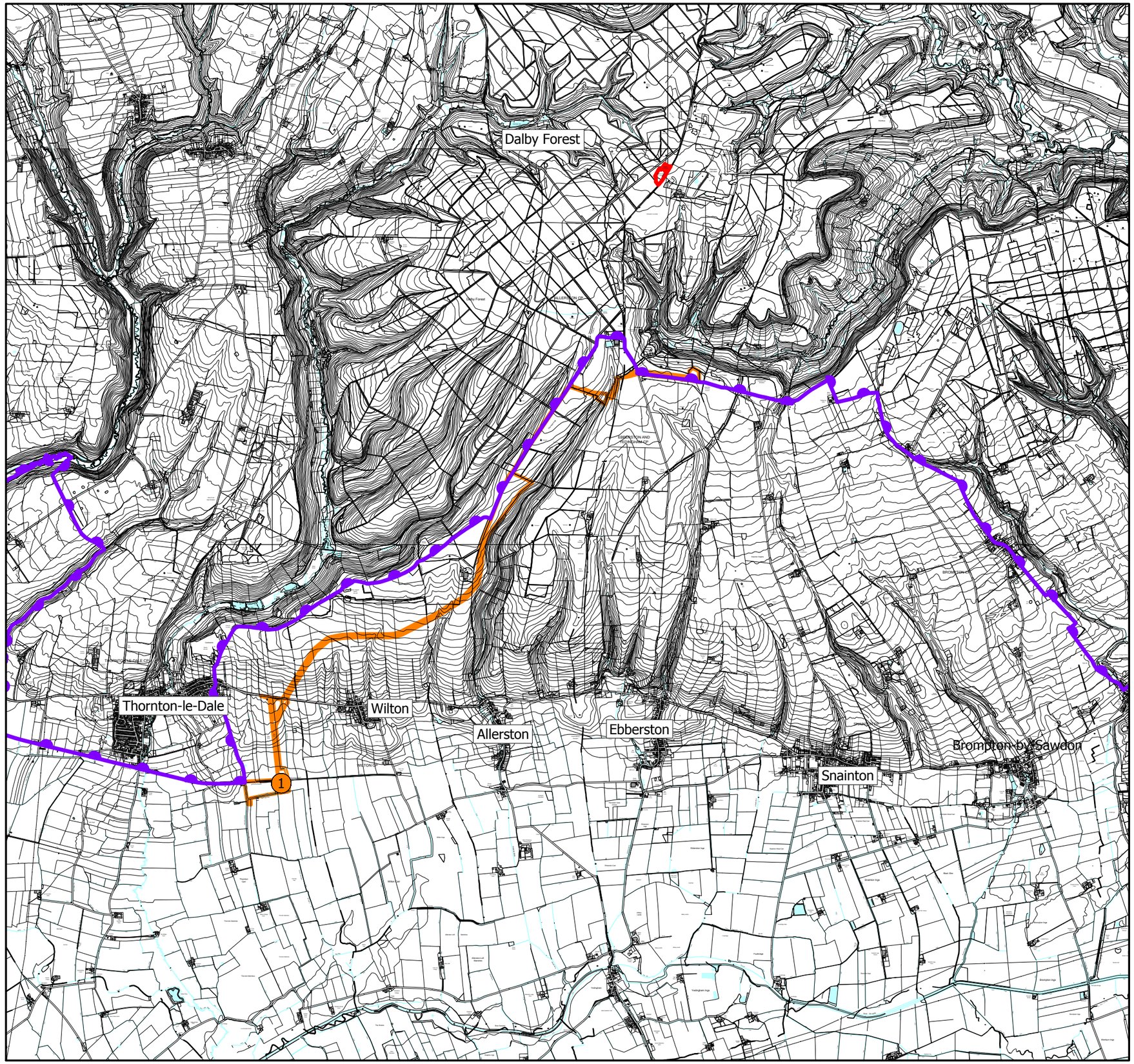
Sensitivity/Value of Receptor	Magnitude of Effect		
	High	**Medium**	**Low**
High (England, UK, International)	Major	Major/ Moderate	Moderate
Medium (County, Regional)	Major/ Moderate	Moderate	Moderate/ Minor
Low (Local, District)	Moderate	Moderate/ Minor	Minor

2.5 Effects are also described as: Adverse i.e. detrimental or negative effects to an environmental resource or receptor; or Beneficial i.e. advantageous or positive effect to an environmental resource or receptor. Where an effect is considered to be not significant or have no influence, irrespective of other effects, it is classified as “negligible”.

