6.0 ECOLOGY AND NATURE CONSERVATION

Introduction

6.1 This chapter of the ES assesses the likely significant effects of the Development in terms of ecology and incorporates a summary of the impact assessment which is supported by the following appendices:

- Appendix 6.1 – Biodiversity Action Plans
- Appendix 6.2 – Explanation of Ratcliffe Criteria
- Appendix 6.3 – Desk Study Data
- Appendix 6.4 – Target Notes
- Appendix 6.5 – Pond Habitat Suitability Index Assessment
- Appendix 6.6 – Badger Survey and Assessment
- Appendix 6.7 – Bat Roost Potential Survey Methodology & Grading Criteria of Features
- Appendix 6.8 – Hedgerow Survey
- Appendix 6.9 – Habitats Regulations Assessment Screening (River Derwent SAC)

6.2 The chapter describes the assessment methodology; the baseline conditions at the Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

Legislative and Policy Context

Introduction

6.3 The Ecological Impact Assessment (EcIA) has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments which are summarised below.

6.4 It is important to appreciate that the level of protection given to a particular species or habitat through international or national legislation does not necessarily relate to the evaluated level of importance of that receptor to nature conservation. For example species may be widespread or common nationally, but of scarce occurrence in a particular county (for example, it might be at the limit of its geographical range), or conversely a species may also be considered to be rare internationally or nationally but be abundant within particular areas.

6.5 Legislation may have been enacted primarily for animal welfare purposes, or may be open to considered interpretation. For example, all places used for shelter by bats are protected by a range of international and national legislation. However, a transient roost used infrequently by an individual of a common species of bat is not of the same value to nature conservation as a hibernation site upon which a whole colony of bats may depend.

6.6 Consequently, whilst the protection given to specific receptors associated with the Site might be highlighted within this chapter for its relevance to how the Development might be constructed, operated decommissioned or restored, this should not be confused with the relative level of importance to nature conservation that is separately evaluated and reported.

UK Wildlife Legislation

6.7 The Wildlife and Countryside Act, 1981 (as amended)[i] consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)[ii] and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive)[iii] in Great Britain. It is complemented by the Wildlife and Countryside (Service of Notices) Act 1985[iv], which relates to notices served under the 1981 Act, and the Conservation of Habitats and Species Regulations 2010 (as amended)[v], which implement Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive)[vi].

6.8 The Natural Environment and Rural Communities (NERC) Act 2006[vii] places an obligation on Local Planning Authorities for the material consideration of species of principal conservation importance, which are listed in Section 41 of the Act.

Planning Policy Context

6.9 The EcIA has been undertaken within the context of relevant planning policies and guidance documents. A summary of those policies relevant to ecology and nature conservation is presented below. Legislation relevant to ecology and Biodiversity Action Plans (BAPs) are summarised and presented as Appendix 6.1 to this chapter.

National Planning Policy Framework

6.10 The Government published the National Planning Policy Framework (NPPF)[viii] in March 2012 which replaced Planning Policy Statement 9 (PPS9)[ix] in providing guidance to Local Planning

Authorities when developing their planning policies and when considering planning applications affecting protected habitats, sites and species.

6.11 In respect of the natural environment, Section 11 Paragraph 109 of the NPPF states that:

> *"…the planning system should contribute to and enhance the natural and local environment by:*
> - *Protecting and enhancing valued landscapes, geological conservation interested and soils;*
> - *Recognising the wider benefits of ecosystem services; and*
> - *Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures..."*

Planning Practice Guidance (March 2014)[x]

6.12 Planning Practice Guidance was published by the Department for Communities and Local Government (DCLG) in 2014. Paragraphs 007 to 023 relate to 'biodiversity, ecosystems and green infrastructure' and primarily aim to direct planning authorities to the relevant paragraphs in the NPPF (see above) to assist them with discharging their statutory obligations in respect of nature conservation.

6.13 The NPPF consolidates Section 40 of the Natural Environment and Rural Communities Act 2006·, which "*places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. A key purpose of this duty is to embed consideration of biodiversity as an integral part of policy and decision making throughout the public sector, which should be seeking to make a significant contribution to the achievement of the commitments made by Government in its Biodiversity 2020 strategy*".

Local Planning Policy

North Yorkshire County Council Minerals Local Plan Saved Policies (1997)[xi]

6.14 The North Yorkshire County Council Minerals Local Plan is currently in the process of being replaced by the Minerals Core Strategy[xii]. This document will set out a new approach to minerals development in the North Yorkshire Minerals and Waste Development Framework (MWDF) plan area, and will set out saved policies from the Local Plan.

6.15 There is one saved policy in the Minerals Local Plan, which was adopted in 1997, relating to ecology and nature conservation:

- Policy 4/6a - Nature conservation and habitat protection (local).

North York Moors National Park Authority Adopted Core Strategy and Development Policies (2008)[xiii]

6.16 The North York Moors National Park Authority has published planning advice in respect of developments potentially affecting biodiversity receptors. The National Park Management Plan[xiv] sets out strategic policies on the conservation of the natural environment to achieve the statutory purpose to conserve the wildlife, landscape and cultural heritage of the Park. These policies provide the framework for more specific actions in the local Biodiversity Action Plan, and inform the inclusion of policies in the Local Development Framework (LDF).

6.17 Adopted core strategy policies in respect of nature conservation that have been saved following a review of policies against the NPPF are summarised below.

- Core Policy A – Delivering National Park Purposes and Sustainable Development. Broad policy that includes a statement on the maintenance and enhancement of the natural environment and conditions for biodiversity and geodiversity; and
- Core Policy C – Natural Environment, Biodiversity and Geodiversity. Policy specifically referring to the need for consideration of impacts of development on protected sites, species and habitats, and to maximise opportunities for the enhancement of biodiversity.

Ryedale Local Plan, March 2002[xv]

6.18 The Ryedale Local Plan was adopted in 2002 and most of the policies have now been superseded by the Local Plan Strategy. No Local Plan policies relevant to nature conservation have been saved.

The Ryedale Local Plan Strategy, Adopted September 2013[xvi]

6.19 The Ryedale Local Plan Strategy was adopted in September 2013 and superseded the 2002 Ryedale Local Plan. The new Local Plan details the proposed delivery of housing, employment and retail development in the county for the next 15 years. The Local Plan will also ensure the protection of key Ryedale assets such as environmental and historic assets.

There is one policy relevant to nature conservation (Policy SP14 – Biodiversity) which is summarised below:

- Policy SP14 – this policy sets out the strategy by which biodiversity in Ryedale will be conserved, restored and enhanced. Measures listed in the policy include minimising the fragmentation of habitats, maximising opportunities for habitat enhancement, improving ecological networks and Green Infrastructure routes, requiring net biodiversity gain as part of new development schemes and resisting development proposals that would result in significant loss or harm to biodiversity in Ryedale. The policy also sets out the locations for targeted investment in Ryedale, as well as stating that "*loss or harm to other nature conservation features would be avoided or mitigated. Compensation will be sought for the loss or damage to other nature conservation features which would result from the development proposed*".

Assessment Methodology and Significance Criteria

Sources of Information & Data

Ecological Assessment Guidance Documents

6.20 Throughout the EcIA, the approach adopted is based upon recognised techniques of ecological survey and impact assessment and published guidance documents for EcIA (Institute of Environmental Assessment (IEA), 1995[xvii] and Treweek, 1999[xviii]).

6.21 The EcIA of the Development also broadly follows guidelines published by the Institute of Ecology and Environmental Management (IEEM) in June 2010[xix]. The guidelines have been endorsed, amongst others, by English Nature (now Natural England), the Environment Agency, the Institute of Environmental Management and Assessment (IEMA), and the Wildlife Trusts.

6.22 Whilst the methods used for assessing the significance of likely effects resulting from potential impacts on features of nature conservation importance build on those set out in the IEEM guidelines for EcIA, the assessment also takes account of the professional opinion of URS ecologists, and hence draws from experience of similar EcIA carried out over the past 25 years.

Desk-based Study

6.23 A desk study was undertaken to identify any statutory and non-statutory protected sites within a 2 km radius, in addition to protected or otherwise notable species within 1 km of the Site. This is referred to as the 'desk study area'. A summary of the organisations and websites that were contacted/ searched, and the data obtained is provided in Table 6.1.

Table 6.1: Summary of information obtained in desk-study

Organisation/ website	Information Obtained
Multi-Agency Geographic Information for the Countryside (MAGIC) website	Statutory designated sites of nature conservation importance Ancient woodland
Joint Nature Conservation Committee (JNCC) website	Citation sheets for international statutory designated sites
Natural England website	Citation sheets for national statutory designated sites
North and East Yorkshire Ecological Data Centre (NEYEDC)	Non-statutory designated sites of nature conservation importance Records of protected/ notable species
North Yorkshire Badger Group	Returned no records
North Yorkshire Bat Group	Bat records
The Forestry Commission	Bird and bat records
Scarborough Bird Club	Bird records

Study Area

6.24 The study area comprises Ebberston Moor South (EMS) Well Site and the 13.9 km pipeline route from the EMS Well Site to KGS, with the Phase 1 Habitat survey extended where possible to cover land within 250m either side of the centreline. In addition, a field to the north of Warren House Farm , a section of field and farm yard at Grange Farm and a field adjacent to the KGS are included within the study area, as these areas are anticipated to be used for the storage of pipes and other construction materials during the construction phase.