Cumulative Effects

2.6 Within EIA, the cumulative effects of a development in conjunction with other consented but not yet built development in the area are considered. Cumulative effects are generally considered to arise from the combination of effects from the Proposed Development and from other proposed or permitted schemes in the vicinity. Ryedale Gas Project (NY/2010/0159/ENV) as shown on **Figure 2.1** was identified that would potentially have significant cumulative effects when considered in conjunction with the Proposed Development. The Ryedale Gas Project includes five principal elements:

- Gas production from the existing Ebberston South Well Site;



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LEGEND

- Assessment Site Boundary
- Boundary of North York Moors National Park
- Cumulative Schemes
  1. Ryedale Gas Project (NY/2010/0159/ENV)

Figure 2.1

Project
Ebberston Moor EDS, North Yorkshire

Drawing Title
Cumulative Sceme

Date	Scale	Drawn by	Check by
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- The construction of two underground pipelines from the existing Ebberston South Well Site to a new Gas Processing Facility;
- A new access road between the A170 and the proposed Gas Processing Facility;
- A Gas Processing Facility at Hurrell Lane, Thornton-le-Dale; and
- An Above Ground Installation (AGI) connection into the existing National Transmission System (NTS) pipeline to the south of the Gas Processing Facility on land off New Ings Lane.

Determining the Content of the ES

2.7 'Scoping' involves focusing the study (and hence the ES) on those issues of potential significance. A scoping request specifically for this Proposed Development has not been sought as the Applicant has voluntarily undertaken an EIA. A request for an EIA scoping opinion for a related scheme called the Ebberston to Knapton Pipeline was submitted to North Yorkshire County Council (NYCC) on 6th February 2012 and the NYMNPA on 21st March 2012. The scoping requests considered that the following environmental issues should be addressed in detail in the ES:

- Ecology;
- Landscape and Views;
- Air Quality;
- Noise and Vibration;
- Transport;
- Flood Risk, Hydrology and Drainage;
- Archaeology and Cultural Heritage;
- Socio Economics; and
- Ground Conditions

2.8 NYCC adopted a Scoping Opinion on 2nd July 2012 and NYMNPA adopted a scoping opinion on 13th April 2012, both of which generally agreed with the scope set out above for the EIA relating to the Ebberston to Knapton Pipeline. As some of the elements of the Ebberston to Knapton Pipeline scheme are common to the Proposed Development (i.e. gas production from the existing Ebberston Moor 'A' Well Site), coupled with the fact that there is overlap between the Assessment Site boundaries, the Applicant decided to base the scope of this Proposed Development on the adopted scoping opinions from NYCC and NYMNPA.

Consultation Process

2.9 As part of the evolution of the Proposed Development, consultation has been undertaken with the local community and key stakeholders including: NYMNPA, North Yorkshire County Council (NYCC), Ryedale District Council (RDC), English Heritage, Environment Agency, Natural England, Yorkshire Wildlife Trust and Yorkshire Water. The Applicant also carried out a public exhibition on 7th June 2013 in the local area at Allerston Village Hall. The public exhibition provided an opportunity to inform local residents and key stakeholders, of progress with the Proposed Development and allow the local residents to feed back their comments on the proposals.

3.0 ALTERNATIVES

3.1 The EIA Regulations[5] require that an applicant provides an outline of the main alternatives considered. The Applicant considered the following alternatives to the Proposed Development:

- No Development;
- Alternative locations for the well site;
- Alternative methods for treating gas; and
- Alternative designs.

3.2 Extensive analysis has been undertaken to identify the physical and environmental constraints and opportunities of the Assessment Site and to inform the design of the Proposed Development. The layout and design of the Proposed Development have been informed by: the considerations and constraints within the Assessment Site and surrounding area; the key design principles which underpin the Proposed Development; and feedback from the public exhibition.

3.3 The preferred option for this phase of the Ebberston Moor gas field development is to pipe the produced gas to the existing adjacent Lockton Compound, where the gas would be conditioned before being transferred through the existing LTZ pipeline via the existing above ground pipeline connection operated by Northern Gas Networks (NGN). The gas would then be distributed to local customers in the Scarborough and Whitby region of North Yorkshire.

[5] The Town and Country Planning (Environmental Impact Assessment) (England) Regulations

4.0 THE PROPOSED DEVELOPMENT

4.1 The Proposed Development as shown on **Figure 4.1** comprises the following elements:

1. Gas production from the existing well (Ebberston Moor – 1) which will be side tracked for the purpose of placing a horizontal well bore at the top of the Permian Kirkham Abbey Formation (KAF) reservoir to avoid producing the water underlying the gas reservoir. The side track is proposed to be drilled under planning permission NYM/2013/0068/FL prior to construction commencing on this Proposed Development;
2. Piping the produced gas to the adjacent Lockton Compound, where the gas will be conditioned (i.e. water and hydrogen sulphide content reduced to the required level); ~~and~~
3. Flowing the conditioned gas into the neighbouring Local Transmission Zone (LTZ) pipeline through the existing above ground pipeline connection, operated by Northern Gas Networks (NGN). The gas will then be distributed to meet local demand for gas in the Scarborough and Whitby region of North Yorkshire~~.~~**; and**
4. **Injecting produced and condensed water via a disposal well into the Sherwood Sandstone.**

Description of the Proposed Development

4.2 The existing well site and Lockton Compound will be developed as shown in **Figure 4.1** to allow for gas production and conditioning to meet the gas quality specification of the neighbouring LTZ pipeline. It is anticipated that the volume of gas to be produced will be at an annual average rate of 15 million standard cubic feet per day (mmscf/d), sufficient to supply the gas needs of approximately 75,000 homes.

4.3 All storage tanks, loading and unloading areas and all gas conditioning equipment will be sited on an impermeable and curbed surface with suitable drains, catchment and hydrocarbon separation equipment. A specially designed interceptor will be provided to clean rain and surface water within the site drains before leaving the Assessment Site through the soakaway.

4.4 The structures and equipment required to condition the sour gas including: the separation and water handling unit; amine and glycol contactors; produced liquid drum; dew point control unit; and some auxiliary equipment as shown on **Figure 4.1** will be enclosed within the Gas Conditioning Building. The building has been designed to accord with the guidelines set out in Design Guide 5 (New Agricultural Buildings), published by NYMNPA in February

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Revision		Date	Drn	Ckd
A	Site Area Amended	04.06.13	SJ/RP	NC
B	Redline & Metering skid amended	14.06.13	SJ/RP	NC
C	Note 4, 18 & Flare added	18.06.13	SJ/RP	NC
D	Flare relocation and client amends	20.06.13	SJ/RP	NC
E	Redrawn to Topo Survey	27.06.13	SJ/RP	NC
F	Landscape Proposal amended	03.07.13	SJ/RP	NC
G	Drainage Proposals amended	05.07.13	SJ/RP	NC
H	Flare gravel surface removed	10.07.13	SJ/RP	NC

DALBY FOREST DRIVE

EBBERSTON COMMON LANE

EMERGENCY GATE

Access to Flare

French Drain

DUCT

Well Site Entrance

18 Car Park Spaces

Proposed new bund to flare. NOTE: 706 m³ to be displaced to form new bund.

Existing gravel surface

Existing bund reprofiled

TEL Exit

Proposed gravel surface to match existing

Proposed concrete surface

NGN Entrance

TEL Entrance

LEGEND

- SITE BOUNDARY 21,604 sqm (approx) (New development within 'green' area : 13,198 sqm [1.3 Ha])
- EXISTING FENCE
- PROPOSED FENCE
- Existing Planting to be Retained
- Proposed Canopy Tree
- Proposed Whip and Transplant Planting
- Proposed Grassland mix

Note: Drawing to be read in conjunction with Landscape Strategy Plan : 19819/L207

1. Indicative Gas Well
2. Indicative Water Disposal Well
3. Drainage Interceptor Pit
4. Drainage Soakaway
5. Site Office
6. Gas Conditioning Building (20m x 34m x 8.5 m): Separation and Water Handling Unit, Amine and Glycol Contactors, Auxillary Equipment, Produced Liquid Drum, Dew Point Control Unit, Pig Launcher.
7. Fire Water Tank: 50 Cubic Meters
8. Pipeline Pig Trap Area
9. Lean Rich Amine and Glycol Storage
10. Metering Skid (10m x 5m)
11. Indicative existing LTZ Pipe Manifold
12. Indicative existing NGN Building
13. Flare (footprint 225 sqm)
14. Loading Area
15. Water Separator Building
16. Gas Fired Heater
17. Water Storage Tank
18. Gas Generator

Figure 4.1

Project
EBBERSTON EDS

Drawing Title
PROPOSED SITE LAYOUT

Date	Scale	Drawn by	Check by
June 2013	1:500@A1	SJ/RP	NC
Project No	**Drawing No**		**Revision**
19819	P_12		H

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2013[6].

4.5 In addition there will be a new loading bay and impermeable hardstanding. The existing neighbouring LTZ Pipe Manifold operated by NGN, the existing administration building and the existing access into the Lockton Compound will also remain as they are located outside of the Assessment Site boundary.

4.6 Once conditioned the gas will be routed to the metering module where the export gas volume will be measured along with other quality parameters prior to the gas being delivered into the existing neighbouring NGN above ground pipeline connection on the Lockton Compound from where it will flow into the NGN gas distribution system to be distributed to the local gas market in the Scarborough and Whitby area.