6.25 The study area has been determined based on both the likely extent of any impacts (considering both the nature and source of the impact and any pathways by which those impacts could affect ecological receptors), and the nature and mobility of the potential receptors themselves. The study area is not a rigid limit, and different receptors are acknowledged to have the potential to be affected at different distances from any particular impact. Consequently, a discretionary approach has been adopted for receptors outside the general study area and desk study area as appropriate. For example, the nearest European designated sites (North York Moors Special Area of Conservation (SAC) and Special Protection Area (SPA)) have been scoped into the assessment on the basis that the Development has the potential to affect the habitats or qualifying features.

Field Survey Methodologies

6.26 The scope of the surveys undertaken to inform this assessment and the respective methodologies adopted are summarised in the paragraphs below.

6.27 A summary of the surveys undertaken to inform the ecological impact assessment of the Development is provided in Table 6.2.

Table 6.2: Summary of Field Surveys Undertaken: June 2013-July 2014

Survey	Method	Area	Date
Phase 1 Habitat Survey	Standard habitat mapping in accordance with JNCC guidance (Joint Nature Conservation Council (JNCC), 2010)	Site and up to 250 m either side of route corridor, where access permitted.	29.06.13 - 30.07.13 16.09.13 – 19.09.13 23.05.14 09.07.14
Badger Survey	Search for setts, latrines and other field signs.	Site and up to 30 m either side of route corridor, where access permitted.	29.06.13 – 30.07.13 16.09.13 – 19.09.13 23.05.14 09.07.14
Bat Roost Potential Survey	Visual search for potential roost sites in trees from ground level. (Mitchell Jones & McLeish, 1999) (Bat Conservation Trust, 2007)	Any trees within the Site to be directly lost.	29.06.13 – 30.07.13 16.09.13 – 19.09.13 23.05.14 09.07.14
	Visual search for potential roost sites in trees using tree climbers with a Natural England bat licence.	Tree Group 1	04.02.14
Water vole survey	Search in areas of suitable aquatic habitat for signs of water vole (Strachan and Moorhouse, 2006)	Site and up to 250 m either side of route corridor, where access permitted.	29.06.13 – 30.07.13 16.09.13 – 19.09.13
Otter survey	Search in areas of suitable aquatic habitat for signs of otter	Site and up to 100 m either side of route corridor, where access permitted.	29.06.13 – 30.07.13 16.09.13 – 19.09.13
Bird habitat Appraisal	Assessment of potential habitat value for wintering and breeding bird populations	Site and up to 50 m either side of route corridor, where access permitted.	29.06.13 – 30.07.13 16.09.13 – 19.09.13 23.05.14 09.07.14
Reptile Habitat Appraisal	Appraisal of habitats to support reptile species (Gent and Gibson, 2003)	Site and up to 50 m either side of route corridor, where access permitted.	29.06.13 – 30.07.13 16.09.13 – 19.09.13 23.05.14 09.07.14
Amphibian Habitat Appraisal	Assessment of aquatic and terrestrial habitat suitability for amphibians (English Nature, 2001)	Site and up to 250 m either side of route corridor, where access permitted.	29.06.13 – 30.07.13 16.09.13 – 19.09.13 23.05.14 09.07.14
Invertebrate Habitat Appraisal	Assessment of potential habitat value for invertebrates IEA, 1995)	Site and up to 50 m either side of route corridor, where access permitted.	29.06.13 – 30.07.13 16.09.13 – 19.09.13 23.05.14 09.07.14

Phase 1 Habitat Survey

6.28 A Phase 1 Habitat survey of the Site was undertaken in accordance with the standard JNCC methodology (JNCC, 2010)[xx] between the 29th May 2013 and 9th July 2014. The scope of the Phase 1 Habitat survey included land within the pipeline route working corridor and up to approximately 250m either side of this working corridor where access was permitted. The presence of notable or invasive plant species was recorded where seasonal survey constraints allowed.

6.29 All habitats within the study area were appraised for their suitability to support protected and/ or notable species or flora and fauna including statutorily protected species, national and NERC Section 41 Habitats and Species of Principal Importance[xxi].

6.30 The scope of the Phase 1 Habitat survey included:

- evaluation of habitat suitability for otter and water vole in accordance with published methodology (Strachan et al., 2011)[xxii];
- evaluation of habitat suitability for notable species or assemblages of breeding and wintering birds;
- evaluation of habitat suitability for notable species or assemblages of amphibians and reptiles (Herpetofauna Workers Manual, 2012)[xxiii]; and
- evaluation of habitat suitability for notable species or assemblages of invertebrates.

6.31 In addition, the following species-specific surveys were undertaken.

Badger Survey

6.32 Signs of badger were recorded where observed including badger setts, paths, latrines, foraging signs and any other field signs of badger in accordance with published guidance (Harris, Cresswell and Jeffries, 1989[xxiv]). The survey focussed on land within the Site boundary and within 50m of the Site.

Bat Roost Potential Survey

Visual Inspection

6.33 An external inspection and evaluation of any trees and other features within the Site for suitability for roosting bats and classification of potential (negligible, low, moderate or high)

in accordance with published guidance (Bat Conservation Trust, 2012)[xxv], a summary of which is presented in Appendix 6.7. Buildings associated with Grange Farm within the footprint of the Site were excluded from the Bat Roost Potential survey because they will not be impacted (the farm yard at Grange Farm will be used for temporary construction materials storage only). There are no other buildings within the footprint of the Site.

Tree Climbing Survey

6.34 Following the initial bat roost potential appraisal, one tree group (Tree Group 1) was identified as being potentially suitable for roosting bats. A tree climbing survey was therefore undertaken on 4th February 2014 by two Natural England licensed bat ecologists trained in tree climbing and aerial rescue, to determine whether there was evidence of usage of the tree group by bats.

6.35 Initially, all trees within Tree Group 1 were inspected at ground-level from all angles using binoculars and a high-powered torch. Features that could have potential for roosting bats were identified (e.g. woodpecker holes, rot cavities, splits, cracks, flaking bark and thick-stemmed ivy). Where possible, features were ruled out from ground-level; however, when this was not possible, they were accessed using ropes and ladders and inspected.

6.36 Four mature trees within Tree Group 1 were identified as sufficiently large to contain features that could support bat roosts. Features on these trees were examined in detail using a torch, endoscope and mirror to inspect (where possible) the full extent of the feature and search for bats or evidence of bat activity (e.g. droppings, urine stains, odour, feeding remains, scratch marks or fur-oil staining).

6.37 Once inspected, trees were categorised in accordance with published guidance (Bat Conservation Trust, 2012)[xxvi], which is summarised in Appendix 6.7.

Impact Assessment and Significance Criteria

6.38 The following paragraphs describe the EcIA methodology adopted, including evaluation of the nature conservation of receptors, the impacts (either direct or indirect) and the likely significant environmental effects.

6.39 The approach to EcIA is as follows:

- habitats and species that might be affected by the Development are considered and baseline conditions (both those likely to be present at the time works begin, and for the sake of comparison, those predicted to be present at a set time in the future) are defined through a combination of desk-based study and field survey work;
- the importance of each habitat and species (that is both present and could be affected by the Development) is evaluated to place their relative biodiversity/ nature conservation value, social/ community value and economic value into context in terms of their international, national, regional or local value. The ecology of the habitats and species present is also considered;
- the changes or perturbations predicted to result as a consequence of the Development (i.e. impacts), and which could potentially affect habitats or species, are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are described and are taken into account;
- the likely effects (beneficial or adverse) of these impacts on species and their habitats are then assessed, and where possible quantified in terms of their extent, magnitude, duration, reversibility, timing and frequency;
- the likely effects are determined to be either significant or not significant (see Table 6.6);
- measures to avoid or reduce any significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on features of nature conservation importance are also included;
- scope for enhancement is considered where applicable; and
- any residual effects of the Development are reported.

Evaluation of Receptor's Importance to Nature Conservation

6.40 The relative importance or value of potential receptors to nature conservation has been evaluated in accordance with the IEEM guidelines (2010).

Biodiversity Value

6.41 In order to determine the relative biodiversity value of an ecological feature, certain characteristics have been used. These characteristics are outlined in Table 6.3 below.

Table 6.3: Characteristics used to assess biodiversity value

Characteristics used to identify ecological resources or features likely to be important in terms of biodiversity*

Characteristics used to identify ecological resources or features likely to be important in terms of biodiversity*
Animals or plant species, subspecies or varieties that are rare or uncommon, internationally, nationally or more locally.
Ecosystems and their component parts that provide the habitats required by the above species, population and/ or assemblages.
Endemic species or locally distinct sub-populations of a species.
Habitat diversity, connectivity and/ or synergistic associations.
Notably large populations of animals or concentrations of animals considered uncommon or threatened in a wider context.
Plant communities (and their associated animals) that are considered to be typical of valued natural/ semi-natural vegetation types.
Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.
Species-rich assemblages of plants or animals.
Typical faunal assemblages that are characteristic of homogenous habitats.

*(Adopted from IEEM, 2006)

6.42 The Ratcliffe Criteria (Ratcliffe, 1977)[xxvii] have also been considered. These criteria have contributed to the IEEM characteristics in Table 6.3. They have been developed in the UK and in most instances have been quantified for the selection of statutory sites of national importance for nature conservation, designated as Sites of Special Scientific Interest (SSSI). A similar approach is often taken to identify the most important non-statutory sites at a county or district level. A summary of the Ratcliffe Criteria is reproduced as Appendix 6.2, with the key topics listed below:

- size (area or extent);
- rarity;
- diversity;
- fragility;
- potential value;
- position within an ecological/ geographical unit;
- 'typicalness';
- recorded history;
- 'naturalness'; and
- intrinsic appeal.