4.7 The Proposed Development will be monitored by a System Control and Data Acquisition (SCADA) system and safety systems will be remotely operated via a telephone or satellite link to Knapton Generating Station (KGS). The operation of the Proposed Development will be carried out by the KGS management. It will be able to be remotely operated with operators available at KGS to respond to alarms and to carry out routine inspection and maintenance.

Produced Water Disposal

4.7a Any water produced during the production of gas will be disposed of via a water disposal well within the well site. Planning permission (NYM/2013/0068/FL) has already been granted for two gas appraisal wells and it is intended that one of the wells will be used for injecting the produced water into the Triassic Sherwood Sandstone rock layer beneath the well site.

Flare

4.8 A flare system will be provided as shown in **Figure 4.1** to assist start and stop operations and eliminate fugitive emissions. Flaring will occur when gas needs to be routed to the flare until it is of an acceptable quality before transfer into the NGN facilities.

Heights

4.9 **Table 2** provides the approximate heights of the tallest structures on the Assessment Site as shown on **Figure 4.1** during operation.

[6] North York Moors National Park Authority (February 2013) Design Guide 5 (New Agricultural Buildings)

Table 2: Approximate Heights of Structures/Buildings during Operation

Structure/Buildings	Height (m)
Inlet separator	1.8m
200kw gas fired heater	1.8m
Water storage tank	4.8m
Building on extended Lockton Compound	8.5m
Flare	8.5m

Access

4.10 Access to the Assessment Site will continue to be from the A170 via Ebberston Lane and Ebberston Common Lane. No unauthorised vehicles associated within the Proposed Development will use the Dalby Forest Drive. Ebberston Common Lane is an unclassified road with passing places which is also used as a Public of Right of Way (PROW). Approximately 100m north of Givendale Head Farm, the road becomes an unimproved public highway (gravel track) as shown on **Figure 4.1**. There is already an established access using this route to Ebberston Moor 'A' Well Site and the Lockton Compound.

4.11 A new access with a gated entrance will be created from Ebberston Common Lane to enable transport tankers to enter the Lockton Compound. Vehicles will exit the Lockton Compound via a separate gated new access. Two emergency exit gates will be located along the north western fence line of the Lockton Compound. The well site and Lockton Compound will be fenced.

Parking

4.12 Eighteen car parking spaces are already provided at the Ebberston Moor 'A' Well Site and these would be retained and used during the Proposed Development.

Landscaping

4.13 The landscape strategy for the Proposed Development has been designed with particular consideration to the topography, landscape and ecological constraints and opportunities identified on the Assessment Site. Landscaping works will involve some ground modelling works associated with careful felling of woodland and the creation of new bunds surrounding the flare within the Assessment Site. Elsewhere within the Assessment Site, works will include soil preparation, tree and vegetation planting and seeding. The existing screening along the frontage with the Ebberston Common Lane will be retained and enhanced where

possible, with the exception of a small number of trees and a section of hedgerow which will be lost to create the two new entry points into the Assessment Site. A distance of 5m radius from the flare will need to be cleared of vegetation to mitigate fire risk.

Sustainable Drainage Measures

4.14 Sustainable Drainage Systems (SuDS) will be used to reduce flood risk, improve water quality, assist groundwater recharge whilst also providing amenity and wildlife benefits.

4.15 The existing drainage system at Ebberston Moor 'A' Well Site and Lockton Compound will be upgraded to ensure that the Assessment Site is capable of safely containing, separating and disposing of both rainwater and any fluid spills from the tanks and piping. A closed drain system will recover and store any liquids drained from the process equipment, which will be disposed of in an approved manner. Surface water site drains will be sent to a receiving separator and then routed to a clean water discharge point.

Utilities

4.16 The Proposed Development will connect into the existing telephone network in close proximity to the Assessment Site, with new infrastructure installed beneath roads, and verges wherever possible. Electric power will be generated on site by a 1MW natural gas fuelled engine driven generator. Use of natural gas as fuel instead of diesel for power generation reduces the carbon footprint of the Proposed Development. Natural gas will also be used to fuel a 200KW heater to keep the gas from forming hydrates in the plant inlet.
Lighting

4.17 The facility will not be lit at night except in emergencies or for urgent maintenance. During the winter months, it will be necessary for part of the Assessment Site to be lit during late afternoon and early evening when deliveries and loading takes place for health and safety reasons.

Construction Programme

4.18 The current project schedule anticipates planning and field development approval in 2013, construction commencing in January 2014 and gas production start-up after July 2014. The Ebberston Moor EDS is expected to be operating for up to five years, with construction commencing once the side-track to Ebberston Moor – 1 well has been drilled under planning permission NYM/2013/0068/FL. If this Proposed Development is successful, a pipeline will be

constructed in order to deliver gas and associated liquids from the existing Ebberston Moor 'A' Well Site to the Knapton Generating Station (KGS). The pipeline will be the subject of a separate planning application and is not considered further in the ES accompanying this planning application.

4.19 A Construction Environmental Management Plan (CEMP) will be prepared for the Proposed Development that will provide the methods of managing environmental issues for all involved with the construction activities.

4.20 NYMNPA may wish to stipulate the hours of work prior to the commencement of the works. It is anticipated that these will be 07:00 to 18:00 Monday to Friday and 07:00 to 13:00 on Saturdays. All work outside these hours will be subject to prior agreement, and/or reasonable notice, by NYMNPA which may impose certain restrictions. Night time working will be restricted to exceptional circumstances.

Decommissioning and Restoration

4.21 There are two potential scenarios for the decommissioning and restoration phase of the Proposed Development which depend on whether planning permission for future use of the well site is secured prior to the end of the operational life of this Proposed Development (nominally operational for up to five years).

4.22 The first scenario occurs if planning permission for the second phase of Ebberston Moor 'A' Well Site is secured, that is, continued gas production from Ebberston Moor – 1 well and piping the gas to the KGS. During this scenario it is anticipated that the structures and equipment on the well site would be retained in situ for reuse, as part of the future use of the well site. At the same time the equipment and structures on the Lockton Compound and its extension and the flare associated with this Proposed Development would be removed from site to enable restoration of these areas of the Assessment Site to their current condition. The implications and description of any future development on the well site would be discussed in a separate planning application and is not considered further in this ES.

4.23 The second scenario occurs if planning permission for the second phase of Ebberston Moor 'A' Well Site is not secured before the end of the life of this Proposed Development. During this scenario a restoration scheme for the well site will be agreed in writing with the NYMNPA six months prior to the decommissioning and restoration commencing. The general aim of restoration would be to return the well site to forestry in a condition as close as practicable to its original state or to a combination of forestry and amenity uses.

4.24 It is anticipated that the restoration scheme would involve all the wells being plugged hydrostatically tested, and abandoned with an agreed programme or method approved by the Health and Safety Executive (HSE). The wellheads will be removed and the well casing cut off not less than 1.83m below the finished ground level, a metal plate welded on top, and a concrete slab placed on top of the plate. All plant, equipment, pipes, cables, buildings, security fencing, and surface installations, will be dismantled and removed from the Assessment Site. Concrete installations will be broken up and removed. At the same time the gas conditioning and metering equipment and connection to NGN's LTZ pipeline used for the EDS will be decommissioned and the Lockton Compound restored to its original condition.

5.0 ECOLOGY

5.1 The Assessment Site is not subject to any statutory or non-statutory nature conservation designations. The vegetation and habitats surrounding Ebberston Moor 'A' Well Site and Lockton Compound are typical of the wider environment and comprise mature commercial forestry plantation with the plant species being common and widespread and the habitats having low species diversity. The habitats are used potentially by breeding birds, bats and reptiles.

5.2 No significant residual effects on ecological receptors have been identified during the construction, operation, decommissioning and restoration phases of the Proposed Development with the effective implementation of the CEMP which will provide guidance on vegetation clearance timing and constraints and reptile mitigation.

5.3 No cumulative effects have been identified between the Ryedale Gas Project and this Proposed Development during construction, operation, decommissioning or restoration due to the distance between the two projects.

6.0 LANDSCAPE AND VIEWS

6.1 The Assessment Site is set on the edge of a clearing (Ebberston Low Moor) on the eastern periphery of Dalby Forest within the North York Moors National Park. It is enclosed on three sides (south, west and north) by mature woodland dominated by coniferous trees. The eastern boundary is defined by Ebberston Common Lane, beyond which Ebberston Low Moor with its remnant farmland, divided by small clusters of woodland surrounding Ebberston Common Farm located approximately 300m south-east of the Assessment Site and low stone walls and fencing are characteristic of the area. Visibility is effectively restricted to the

eastern periphery of the Assessment Site (Ebberston Common Lane). The nearest settlements to the Assessment Site are the rural hamlets of Langdale End and Low Dalby located 4.25 km northeast and 4.75 km southwest respectively.

6.2 The Proposed Development will expand upon the existing well site and Lockton Compound development platforms. In landscape and visual terms the Proposed Development will require the removal of localised areas of regenerating woodland surrounding the flare and the Gas Conditioning Building. The highest elements (8.5m) of the proposed built form are the Gas Conditioning Building and flare which will however be set against the existing backdrop of mature vegetation (11.5m – 15m).