6.43 These criteria include measures by which both relative value can be attributed, and indications of how likely it is that the ecological receptor will be affected by a change connected the presence of the Development. The assignment of a relative value (i.e. categorising within a defined geographical context) is necessary before the significance of predicted effects can be assessed. The assignment of value to a specific resource requires that the assessor make use of relevant published evaluation criteria (where available). Where published evaluation criteria do not exist (for example, guidance for assigning value below the county value is rarely available) it has been necessary to apply best judgement, supported by a carefully reasoned argument. The categories of species value that have been adopted for this assessment are provided in Table 6.4.

Table 6.4: IEEM scales of ecology and nature conservation value

IEEM scale of value	Criteria	Example
International	High importance and rarity, international scale and limited potential for substitution.	• Internationally designated sites (e.g. SPAs and SACs). • Sustainable area of a habitat listed in Annex I of the Habitats Directive, or smaller areas of such habitat where they are essential to maintain the viability of a larger whole. • Sustainable population of a species listed in Annex IV of the Habitats Directive and Annex I of the Birds Directive.
UK/ National	High importance and rarity, national scale, or regional scale with limited potential for substitution.	• Nationally designated sites (e.g. SSSIs). • Regionally important sites with limited substitution possibilities. • Sustainable area of a priority habitat identified in the UK BAP. • Sustainable population of a species listed on Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981, or a priority species identified in the NERC Act, of a UK Red Data book species, or of a nationally rare species (15 or fewer 10 km squares in the UK).
Regional/ County	High or medium importance and rarity, local or regional scale and limited potential for substitution.	• Regionally important sites with potential for substitution. • Locally designated sites (e.g. SINCs). • Sustainable area of a priority habitat identified in local BAP, or as a nationally scarce species (16 – 100 10 km squares in the UK).
District/ Local	Low or medium importance and rarity, local scale.	• Undesignated sites that are good examples of a more widespread habitat, or species-poor examples of a habitat of note (as described above) or of earth heritage interest. • Population of a species that is of low importance/ rarity but of some value locally.
Negligible	Not applicable	• Sites, habitats and species not meeting any of the above criteria.

6.44 Seven geographic frames of reference are used to assess the value of nature conservation features (Table 6.5). For example, all national designations (e.g. SSSI) are considered to be

of value to nature conservation at the UK level (although not all component parts may be valued equally).

Table 6.5: Geographic frames of reference for determining the relative nature conservation value

Relative Value of Nature Conservation Resource	Geographic Area
International	European Community and wider (up to global) area
UK	England, Scotland, Wales, Northern Ireland
National	England
Regional	Yorkshire and Humber
District/ County	North Yorkshire
Local	Site and/ or neighbouring sites
Within the zone of influence	Site and/ or neighbouring sites

6.45 Where the value of the nature conservation resource is considered, and then subsequently not evaluated to be of importance at even a local level, this is clearly stated. Such features may or may not be considered further, depending on their extent and relationship with other features.

6.46 Whilst there are national criteria for appraising rarity and threats to populations for different groups of species, it should be appreciated that species may be widespread or common nationally, but of scarce occurrence in a county or district context. Conversely a species may be common in a county or district context, but considered to be rare internationally or nationally. Consequently when undertaking an evaluation of a site, consideration is also given to relevant local biodiversity guidance documents such as local Biodiversity Action Plans (BAPs) and the species and habitat action plans that might be derived from these.

6.47 Whilst the level of legislative protection afforded to a particular ecological receptor is noted as part of the evaluation process, this may not have a direct bearing on the evaluation of a feature in terms of its nature conservation importance.

6.48 In addition to the existing value a receptor represents in terms of nature conservation, the potential value of species and habitats has also been taken into consideration where it is feasible to restore a feature to a favourable nature conservation status.

6.49 Secondary or supporting features of value are also considered in this study. These are features that might not have any significant relative nature conservation value in themselves,

but provide some ecological function such as acting as a buffer against negative impacts, or enabling the effective conservation of a more valuable feature.

Prediction of Impacts and Significance of Effects

6.50 The identification of the potential impacts anticipated to be associated with the Development has been based on a variety of approaches. The primary source of information has been the review of similar projects and professional experience of the assessment team.

6.51 The likely effects of potential impacts on ecological receptors largely depend upon the sensitivity of that ecological feature and the magnitude of the impact. The parameters that may influence the assessment of this are listed and defined in Table 6.6.

Table 6.6: Environmental parameters that influence the severity of a potential impact or significance of the resulting effect

Environmental Parameter	Description
Magnitude	The 'size' or 'amount' of an impact is referred to as the magnitude of the impact, and is determined on a quantitative basis where possible (see also Table 6.8).
Extent	The extent of an impact is the area over which the impact occurs. The magnitude and extent of an impact may be synonymous.
Duration	The duration of an impact is the time over which an impact is expected to last. The duration of an effect is the length of time that a receptor will be affected prior to recovery or replacement. This can be considered in terms of life cycles of species and regeneration times of habitats. The duration of an effect may be longer than the duration of the impact (or *vice versa*). For example, construction activity may cause disturbance over two years but the effect of that disturbance may continue for five years, or conversely, receptors may adapt or habituate to an impact and cease to be affected by it before that impact stops.
Reversibility	Reversible (or temporary) impacts are those that do not have a persistent or permanent nature. Reversible or temporary effects are those from which a spontaneous recovery is possible, or for which effective mitigation is possible that will allow such a recovery. Irreversible (or permanent) impacts are those that endure within the context of a specific timescale, for example extending throughout the duration of the scheme's operational phase and potentially beyond. Irreversible (or permanent) effects include those from which recovery is not possible within a reasonable timescale, or for which there is no reasonable chance of action being taken to reverse it. The effects of permanent land-take may lead to irreversible fragmentation and decline of habitats. Some indirect effects may also be irreversible or of an unspecified duration.
Timing and Frequency	Some activities or changes may only cause an adverse effect if they coincide with critical life stages or seasons, therefore timing of the activity or change is important in assessing the impact. Such effects may be avoided through careful timing of works. The frequency of an activity (impact) may also influence the resulting effect.

6.52 Effects on ecology and features of nature conservation importance can be adverse or beneficial. Impacts may be direct or indirect.

6.53 The significance of the effect resulting from impacts on ecological receptors associated with the Development will depend upon all of these factors, and can relate to the integrity of ecologically functioning sites or systems. The definition of 'site integrity' (as developed for use in the Habitats Regulations Assessment) used is: "*the coherence of its ecological structure and function, across its whole area, that enables it to sustain that habitat, complex of habitats and/ or the levels of populations of the species for which it was classified*" (Office of Deputy Prime Minister (ODPM) and Department for Environment Food and Rural Affairs (DEFRA), 2005).

6.54 A site that achieves this level of coherence is considered to be at a favourable condition (IEEM, 2006).

6.55 For the purposes of assessing impacts on internationally designated nature conservation sites, the likely effect of developments on ecological and site integrity also needs to be considered within the terms of the Conservation of Habitats and Species Regulations 2010 (commonly known as the Habitats Regulations). However, the Habitats Regulations do not consider the 'significance' of effects. Conversely this ES is required to predict likely significant environment effects, and the terms 'significant' and 'not significant' are used in this context as shown in Table 6.7. The effects of an impact on a receptor are initially described in the absence of mitigation, but taking into account the implementation of the measures necessary to ensure legislative compliance during the construction and operation phases.

6.56 The terms 'significant' and 'not significant' are not used without also referring to the value of the affected receptor, or the threshold at which an effect is considered to be significant.

Table 6.7: Descriptions of the terms 'significant' and 'not significant'

Scale of impact upon ecological integrity	Description
Significant	The effect is significant if the ecological integrity of a feature is influenced in some way. It may be that the impact is large in scale or amount, irreversible, has a long-term effect, or coincides with critical life stages. In addition, a combination of any of these parameters may also be assessed as significant. An impact is considered to be significant in this ES where it results in a major or moderate effect.

Scale of impact upon ecological integrity	Description
Not significant	The effect is not significant if it does not influence the ecological integrity of a feature. It may be that the impact is small in scale or amount, reversible within a reasonable timescale and/ or does not coincide with critical life stages. An impact is not considered to be significant in this ES where it results in a minor or negligible effect.

6.57 It is important to attribute a level of confidence by which the predicted effect has been assessed, particularly in the case where only a qualitative assessment can be made. The criteria for these definitions are set out in Table 6.8. Unless otherwise stated, confidence levels are certain/ near certain.

Table 6.8: Confidence levels

Confidence Level	Description
Certain/ near-certain	Probability estimated at 95% chance or higher.
Probable	Probability estimated to be at or above 50% but below 95%.
Unlikely	Probability estimated to be at or above 5% but less than 50%.
Extremely unlikely	Probability estimated at less than 5%.

6.58 The magnitude of an impact is described as Major, Moderate, Minor or Negligible. Impacts are neither beneficial nor adverse in nature. Such terms are relative to the receptor affected by the impact (i.e. a particular impact can result in a beneficial effect on one receptor and an adverse effect on another), and the criteria associated with them are summarised in Table 6.9.

Table 6.9: Criteria used to define the magnitude of an impact

Relative level of predicted impact	Criteria
Major	Large scale loss of resource and/ or quality and integrity of resource; severe damage to key characteristics, features or elements. Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/ damage to key characteristics, features or elements. Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.

Relative level of predicted impact	Criteria
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements. Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

6.59 The relative significance of an effect is largely a product of the magnitude and duration of the impact and the value and sensitivity of the ecological receptor, but assessment is moderated by professional judgement and takes into account the considerations described above. The receptor value and impact magnitude can be combined to produce a matrix that illustrates to what degree an effect is likely to be relatively significant. This is provided as Table 6.10 below.

6.60 Although the methodology broadly follows IEEM guidelines, a matrix of significance of effects has been used to ensure consistency with other chapters.