6.3 The scale and nature of the Proposed Development will be effectively absorbed within the Assessment Site and the wider Dalby Forest as well as the North York Moors National Park through the enhancement of existing screen planting along the eastern boundary which will reduce the visibility of security fencing and built form. Once established, this will ensure the visual effect of development is minimised when viewed from the limited public vantage points adjacent to the Assessment Site. In addition the Proposed Development will not significantly alter the character of the well site and Lockton Compound as the future use is very similar to their current use or the wider area of Dalby Forest and the National Park due to the containment provided by the forestry.

6.4 Very few residential properties (Ebberston Common Farm and South Moor Farm) will experience views of the Proposed Development. Due to distance and screening from the proposed bund and vegetation along the eastern boundary of the Assessment Site with Ebberston Common Farm, any effect will be of low magnitude and of minor adverse significance. Views from South Moor Farm are curtailed by gently rising topography and low stone walls which effectively screen views towards the Application Site from the property. This will cause a negligible magnitude of change and a subsequent negligible significance of effect. Furthermore there will be a few views from Public Rights of Way located in close proximity to the Assessment Site which will at worse have a moderate adverse effect at Year 1.

6.5 Once decommissioned, the landscape will be restored and existing vegetation will be allowed to mature whereby the existing landscape character would be reinstated so that there will be no significant change in view and landscape buffers would provide an effective screen in views towards the Assessment Site.

6.6 Due to a combination of distance (approx. 2.4 km), intervening forestry and steep changes in topography between the Assessment Site and the well site within the Ryedale Gas Project shown on **Figure 2.1** to the south, it is considered that there will be no cumulative landscape and visual effects as a result of the Proposed Development.

7.0 AIR QUALITY

7.1 The Assessment Site is located outside of an Air Quality Management Area (AQMA) as all pollutant background concentrations comply with national air quality standards. The closest AQMA is 18 km south west at Malton.

7.2 The significance of effects for construction, decommissioning or restoration activities is considered to be negligible due to the distance of construction from receptors, along with the construction dust management that will be implemented through the CEMP. The effects associated with traffic are considered to be negligible, due to the small number of vehicles required to construct, operate and decommission and restore the Proposed Development. Operational emissions are also considered to be negligible, due to the small amounts of gas that will be combusted on-site and because of the best available technology that will be utilised on-site to manage emissions.

7.3 No cumulative effects have been identified between the Ryedale Gas Project and this Proposed Development during construction, operation, and decommissioning and restoration due to the distance between the two projects.

8.0 NOISE

8.1 There are few current sources of noise in the area surrounding the Assessment Site apart from weather, wildlife and farm animals activities, sporadic road vehicle movements, aircraft over-flights and agricultural operations.

8.2 Construction, decommissioning and restoration noise may be audible at the nearest noise-sensitive receptors in some circumstances. However, the levels of such noise will be completely acceptable with regard to the usual standards, and recommendations can be implemented to reduce noise levels to a minimum. For instance, working hours may be restricted by planning conditions or by mutual agreement in order to ensure that construction noise only occurs during the working day, and never in the evening or at night. The effects during construction, and decommissioning and restoration are anticipated to be none.

8.3 The noise arising from the operation of the Proposed Development will have no significant effect on the residential amenity at local dwellings (i.e. a negligible effect). Noise limits will

be set so that the ambient noise levels outside all existing dwellings are not increased by normal operations on site. Items of noise-emitting plant will be specified and purchased prior to construction so that the Proposed Development operates within these limits.

8.4 No cumulative effects have been identified between the Ryedale Gas Project and this Proposed Development during construction, operation, decommissioning or restoration due to the distance between the two projects.

9.0 TRANSPORT

9.1 The Assessment Site is located north of the A170 with access off the A170 onto Ebberston Lane at a junction within the village of Ebberston. Ebberston Lane then connects with Ebberston Common Lane at Givendale Head which provides direct access to the Assessment Site. The A170 is considered to remain suitable as an access and the established access to the Assessment Site from the A170 using Ebberston Lane and Ebberston Common Lane is also considered appropriate for accessing the Assessment Site.

9.2 The greatest effect of the Proposed Development is anticipated to be during the construction and decommissioning and restoration phases, relating to pedestrians, equestrians and cyclists, where the residual effect is considered to be of minor adverse significance. However, these phases will occur over a short term and temporary period.

9.3 The effect of the operational development once construction is complete is considered to be negligible as the Proposed Development will generate very few trips (a maximum of five HGV movements a day) and these can be easily accommodated within the existing road network.

9.4 There will be no cumulative effects in terms of transport during construction, operation, and decommissioning and restoration of the development schemes.

10.0 FLOOD RISK, HYDROLOGY AND DRAINAGE

10.1 The Assessment Site is situated on permeable sandstones near the crest of a plateau and is effectively free of the risk of flooding. The permeability of the bedrock combined with the impermeability of the underlying Oxford Clay Formations creates a shallow aquifer[7] from which groundwater issues as springs to the west and south. The permeability of the ground means that there are no surface watercourses in the vicinity of the Assessment Site and any rainfall soaks into the ground rather than flows away.

[7] An aquifer is the strata that contains groundwater

10.2 The Proposed Development will not significantly affect flood risk, hydrology and drainage during construction, operation or decommissioning and restoration provided good working practices are implemented and the drainage design effectively incorporated into the impermeable development platform across the Assessment Site.

10.3 The elevated position of the Assessment Site ensures that there are no issues of flooding, either at the Assessment Site or the surrounding area as a baseline condition and this will remain unchanged as a result of the Proposed Development

10.4 The effects of the Assessment Site on the hydrology of the area are potentially of major/moderate adverse significance and could be long term, even during the construction phase. However, mitigation measures through the implementation of the CEMP and the drainage strategy, and general good working practices will reduce the magnitude and significance of these effects to short term and negligible.

10.5 No significant drainage effects have been identified during the different phases of the Proposed Development and restoration of the Assessment Site in both scenarios will have a permanent effect of minor beneficial /negligible significance.

10.6 There will be no cumulative effects as the Proposed Development is physically separated from the Ryedale Gas Project by a steep-sided valley forming the head of Troutdale which creates a hydrological barrier between the sites.

11.0 ARCHAEOLOGY AND CULTURAL HERITAGE

11.1 There are no statutory or non-statutory cultural heritage designations within the Assessment Site. There are numerous prehistoric sites and finds located within the vicinity of the Assessment Site such as extant earthworks which are in some cases designated as Scheduled Monuments. There are also a number of remains of quarries and their associated lime kilns of post-medieval date in the area. In addition the nearby parishes, villages and hamlets of Allerston and Ebberston were established in the Saxon Period.

11.2 During construction and operational phases, the Proposed Development may have very minor adverse effects on the setting and visual integrity of nearby Scheduled Monuments including barrows a short distance to the southeast and north, and an area of linear boundaries and barrows further to the east.

11.3 The construction phase of the Proposed Development will also have a negligible-minor adverse effect on the remains of the post-medieval quarries and lime kilns in the area if found within the area of the extended development platform. This will be mitigated, along with effects on other unknown archaeology, by a programme of archaeological monitoring and recording being carried out in the areas outside of the existing development platform during the initial construction work (stripping of topsoil from areas outside of the existing compounds) to record any areas of known or potential archaeological remains.

11.4 The cumulative effects of the Proposed Development, in conjunction with the Ryedale Gas Project, will be negligible or minor beneficial. This is because archaeological recording will accompany the developments (in those areas not already impacted by ground reduction) and will provide information on the presence or absence of cultural heritage resources at the sites of both development schemes.

12.0 ECONOMICS

12.1 The Proposed Development is anticipated to generate short-term, temporary employment for up to approximately 30 workers during construction and up to approximately 10 workers during decommissioning and restoration and medium-term employment for three workers (already employed by the Applicant), in trades likely to have a readily available, local labour force. In addition, indirect economic vitality will be introduced to the North York Moors National Park and North Yorkshire through local procurement of supplies and services.

12.2 Once operational the Proposed Development will help deliver secure supplies of energy through the production of gas. The gas supply infrastructure will add to the reliability of national energy supply from which every user of the system benefits creating medium term moderate beneficial effects.

12.3 There will be minor beneficial cumulative effects on direct and indirect employment as a result of the Ryedale Gas Project and the Proposed Development. In addition there will be a major beneficial effect on the national energy supply resulting from increased gas production during operation of both development schemes.

13.0 GROUND CONDITIONS AND CONTAMINATION

13.1 The Assessment Site overlies calcareous sandstone, mudstone and shelly limestone. The bedrock is overlain by a thin veneer of superficial soil profile consisting of weathered rock and topsoil occurring typically to thicknesses of between 0.3m and 1.5m in the vicinity of the

Assessment Site. The gas to be extracted through the Proposed Development is located deep below ground in the Permian Kirkham Abbey Formation (KAF) reservoir.

13.2 No significant soil and geology impacts are expected to occur throughout the construction, operational and decommissioning and restoration phases, provided that standard mitigation measures are implemented. These measures include: installation of drip trays beneath oil tanks/engines/gearboxes/hydraulics where appropriate; handling of oil, fuel and other chemicals including process waste in securely bunded areas; and the production of an emergency spillage action plan.