Table 6.10: Matrix for evaluation of relative significance of effects

Magnitude of impact	Ecological value					
	Inter-national	National	County	District	Local	Negligible
Major	Major	Major	Moderate	Moderate	Moderate or Minor	Negligible
Moderate	Major	Major or Moderate	Moderate	Moderate	Moderate or Minor	Negligible
Minor	Major or Moderate	Moderate or Minor	Minor	Negligible	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Limitations and Assumptions

Assumptions

6.61 Unless otherwise specified, all distances within this report relate to the shortest distance between two described points. For example the distance between the Site and a designated area is presented as the linear ('as-the-crow-flies') distance between the two closest points on their boundaries. SI (Système Internationale) units are generally used, with the exception of measures where other units are the accepted standard in common use.

6.62 All botanical nomenclature in this document follows that described in Stace's New Flora of the British Isles (Stace, 2010)[xxviii]. In general, for all species, Latin species names are provided at the first reference of that species within the chapter, together with its vernacular name. Thereafter, the species is referred to using only its common name.

Limitations

6.63 Information obtained during the course of a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular protected species does not automatically mean that such species do not occur in the desk study area. Likewise, the presence of records for protected species does not automatically mean that these species still occur within the area of interest or are relevant in the context of the Development under consideration. However, a desk study does help characterise the baseline conditions, provides context, and can provide valuable background information that would not be gathered on a site visit alone.

6.64 No ecological survey limitations were identified. The Phase 1 Habitat surveys were undertaken in May and July and are therefore within the optimal season for identification of most flowering plant species.

Baseline Conditions

Statutory Designated Sites

6.65 Relevant designated sites are summarised in Table 6.11 below. The sites are mapped on Figure 6.1.

6.66 The Site lies partly within the North York Moors National Park, limited to the KGS and the northern c. 2 km of the pipeline route. This designation is largely associated with the landscape and recreational value of the area and is therefore not considered further in this chapter. Further details on the assessment of effects on the North York Moors National Park are provided in Chapters 7 (Landscape and Visual) and 14 (Economics).

6.67 There are four statutory ecologically designated sites within the desk study area. These are the North York Moors SAC, SPA and SSSI, the boundaries of which are largely overlapping; Nabgate SSSI, Eller's Wood & Sand Dale SAC and SSSI and Troutsdale and Rosekirk Dale Fens SSSI. In addition, potential impacts on the River Derwent SAC have been scoped into

the assessment, since the site lies approximately 5 km downstream of the proposed river crossing point.

6.68 Potential impacts on the North York Moors SPA/ SSSI are considered in this assessment where appropriate. This is on the basis that bird species that are qualifying species for the SPA/ SSSI may be present in habitats some distance from the designated site boundary.

Table 6.11: Statutory Designated Nature Conservation Sites within Potential Zone of Influence of Assessment Site

Site Name	Grid Reference	Distance from Development	Reason for Designation
Internationally Designated			
North York Moors SAC	NZ 711 021	c. 8.5 km north	The site contains the largest continuous tract of upland heather moorland in England and is designated for its Annex I habitats: • Northern Atlantic wet heaths with *Erica tetralix* • European dry heaths • Blanket bog
North York Moors SPA	NZ 711 021	c. 8.5 km north	Qualifies under Article 4.1 for supporting breeding populations of merlin (*Falco columbarius*) and golden plover (*Pluvialis apricaria*).
River Derwent SAC	SE 704 474	c. 6 km south-west	The site is designed for the presence of river lamprey (*Lampetria fluviatilis*) sea lamprey (*Petromyzon marinus*), bullhead (*Cottus gobio*) and otter (*Lutra lutra*).
Eller's Wood and Sand Dale SAC	SE 856 848	c. 1.6 km west	Designated for the presence of a population of the Annex II species Geyer's whorl snail (*Vertigo geyeri*). The Annex I habitat type 'Petrifying springs with tufa formation' is listed as a qualifying feature but not a primary reason for site selection.
Nationally Designated			
North York Moors SSSI	SE 4996 – SE 7192 – NZ 9500 – NZ 6910	c. 8.5 km north	Designated for its extensive tracts of heather moorland and breeding birds particularly the Annex I species merlin and golden plover. Also supports nationally important populations of moorland breeding birds including peregrine, hen harrier, short-eared owl, red grouse, curlew, snipe, redshank, whinchat, wheatear, ring ouzel and lapwing.
Troutsdale and Rosekirk Dale Fens SSSI	SE 900 876 and SE 903 879	c. 0.4 km north	Nationally rare spring and flush fen habitats covering an area of approximately 13.07 ha.
Nabgate SSSI	SE 866 847	c. 0.8 km west	Steep north-facing slope on Corallian Limestone supporting species-rich calcareous grassland. Also designated for dry dwarf shrub heath habitats and associated flora.
Eller's Wood and Sand Dale SSSI	SE 856 848	c. 1.6 km west	Small area of springs and associated species-rich fen and flush habitat with remnant broad-leaved woodland along valley floor on the edges of the forestry plantation.

Non-statutory Designated Sites

6.69 There are five non-statutory designated Sites of Importance for Nature Conservation (SINC) within 2 km of the Development which are summarised in Table 6.12 below. The sites are mapped on Figure 6.1.

Table 6.12: Non-statutory Designated Nature Conservation Sites within 2 km of Pipeline Route

Site Name	Grid Reference	Distance from Pipeline Route
Cockmoor Hall SINC	SE 914 867	c. 1.2 km east
West Knapton Road Verge SINC	SE 873 753	c. 1.9 km south-west
Sandy Lane Fields SINC	SE 749 497	c. 2 km south
Scampston Fish Ponds SINC	SE 866 751	c. 2 km south-west
Wilton Heights Quarry SINC	SE 861 844	c. 0.9 km west

NERC Act Section 41 Habitats and Species of Principal Importance

6.70 Several species of principal importance as listed on Schedule 41 of the NERC Act were identified as present, or potentially present, within the desk study area as part of the desk study (see Table 6.13). Where species have been identified within the zone of influence, this is discussed in the text below.

North York Moors National Park Biodiversity Action Plan (BAP)

6.71 No habitats affected by the Development meet the criteria for threatened habitats for which a Habitat Action Plan (HAP) has been produced in the North York Moors National Park BAP. Local BAP species identified during the desk study within the study area are listed in Table 6.13. Where species have been identified within the zone of influence, this is discussed in the text below.

Ryedale BAP

6.72 No habitats affected by the Development meet the criteria for threatened habitats for which a Habitat Action Plan (HAP) has been produced in the Ryedale BAP. Local BAP species identified during the desk study within the desk study area are listed in Table 6.13. Where species have been identified within the zone of influence, this is discussed in the text below.

Desk Study Records

6.73 Records of protected species within a 2 km radius of the Site have been obtained from various organisations and websites. Following a critical screening of the data provided, the following relevant records are identified (Table 6.13). Full details of the desk study data received are presented in Appendix 6.3.

Table 6.13: Summary of Protected Species Records Obtained

Species	Location(s)	Distance from Site	Protection
Adder (*Vipera berus*)	Dalby Forest (various locations)	Nearest is 0.75 km west	Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41
Common lizard (*Zootoca vivipara*)	Dalby Forest (various locations)	Nearest is 0.75 km west	Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41
Slow worm (*Anguis fragilis*)	Ellerburn Nature Reserve (SE 852 851) Sand Dale (SE 882 878)	Nearest is c. 0.5 km west	Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41
Brandt's bat (*Myotis brandtii*)	Allerston Moor (SE 883 880) -	c. 0.8 km west	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41 North York Moors National Park BAP
Brown long-eared bat (*Plecotus auritus*)	Broad Head (SE 896 886) North York Moors (SE 896 881) Allerston Moor (SE 883 880)	Nearest is c. 0.5 km east	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41 North York Moors National Park BAP
Common pipistrelle (*Pipistrellus pipstrellus*)	Broad Head (SE 896 886) Allerston Moor (SE 883 880)	Nearest is c. 0.5 km east	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41 North York Moors National Park BAP
Natterer's bat (*Myotis nattereri*)	Broad Head (SE 896 886)	c. 0.5 km east	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981 (as amended) NERC Action Section 41 North York Moors National Park BAP
Noctule bat (*Nyctalus noctula*)	Broad Head (SE 896 886)	c. 0.5 km east	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981 (as amended) NERC Action Section 41 North York Moors National Park BAP
Pipistrelle species *(Pipistrellu*s sp.)	Broad Head (SE 896 886) Allerston Moor (SE 883	Nearest is c. 0.5 km east	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981

Species	Location(s)	Distance from Site	Protection
	880)		(as amended) NERC Action Section 41 North York Moors National Park BAP
Water vole (*Arvicola amphibius*)	Upper Derwent, Yedingham (SE 894 794)	Nearest is c. 0.2 km east	Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41 North York Moors National Park BAP Ryedale BAP
Otter (*Lutra lutra*)	River Derwent (SE 893 796) Cripple Beck (SE 887 796)	Nearest is c. 0.2 km east	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981 (as amended) NERC Action Section 41 Ryedale BAP
White-clawed crayfish (*Austropotamobius pallipes*)	Yedingham (SE 894 794)	c. 0.2 km east	Conservation of Habitats and Species Regulations 2010 Wildlife and Countryside Act 1981 (as amended) NERC Action Section 41 North York Moors National Park BAP Ryedale BAP
Nightjar (*Caprimulgus europeaus*)	Numerous records from within the North York Moors National Park.	Nearest (breeding not confirmed) is at Jingleby Thorn c. 1.2 km north	Wildlife and Countryside Act 1981 (as amended) NERC Act Section 41
Goshawk (*Accipiter gentilis*)	Dalby Forest	No known breeding sites within 2 km	Wildlife and Countryside Act 1981 (as amended)
Hedgehog (*Erinaceus europaeus*)	Several records from Snainton, Scampston, Ebberston and West Knapton		NERC Act Section 41
Brown hare (*Lepus europaeus*)	Snainton (SE 911 862) Ryedale (SE 850 792)		NERC Act Section 41 Ryedale BAP

Field Survey Results

Route Summary Description

6.74 The pipeline route runs in a broadly north-south direction between the EMS Well Site, located on the southern edge of Dalby Forest (SE 895 825) and the Knapton Generating Station (KGS) at Knapton, North Yorkshire (SE 887 770). The EMS Well Site is currently not in operation, and comprises a fenced area of bare hardstanding, with boundaries supporting rank bracken and tall ruderal herbs.