13.3 There will also be negligible cumulative effects resulting from the Ryedale Gas Project and Proposed Development due to the distance between the two schemes.

13A.0 PRODUCED WATER DISPOSAL

13A.1 The water to be produced during the production of gas is from the gas reservoir within the Permian Kirkham Abby Formation (KAF). The produced water is highly saline with salt concentrations greater than would be found in seawater. The produced water will be reinjected into Sherwood Sandstone which is located below the KAF. The produced water will be two times more saline that the Sherwood Sandstone formation water. In addition both waters show significant naturally occurring hydrocarbons related to the presence of natural gas. The water found the KAF and Sherwood Sandstone beneath the well site is not used for drinking water or any other uses and is separated from drinking water and other usable water supplies vertically and horizontally by impermeable rock.

13A.2 During construction there is potential for contamination of water supplies relating to the inadequate construction of the borehole. Measures will be put in place through use of best available technology and best practice to minimise potential for contamination of water supplies. After implementation of the mitigation measures, the residual effect during construction would be negligible.

13A.3 During operation, the injection of produced water into the water already present in the Sherwood Sandstone will result in the localised displacement of the existing water. This displacement will occur more than 40 km from useful groundwater and therefore will not affect groundwater used for drinking water or other uses. Therefore there will be negligible effect as a result of injecting produced water into the Sherwood Sandstone.

13A.4 There will be negligible effects during decommissioning and restoration once gas production has ceased with appropriate sealing of the injection well and removal of potential contaminants from the Assessment Site.

13A.5 There will also be negligible cumulative effects resulting from the Ryedale Gas Project and Proposed Development due to the distance between the two schemes and only the Proposed Development is proposing to inject produced water into the Sherwood Sandstone.

14.0 RESIDUAL EFFECTS AND CONCLUSIONS

14.1 In summary, the Proposed Development comprises the exploitation of conventional hydrocarbon resources only, for an operational period of up to five years, including: gas production from one wellhead at the existing Ebberston Moor 'A' Well Site; piping the produced gas to the adjoining Lockton Compound where the gas would be conditioned; injecting the conditioned gas via an existing Above Ground Installation (AGI) connection to a Northern Gas Network (NGN) pipeline that runs between Pickering and Whitby; and creation of two new access points off Ebberston Common Lane.

14.2 The Proposed Development will result in the following beneficial effects:

- Supplying a significant area of North Yorkshire with locally produced natural gas;
- The creation of up to 30 construction, and 10 demolition and restoration jobs, for people with skills that are readily available in the local labour market;
- Introduction of indirect economic vitality to the local area through local procurement of supplies and services during construction;
- Securing the present employment of the Applicant's employees who will be in charge of operating the facility;
- Providing additional and new business to local businesses engaged in transport, engineering, maintenance and supply; and
- Improvement of the UK's ability to manage fluctuations (daily, weekly and seasonally) which occur in gas supply and demand and thus enabling indirect reductions in costs for householders and commercial and industrial companies,

14.3 The ES has also identified a number of adverse effects which will mainly occur during construction and demolition and restoration phases which include the following:

- Loss of breeding bird habitat;

- Changes to a limited number of views associated with construction activities from residential properties, roads and public rights of way;
- Local changes to landscape features, character and the National Park as a result of construction activities;
- Temporary disruption to users of the surrounding road network;
- Potential for mobilisation of contaminants resulting in the deterioration of surface and ground water quality;
- Potential for dust emissions resulting from the clearance of on-site structures and groundworks; and
- Potential for noise and vibration disturbance to the nearby residents.

14.4 However, the implementation of the mitigation measures outlined within the CEMP during construction such as the use of site hoarding, dust and noise suppression measures and temporary drainage will result in many adverse effects being minimised or avoided.

14.5 There will also be adverse residual effects during operation of the Proposed Development resulting from the following:

- Changes to a limited number of views from residential properties, roads and public rights of way;
- Local changes to the National Park;
- Increased traffic along Ebberston Lane and Ebberston Common Lane associated with operational staff access and existing the Proposed Development and the transportation of by products and treatment fluids;
- Visual and landscape effects on Ebberston Low Moor Round Barrow Scheduled Monument and its setting;
- Increased traffic movement affecting the setting of Ebberston Low Moor Round Barrow Scheduled Monument.

14.6 Once decommissioning and restoration has been completed after up to five years of operational activities in scenario 1 (future planning permission is secured for the well site) many of the effects on the environment will generally be neutral or slightly beneficial. There will be more beneficial effects in scenario 2 (no future planning permission is secured for the well site) as the whole Assessment Site will be decommissioned and restored to its original state of forestry.