6.75 After exiting the EMS Well Site, the pipeline route heads due west and crosses arable farmland south of Givendale Head Farm, bisecting Ebberston Common Lane and Oxmoor Dike. The pipeline route then heads in a south-westerly direction where it crosses forestry plantation within the North York Moors National Park predominantly following the course of existing forestry access tracks (and hence already cleared tracks) within the plantation. The pipeline route then heads in a southerly direction from the forestry plantation, crossing arable farmland to the north and east of Warren House, before crossing A170 between the villages of Wilton and Allerston. South of the A170, the pipeline route crosses predominantly flat arable farmland west of the villages of Yedingham and Allerston and crosses the River Derwent approximately 2 km west of Yedingham (SE 868 791). The pipeline route terminates at the existing (operational) KGS.

6.76 South of the A170, the land is predominantly flat agricultural fields under winter wheat crops in the floodplain of the River Derwent. The fields are typically large and are drained by numerous drainage ditches, with occasional mature hedgerows retained as field boundaries. A small section of permanent pasture (grazed by cattle at the time of the survey) is crossed in the vicinity of Wath House Farm.

6.77 The habitat types mapped within the study area are described in further detail in the paragraphs below. Target Notes (TN) are presented in Appendix 6.4.

Habitats

Arable

6.78 The majority of the habitat directly crossed by the Development comprises arable farmland, particularly the fields in the River Derwent floodplain on the south side of the A170. Most of the arable fields were either ploughed or under a winter wheat crop at the time of the surveys.

6.79 Some of the fields in the southern part of the Site appear to be under stewardship agreements and subsequently have broad uncultivated headlands to their margins. However, the majority of the fields crossed are intensively farmed with no obvious headlands retained. These uncultivated headlands, whilst supporting a more diverse assemblage of botanical species, are not considered likely to support any notable or rare plant species and none were recorded during the surveys.

6.80 The broad uncultivated arable field margins in the southern part of the Site (between Malton Road and KGS) are likely to be examples of the habitats for which the 'Arable Field Margins' Ryedale Habitat Action Plan was developed, and will provide refuges and wildlife corridors for a range of invertebrates, birds and mammals. The North York Moors National Park BAP has also prepared a Habitat Action Plan for 'Farmland' habitats.

Plantation Woodland

6.81 The northern most part of the Site is located in mature commercial forestry plantation, part of which lies within the North York Moors National Park boundary, and is managed by the Forestry Commission. The plantations in this northern section are dominated by fast growing coniferous species such as Sitka spruce (*Picea sitchensis*), Scot's pine (*Pinus sylvestris*), Norway spruce (*Picea abies*) and European larch (*Larix decidua*). The commercial plantations are divided into distinct blocks, separated by either access tracks or clear felled areas.

6.82 Several areas of broad-leaved woodland are present within the forestry plantation, with species recorded including silver birch (*Betula pendula*), sycamore (*Acer pseudoplantanus*), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*), goat willow (*Salix caprea*), rowan (*Sorbus acuparia*) and pedunculate oak (*Quercus robur*).

6.83 The pipeline route crosses a section of the mature broad-leaved woodland plantation surrounding KGS. This plantation woodland comprises a mix of alder (*Alnus glutinosa*), hazel (*Corylus avellana*), ash, hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*) and blackthorn (*Prunus spinosa*). This woodland comprises a narrow band of screening woodland approximately 10m in width that surrounds KGS.

6.84 The pipeline route also crosses a narrow band of mature broad-leaved plantation woodland between Wath House Farm and the River Derwent. The plantation is approximately 8m wide, and is dominated by pedunculate oak (*Quercus robur*) with sycamore and hornbeam (*Carpinus betulus*). The ground flora is inhibited as a result of the dense canopy, and subsequently comprises a mix of grasses, tall ruderals and occasional bramble (*Rubus fruticosus* agg.) scrub.

Semi-natural Broad-leaved Woodland

6.85 There is very little semi-natural broad-leaved woodland within the Study Area. Oxmoor Dike, which is partially bisected by the pipeline route (via an existing gap in the trees), comprises a dense band of mature woodland and scrub associated with a bank and dike. The woodland

band is approximately 20 m in width and supports hawthorn, blackthorn, hazel, rowan and elder. Dense carpets of native bluebell (*Hyacinthoides non-scripta*) are present throughout the woodland in areas.

6.86 Semi-natural woodland is also associated to the steeply wooded ravine associated with Given Dale, on the eastern side of the access road to Warren House Farm. The steep-sided hedgebanks that form the verges of this track are relatively diverse in their botanical assemblage, with several ancient woodland indicator plants. Species recorded included crosswort (*Cruciata laevipes*), forget-me-not (*Myosotis arvensis*), wild strawberry (*Fragraria vesca*) and lesser celandine (*Ranunuculus ficaria*). This habitat lies well outside the Site and will not be directly affected by the Development.

Poor Semi-improved Grassland

6.87 This habitat type is rare within the study area, and was limited to the permanent pasture behind the flood levees on both sides of the River Derwent. In patches, the grassland was dominated by soft rush (*Juncus effusus*) and was more characteristic of marshy grassland, although the distribution of this habitat type was patchy hence the classification of the habitat as poor semi-improved grassland.

6.88 This habitat type was dominated by grass species including perennial rye-grass (*Lolium perenne*) with abundant meadow foxtail (*Alopecurus pratensis*), Yorkshire-fog (*Holcus lanatum*), creeping bent (*Agrostis stolonifera*), rough meadow-grass (*Poa trivialis*) and sweet vernal grass (*Anthoxanthum odoratum*). Forb species recorded included meadow buttercup (*Ranunculus acris*), red clover (*Trifolium pratense*), common sorrel (*Rumex acetosa*) and occasional cuckoo-flower (*Cardamine pratensis*) in damper sections.

Improved Grassland

6.89 This habitat type is relatively rare within the Study Area, since the landscape is dominated by arable fields. Small improved pastures are present in the vicinity of Warren House Farm, with areas kept mown short for tent and caravan pitches. There are also some small fenced pastures grazed by sheep and a pony.

6.90 Cattle grazed improved pastures are crossed by the pipeline route north of the A170, north of Marishes Lane (at Newstead Grange) and at Wath House Farm between the River Derwent and Malton Road.

6.91 The pastures are species-poor, being dominated by perennial rye-grass with occasional scattered tall ruderals such as common nettle (*Urtica dioica*), rosebay willowherb (*Chamerion angustifolium*) and broad-leaved dock (*Rumex obtusifolius*).

Dry Dwarf Shrub Heath (Basic)

6.92 Within the forestry plantation in the Dalby Forest surrounding the northern part of the pipeline route, there are numerous tracks and rides that form part of the extensive network of cycle ways and bridle paths through the woodland. There are also several linear tracts of felled woodland that form the un-vegetated wayleaves of previously constructed gas pipeline routes through the forestry. The verges of these tracks and rides are vegetated by botanical species characteristic of the Phase 1 habitat 'dry dwarf shrub heath (basic)' being dominated by low growing heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), bilberry (*Vaccinium myrtillus*) and gorse (*Ulex europaeus*) shrubs. Additional botanical species recorded in this habitat type included purple moor-grass (Molinia caerulea), silverweed (*Potentialla anserilla*), lady's mantle (*Alchemilla vulgaris* agg.), crosswort, common dog violet (*Viola riviniana*), cowslip (*Primula veris*), common knapweed (*Centaurea nigra*), ribwort plantain (*Plantago lanceolata*), colt's-foot (*Tussilago farfara*), creeping cinquefoil (*Potentilla reptans*), black medick (*Medicago lupulina*), tormentil (*Potentilla erecta*), selfheal (*Prunella vulgaris*) and yarrow (*Achillea millefolium*). Occasional colonies of common spotted orchid (*Dactylorhiza fuchsii*) were found to be present in this habitat type. Damper sections were dominated by glaucous sedge (*Carex flacca*) and abundant meadowsweet (*Filipendula ulmaria*). More shady sections of verge supported species such as cow parsley (*Anthriscus sylvestris*), hogweed (*Heracleum sphodylium*), foxglove (*Digitalis purpurea*) and hedge woundwort (*Stachys sylvatica*).

6.93 A small area of this habitat type is also present on the westerly slope to the west of Oxmoor Dike, which is partially bisected by the Site. This area is more species-poor than the heath sections along the forestry paths, being dominated by sheep's fescue (*Festuca ovina*) with abundant sphagnum mosses, field wood-rush and occasional tormentil, heath bedstraw, bugle and marsh thistle.

Hedgerows

6.94 There are very few hedgerows in the northern third of the Site (north of the A170), with those recorded being generally species poor and poorly structured.

6.95 The hedgerows in the southern part of the Site (south of the A170) are typically species-poor although they are managed such that they retain their structure as functional hedgerows and form boundaries between large arable fields. The hedgerows are often associated with ditches, particularly in the arable farmland to the south of the River Derwent.

6.96 Each hedgerow within the study area that is either crossed by the Site or lies in close proximity to the Site is described in further detail in Appendix 6.8. Hedgerows highlighted in bold text are crossed by the Site (23 in total).

6.97 None of the hedgerows crossed by the Development is considered to meet the criteria for an 'important' hedgerow as classified in the Hedgerow Regulations 1997 in terms of their ecological value[xxix] (see Appendix 6.8).

Ditches

6.98 There are numerous ditches in the southern part of the Site (south of the A170), which drain the arable farmland in the floodplain of the River Derwent. A total of 12 ditches are crossed by the Site. The ditches have been appraised for their potential to support water vole and/ or otter as discussed below.

6.99 The ditches are typically well managed through frequent clearing of vegetation, and subsequently typically support few aquatic or marginal species. This is with the exception of a very small number of well vegetated watercourses such as ditches D10 and D11. The ditches in the Site are nearly always associated with mature field boundary hedgerows, and are assumed to be mostly man-made as a result of the drainage of land within the River Derwent floodplain for agricultural use.

Ponds

6.100 Four waterbodies have been identified in the study area, which was extended to include all habitats within 500m of the Site since this is the generally accepted terrestrial range of great crested newts from their breeding ponds. These waterbodies have been appraised for their potential to support great crested newts below.

Pond 1 (SE 892 875)

6.101 This pond is at Givendale Head Farm approximately 125m east of the Pipeline Site. This is a large man-made lagoon previously used for agricultural purposes, although it had become

colonised by tall ruderal species and was considered to be no longer extant at the time of the survey. Pond 1 is not considered further in this assessment.

Pond 2 (SE 881 861)

6.102 Pond 2 lies within the pipeline working corridor within an area of cleared forestry plantation adjacent to an existing track. The pond is open and unshaded, and at the time of the survey in late May 2013 held little water having dried out to a dense moss carpet. Aquatic species were limited to water starwort (*Callitriche* sp.), floating sweet-grass (*Glyceria fluitans*) and scattered soft rush. The pond has been recorded as drying out entirely during previous surveys in 2009 for the Ryedale Gas Project (Planning Reference Number: NY/ 2009/ 0319/ SCR).

Pond 3 (SE 871 821)

6.103 This is a large ornamental pond at Cliff Edge Farm approximately 100m east of the pipeline route. The pond is surrounded by plantation woodland and was not visible from the adjacent land.

Pond 4 (SE 870 790)

6.104 Pond 4 lies within the floodplain of the River Derwent behind the flood levees on the south side of the river, approximately 100m east of the pipeline route. The pond is a large seasonal pool that at the time of the survey in late May 2013 had almost entirely dried out. The lack of aquatic and marginal plants indicated that the pond does not hold water year-round, and the regular annual drying of the pond was confirmed by the landowner (*pers. comm.*). The pond extent at the time of the survey was approximately 10m radius, although the hollow in which it lies extends beyond the margins of the remaining open water, indicating that it varies in extent in response to rainfall. Patches of soft rush are present occasionally at the margins, although the pond edge is not clearly defined.

Rivers

6.105 The pipeline route crosses the River Derwent approximately 2 km west of Yedingham. At the crossing point, the river is c. 5m in width with a fast flow and shallow banks c. 0.5 m in height. The river is open and unshaded at the crossing point, with a 2 m grassed raised flood defence embankment on both sides of the river, behind which lies marshy grazed pasture.

6.106 Marginal species present at the river crossing point are limited to scattered stands of reed canary-grass (*Phalaris arundinacaea*).

Evaluation

6.107 The habitats within the study area are typical of forestry plantation throughout the county. The forestry plantation has the potential to support breeding birds, including Schedule 1 breeding birds (see below). Given that the forestry is commercially managed for timber, the habitat itself is not assessed to be anything other than local value. The North York Moors National Park BAP has a habitat action plan for 'Woodland', although this is in relation to ancient and semi-natural woodland, and is therefore not applicable to any of the woodland within the Site.

6.108 The dry dwarf shrub heath habitats within the woodland rides associated with the forestry plantation were found to be the most species-rich habitats within the Site, although they do not merit an evaluation above local level given that they are not designated for their nature conservation value at the county level. The pockets of heath habitat within the Site are not representative of the true 'Heath' habitat type for which a habitat action plan has been prepared in the Ryedale BAP, and the habitat type is ubiquitous throughout the North York Moors National Park.

6.109 None of the hedgerows within the Site are considered to meet the criteria for 'important' hedgerows under the Hedgerow Regulations 1997, and subsequently none of the hedgerows are considered to represent examples of 'Ancient/ Species-rich Hedgerows' Ryedale BAP habitat type.

6.110 None of the ponds are considered to represent an example of the 'Wildlife-rich Ponds' habitat type for which a Habitat Action Plan has been prepared in the Ryedale BAP.

6.111 The broad uncultivated headlands in the southern part of the study area (between Malton Road and the KGS), and the arable fields themselves are habitats listed on the Ryedale and North York Moors National Park BAPs respectively. These habitats are therefore acknowledged to be of local value, although are not assigned a county value given that they are not specially designated for their nature conservation value, and are widespread and common throughout the county.

6.112 An action plan has been prepared for 'Rivers and Streams' in the North York Moors National Park BAP, although the section of River Derwent crossed by the Development does not lie

within the remit of the BAP. Notwithstanding the international designation of downstream sections of the River Derwent as a SAC, the riparian habitat alone is evaluated to be of local nature conservation only. However, when considered in the context of the protected species that it is known to support; namely white-clawed crayfish, otter and water vole, it is considered that the River Derwent is of national importance to nature conservation.

6.113 When considered in the cumulative context, the habitat assemblages within the study area are wholly representative of those found throughout the county. With the exception of the uncultivated arable headlands, none of the habitats identified are representative of rare or threatened habitats in the county for which action plans have been developed through the Ryedale and North York Moors BAPs. It is therefore evaluated that the habitats within the study area are of local value only to nature conservation.

Breeding Birds

Woodland and Ground Nesting Species

6.114 Woodland habitat, scrub and hedgerows present within the study area provide suitable nesting habitat for a range of common woodland bird species. In particular, the woodland habitat associated with the forestry plantation in the northern part of the pipeline route and surrounding the well site is likely to be used by a range of species including those recorded incidentally during the Phase 1 Habitat survey such as blue tit (*Cyanistes caerulus*), great tit (*Parus major*), coal tit (*Periparus ater*), robin (*Erithacus rubecula*), blackbird (*Turdus merula*), song thrush (*Turdus philomelos*), wood pigeon (*Columba palumbus*), goldcrest (*Regulus regulus*), jay (*Garrulus glandarius*), magpie (*Pica pica*) and wren (*Troglodytes troglodytes*). The mature plantation woodland belts at the KGS and north of Wath House Farm (close to the River Derwent) also provide good suitable nesting habitat for breeding birds.

6.115 The large arable fields crossed by the pipeline route provide potentially suitable habitat for ground nesting farmland birds such as skylark (*Alauda arvensis*), yellow wagtail (*Motacilla flava*), red-legged partridge (*Alectoris rufa*), pheasant (*Phasianus colchicus*) and lapwing (*Vanellus vanellus*), all of which were recorded incidentally in this habitat during the Phase 1 Habitat survey. However, the suitability of any particular field will be largely dependent upon the arable regime adopted in any given season.

6.116 There is potentially suitable foraging habitat for barn owl (*Tyto alba*) along the uncultivated arable field headlands and along ditches in the southern part of the pipeline route.

6.117 A pair of tawny owls (*Strix aluco*) was incidentally observed by the arboricultural survey team in the eastern specimen of damaged crack willow adjacent to Friar Dike in TG2 in July 2013, and may be nesting in a cavity in this tree (or nearby).

Goshawk

6.118 Forestry plantation within the North York Moors National Park is known to support the Schedule 1 nesting species, goshawk. The goshawk nest sites are monitored annually by volunteers on behalf of the Forestry Commission, which has confirmed that there are no recorded goshawk nest sites within the potential zone of influence of the Development, (considered to be within c. 400 m based on Forestry Commission guidance (Petty, 1996)[xxx]).

Nightjar

6.119 This species has been recorded as nesting within clear felled areas of forestry throughout the North York Moors National Park. Although varying nationally, trends in Yorkshire indicate that this species is undergoing an expansion in numbers due to the increase in clear felled and young restocked plantations (Scott et al., 1998)[xxxi] in the county. It is estimated that there are up to 4,024 pairs nesting in North Yorkshire (Conway & Henderson, 2005)[xxxii].

6.120 There are no confirmed nesting records of nightjar within the study area, although Scarborough Bird Club has recorded nightjar in June and July 2011 in the clear felled forestry plantation at Jingleby Thorn approximately 1.2 km north of the Site, and it is assumed that this indicates breeding. It is likely that this species' distribution varies in response to forestry felling operations and the area of clear felled woodland at Jingleby Thorn does provide optimum nesting habitat for nightjar, which nests in clear felled areas of the forestry plantation which remain suitable until re-growth is around 15 years old (Birdguides 2006)[xxxiii].

6.121 There are several areas of clear felled plantation and young re-growth areas within the forestry plantation to the north of the Site, with the nearest potentially suitable habitat for nightjar to the Site boundary approximately 200 m to the west, north of Warren House Farm.

Evaluation

6.122 Habitats within the study area provide suitable habitat for a range of breeding bird species, associated with scrub and mature forestry plantation. There is evidence to suggest that the Schedule 1 species nightjar is nesting in the clear felled forestry plantation at Jingleby Thorn, although there is no habitat suitable for nesting nightjar within the Site boundary.

6.123 The Ryedale BAP has a species action plan for 'Farmland Birds', which includes several species recorded incidentally during the surveys (lapwing, yellowhammer and skylark), and the conservation headlands associated with arable fields on the south side of Malton Road are likely to provide suitable habitat for these species within the agricultural landscape.

6.124 However, none of the species recorded are particularly rare or threatened in a local, county or national context, and the North York Moors National Park is known to be a county stronghold for nesting nightjar. It is therefore evaluated that the breeding bird assemblage in habitats affected by the Development is of local nature conservation value.

Amphibians

6.125 The desk study has indicated that there is one record of great crested newt in the study area at Box Cottage, Snainton (SE 920 824) approximately 4 km east of the Development (i.e. outside the 2 km search radius).

6.126 A total of four ponds have been identified within a 500m radius of the pipeline route. Of these, three ponds are extant (Ponds 2, 3 and 4) and those that were accessible during the surveys (Ponds 2 and 4) have been subject to a Habitat Suitability Index (HSI) assessment to determine their likely suitability for great crested newts. The results of the HSI assessment are presented in Appendix 6.5.

6.127 Pond 2 is a seasonal pond within an area of clear felled forestry plantation. The pond scores a HSI of 0.47 ('Poor') and is considered unsuitable for great crested newts on the basis that it is a seasonal ephemeral pond that does not hold water sufficiently late into the summer months to support breeding great crested newts (whose larvae are dependent upon aquatic habitats until their metamorphosis and emergence in late summer). The pond is also isolated from any other ponds in the wider local area.

6.128 Pond 4 is also a seasonal rain-fed pond in the floodplain of the River Derwent. The pond scores a HSI of 0.38 ('Poor') and is likewise considered unsuitable for great crested newts on the basis that it does not hold water sufficiently late into the summer months. Furthermore, the pond is likely to be subject to regular annual flood events from the adjacent River Derwent.

6.129 Access into the land containing Pond 3 was not possible and therefore this pond has not been subject to a detailed appraisal for great crested newts. However on aerial photography

the pond appears to be a small private man-made fishing lake, and is completely isolated from any other ponds within 500m in which a great crested newt population may be present. Although the presence of fish does not preclude the presence of great crested newts, when considered in the context of the isolation of the waterbody from others in the area (great crested newts are heavily dependent on a network of interconnected ponds) the presence of great crested newts in Pond 4 is considered unlikely.

6.130 On the basis of habitat unsuitability, it is concluded that there is no reasonable likelihood of great crested newt being present within the Site and therefore no further consideration is given to this species.

Badger

6.131 Baseline information pertaining to badger is presented in confidential Appendix 6.6.

Bats

6.132 A large number of bat species have been identified through the desk study as present in the study area, and an abundance of records were received from both NEYEDC and North Yorkshire Bat Group. Species recorded in the study area included common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Brandt's bat (*Myotis brandtii*), Natterer's bat (*Myotis nattereri*), brown long-eared bat (*Plecotus auritus*) and noctule bat (*Nyctalus noctula*). In addition, the Forestry Commission has erected several artificial bat boxes throughout the forestry plantation, with the nearest ones to the Site located approximately 1 km to the north. The boxes are regularly monitored and have been found to support roosting common pipistrelle, soprano pipistrelle, brown long-eared bat and Natterer's bat.

6.133 Mature trees within the pipeline working corridor have been appraised for their potential to support roosting bats. The results of this appraisal are summarised in Table 6.13 below and the trees subject to the bat roost potential appraisal are mapped on Figure 6.3. Trees that have the potential to be directly affected by the Development are highlighted in bold text. The methodology for bat roost potential assessment is reproduced in Appendix 6.7.

6.134 The plantation woodland surrounding KGS is considered to be insufficiently mature to have any features that may provide roosting opportunities for bats and has been discounted from a detailed appraisal.

6.135 Coniferous trees in the mature forestry plantation within the Site are considered unsuitable for roosting bats as they do not have any features that may provide roosting habitat for bats such as cracked and flaking bark, damaged limbs and boss holes in the stem. The density of planting also largely precludes the presence of bat roosts since the access to any potential tree is 'cluttered'.

Table 6.13: Summary of Bat Roost Potential Appraisal of Mature Trees

Tree Reference	Description	Bat Roost Potential
T1	Mature ash in hedgerow fragment at Warren House Farm. Main stem has split in main stem on southern aspect providing a cavity that may be used by roosting bats.	Moderate
T2	Mature ash. No visible holes or cavities in limbs or main stem.	Low
T3	Mature ash. No visible holes or cavities in limbs or main stem.	Low
T4	Dead tree. No visible holes or cavities in main stem, tree is very isolated and exposed at the top of a hill.	Negligible
TG1	**Several mature and semi-mature ash, beech and sycamore in disused quarry. Some have cracks in main stem but not all trees in the group were inspected in detail.**	**Low**
T5	**Mature ash in roadside hedgerow with dense ivy-cladding. Main stem appears relatively cluttered impeding bat flight into any cavities behind the ivy, although ivy offers some potential.**	**Low**
T6	Large mature ash in field boundary hedgerow. No visible holes or cavities in limbs or main stem.	Negligible
T7	Large mature ash in field boundary hedgerow. Storm damage to crown and hollow in main stem providing potential roosting cavities.	Moderate
T8	Mature crab apple grown out of hedgerow. No visible holes or cavities in limbs or main stem.	Negligible
T9	Large mature ash in field boundary hedgerow. No visible holes or cavities in limbs or main stem.	Negligible
T10	Mature twin stemmed field maple with several cracks in limbs that may provide cavities for roosting bats.	Moderate
T11	Large mature ash in field boundary hedgerow. No visible holes or cavities in limbs or main stem.	Negligible
T12	**Large mature ash in field boundary along ditch. No visible holes or cavities in limbs or main stem.**	**Negligible**
T13	Mature crack-willow on southern bank of Friar Dike. Tree has storm damage to crown and light ivy cladding.	Low

Tree Reference	Description	Bat Roost Potential
TG2	**Two mature crack willow on southern bank of Friar Dike with storm damage and dense ivy cladding.**	**Low**
T14	Semi-mature pollarded ash (multiple stems) with no visible holes or cavities in limbs or stems.	Negligible
TG3	Line of mature white willow. Several have cracked limbs and flaking bark and are in generally poor structural condition. Stems cluttered but potential for cavities in limbs and stems.	Low
TG4	**Linear woodland plantation belt dominated by pedunculate oak with sycamore and elm. None of the specimens appeared to have any features that may support bats such as cavities in the limbs and trunk or ivy cladding.**	**Low**
T15	**Mature multi-stemmed pedunculate oak in field boundary. Tree has damaged branch on western aspect but does not appear to lead into a cavity.**	**Low**
T16	Mature pedunculate oak in field boundary. Some storm damage and cavities in the crown although main stem is cluttered.	Low
T17	Mature ash in field boundary hedgerow. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T18	Mature ash in field boundary. Some storm damage and cavities in the crown.	Moderate
T19	Mature pedunculate oak in field boundary. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T20	Mature pedunculate oak in field boundary. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T21	Mature ash in field boundary hedgerow. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T22	Mature pedunculate oak in field boundary hedgerow. Some cracks in limbs but main stem cluttered.	Moderate
T23	Mature pedunculate oak in field boundary hedgerow. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T24	Mature pedunculate oak in field boundary hedgerow. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T25	Mature ash in field boundary hedgerow. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible

Tree Reference	Description	Bat Roost Potential
T26	Mature pedunculate oak in field boundary hedgerow. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T27	Mature pedunculate oak in field boundary hedgerow. Some storm damage resulting in cavities in main stem.	Low
T28	Mature pedunculate oak in field boundary hedgerow. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T29	Mature pedunculate oak in field boundary hedgerow. Recent storm damage but tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding.	Negligible
T30	Large mature copper beech in road verge. Tree has no bat roost potential features such as cracked bark, cavities in the limbs/ trunk and ivy cladding. Main stem is heavily cluttered.	Negligible
T31	Mature ash in roadside boundary hedgerow. Tree has dense ivy cladding but no other visible bat roost potential features.	Low
T32	Mature ash in fragmented field boundary hedgerow. Tree has dense ivy cladding but no other visible bat roost potential features.	Low
T33	Mature ash in fragmented field boundary hedgerow. Tree has dense ivy cladding but no other visible bat roost potential features.	Low
T34	**Mature crack-willow (partially collapsed) in field boundary hedgerow associated with ditch. Tree has some areas of cracked and flaking bark but no obvious cavities in the limbs or main stem.**	**Negligible**
T35	**Semi-mature ash with no bat roost potential.**	**Negligible**
T36	**Semi-mature ash with no bat roost potential.**	**Negligible**
T37	**Mature twin-stemmed ash with no bat roost potential.**	**Negligible**
T38	**Mature ash. Dead branch on southern aspect has potential cavities that may be suitable for roosting bats.**	**Moderate**
T39	**Mature pedunculate oak with no bat roost potential.**	**Negligible**
T40	**Mature twin-stemmed ash with no bat roost potential.**	**Negligible**
T41	**Mature ash with no bat roost potential.**	**Negligible**
T41	**Mature ash with no bat roost potential.**	**Negligible**
T42	**Mature ash with cluttered main stem and no bat roost potential.**	**Negligible**

Tree Reference	Description	Bat Roost Potential
T43	**Mature pedunculate oak. Dead limb on northern aspect but does not have any cavities that may be suitable for roosting bats.**	**Negligible**
T44	**Mature pedunculate oak. Several dead limbs but does not have any cavities that may be suitable for roosting bats.**	**Negligible**

6.136 A total of 44 trees (T) and four tree groups (TG) have been appraised for their potential to support roosting bats. A total of four trees (T5, T12, T15 and T34) and three tree groups are bisected by the pipeline (TG1, TG2 and TG4) (highlighted in bold text in Table 6.13). A further 11 trees (also highlighted in bold text in Table 7.13) are on the edge of the Site, and therefore have the potential to be affected (T35 to T44). Of these, one tree is appraised to have moderate bat roost potential (T38), two trees have low bat roost potential (T5 and T15), and three tree groups have low bat roost potential (TG1, TG2 and TG4).

6.137 Following consultation with the design team, the pipeline route was amended to ensure that the majority of the trees with moderate or low bat roost potential (i.e. trees T5, T15, T38 and TG2) were not directly affected and would therefore not require removal. The use of a non-open cut technique to cross the River Derwent means that TG4 will similarly not be affected, because the pipeline receiving trench will be on the south side of the tree belt.

6.138 Only impacts on TG1 were not able to be avoided and therefore these trees were subject to a tree climbing survey by licensed bat surveyors to identify whether any of the identified cavities would reasonably be expected to be considered bat roosts.

6.139 Four trees in TG1 were identified as having cavities that provided potential roosting locations for bats and were subject to aerial inspection. All identified cavities were inspected using a torch and endoscope by a licensed bat ecologist. No evidence of bats was found in any of the cavities inspected. The aerial survey was undertaken in February 2014, and the Phase 1 Habitat survey in July 2014 did not identify any new features of bat roost potential associated with TG1. It is therefore reasonable to conclude that the results of the aerial inspection remain valid, and that TG1 does not support roosting bats.

6.140 Given the nature of the cavities identified, which were generally open and exposed, thus not providing the sheltered environment favoured by roosting bats, limited potential for use in the future by roosting bats was identified. It is therefore reasonable to assume that the trees do not support roosting bats.

Evaluation

6.141 None of the trees identified as having the potential to support roosting bats will be directly affected by the Development (see above).

6.142 The forestry plantation provides suitable habitat for foraging or commuting bats, given the abundance of woodland 'rides' and 'glades' that bats prefer, although roosting opportunities are limited given the presence of coniferous trees that do not typically provide suitable roosting opportunities for bats.

6.143 Based on the relative abundance and diversity of bat species identified in the wider local area, it is considered that bats are common and widespread throughout this part of Ryedale. The diversity of species indicates that the habitats within the wider local area provides good quality roosting and foraging habitat for bats, with the exception of the large arable fields along the River Derwent floodplain, which are less suitable for foraging bats. The prevalence of large arable fields in the Derwent floodplain results in habitat of lower quality for foraging bats, since it is unlikely to support a good assemblage of invertebrate prey. The more mature hedgerows and uncultivated headlands, south of the River Derwent, particularly around KGS, are likely to be of higher value to foraging bats. When considered in the context with the wider area, the Site represents a small area of the total resource available for bats in the local area and is evaluated to be of local nature conservation value only to bats.

Reptiles

6.144 The desk study identifies that adder (*Vipera berus*), slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*) have been recorded within the study area in the forestry plantations in the Dalby Forest and Wykeham areas, which are north-west and south-east respectively of the Site. Abundant suitable habitat for reptiles is present within the forestry plantation and its clear felled areas and linear 'rides'. It is concluded that common lizard, slow worm and adder are highly likely to be present within areas of forestry within the Site.

6.145 No suitable habitat for reptiles has been identified in the southern area of the Site (i.e. south of the A170), although the occasional presence of hunting grass snake (*Natrix natrix*) in the riparian habitat associated with the ditches and watercourses cannot be discounted.

6.146 Suitable potential reptile habitat is highlighted on Figure 6.3.

Evaluation

6.147 Slow worm, adder and common lizard are likely to be widespread and relatively common within the forestry plantation of the North York Moors National Park, which is a known county stronghold for reptiles given the abundance of suitable habitat. It is evaluated that the reptile populations within the forestry plantation are of no more than local value to nature conservation.

Water Vole

6.148 The Site crosses the River Derwent approximately 2 km west of the village of Yedingham. There are several records of this species from the Upper Derwent close to Yedingham, with the most recent records in the early 2000s around Low Newton Grange, which lies approximately 1 km to the west of the Site. It is therefore highly likely that water vole is present in the River Derwent, although no evidence of water vole burrows was identified in the banks of the river at the pipeline crossing point.

6.149 Ditches within the study area have been appraised for their potential to support water vole. Where possible, ditch banks were searched for evidence of water vole such as latrines, burrows and feeding remains. A summary of the survey is provided in Table 6.14 below. Ditches directly crossed by the pipeline route (11 ditches in total) are highlighted in bold text. Ditches appraised to be potentially suitable for water vole are mapped on Figure 6.3.

Table 6.14: Summary of Water Vole Appraisal and Survey of Ditches

Ditch Reference	Description	Water Vole Suitability
D1	Steep-sided field drainage ditch at base of mature hedgerow (H6). Ditch has steeply profiled banks c. 1 m deep, c. 0.5 m wide and supports no marginal or aquatic vegetation.	No field signs observed. Low suitability.
D2	**Steep-sided field drainage ditch at base of mature hedgerow (H7). Ditch has steeply profiled banks c. 1 m deep, c. 0.5 m wide and supports no marginal or aquatic vegetation.**	**No field signs observed. Low suitability.**
D3	Steep-sided field drainage ditch at base of mature hedgerow (H8). Ditch has steeply profiled banks c. 1.5 m deep, c. 0.5 m wide and supports no marginal or aquatic vegetation. Ditch is culverted beneath road and continues south through farmland where it is open and unshaded with a relatively fast flow. Ditch flows into Friar Dike (D4)	No field signs observed. Low suitability.
D4	**Friar Dike. Substantial ditch with a more natural course, into which numerous field drains flow. Ditch is 1 m wide with vertical 2 m banks and is heavily shaded by hedgerow on southern bank (H13). No marginal or aquatic species and appears to have been recently reprofiled.**	**No field signs observed. Low suitability.**

Ditch Reference	Description	Water Vole Suitability
D5	Steep-sided field drainage ditch c. 0.5 m wide with vertical 1 m banks. No aquatics or marginal and appears to have been recently cleared (arisings are piled on banks). Heavily shaded by adjacent hedgerow (H13).	No field signs observed. Low suitability.
D6	Field drainage ditch with a slow flow approximately 0.5 m wide and shaded by line of white willow on northern bank (TG3). No marginal or aquatic species, banks overgrown with tall ruderal species.	Low suitability but has direct habitat connectivity with River Derwent.
D7	**Small drainage ditch through floodplain that is c. 0.5 m wide and dominated by hard rush with little water.**	**Low suitability.**
D8	Steep-sided field drainage ditch at base of mature hedgerow (H19). Ditch has steeply profiled banks c. 1.5 m, is c. 0.5 m wide and supports no marginal or aquatic vegetation.	Low suitability.
D9	Steep-sided field drainage ditch at base of mature hedgerow (H20). Ditch has steeply profiled banks c. 1.5 m, is c. 0.5 m wide and supports no marginal or aquatic vegetation.	No field signs observed. Low suitability.
D10	**Steep-sided field drainage ditch at base of mature hedgerow (H23). Ditch has steeply profiled banks c. 1.5 m, is c. 1 m wide and supports abundant aquatic and marginal species including yellow flag iris, water starwort sp., bulrush, floating water plantain, water-cress and fool's water-cress.**	**No field signs observed. Moderate suitability.**
D11	**Steep-sided field drainage ditch at base of mature hedgerow (H24). Ditch has steeply profiled banks c. 1.5 m, is c. 0.5 m wide and supports some aquatic and marginal species including water starwort sp., bulrush, and floating water plantain. The ditch appears relatively stagnant and is very shallow. Evidence of brown rat occupation.**	**No field signs observed. Moderate suitability.**
D12	**Roadside ditch adjacent to hedgerow (H27). Dry and choked with tall ruderals.**	**Not suitable.**
D13	**Roadside ditch adjacent to hedgerow (H28). Dry and choked with tall ruderals.**	**Not suitable.**
D14	**Steep-sided field drainage ditch at base of mature hedgerow (H30). Ditch has steeply profiled banks c. 1.5 m, is c. 1 m wide and fast flowing. No aquatic or marginal species were recorded.**	**No field signs observed. Low suitability.**
D15	**Steep-sided field drainage ditch with adjacent hedgerow (H32) that was dry at the time of the survey and choked with tall ruderals and bramble.**	**Not suitable.**
D16	**Steep-sided field drainage ditch at base of mature hedgerow (H34). Ditch has steeply profiled banks c. 1.5 m, is < 0.5 m wide. No aquatic or marginal species were recorded.**	**No field signs observed. Low suitability.**
D17	**Steep-sided field drainage ditch at base of mature hedgerow (H35), heavily shaded. Ditch has steeply profiled banks c. 1.5 m, is c. 1 m wide with a relatively fast flow. No aquatic or marginal species were recorded.**	**No field signs observed. Low suitability.**
D18	Small drainage ditch on perimeter of plantation woodland. Ditch is steep-sided and < 0.5 m wide, heavily shaded with no aquatic or marginal species. Evidence of brown rat occupation.	Low suitability.

6.150 The majority of the ditches crossed by the Site are evaluated to be of low suitability for water vole, largely as a result of their lack of aquatic and marginal species to provide a source of food. The network of ditches to the south of Wilton Ings Lane in the floodplain of the River Derwent also offer some potential for a resident water vole population particularly

the more substantial, well vegetated ditches south of the River Derwent such as D10 and D11.

6.151 Although no water vole field signs were observed in any of the ditches during the survey, it is possible that such signs may have been missed given the height of the bankside vegetation at the time of the survey in spring and early summer 2013. Given that this species has been recorded on the River Derwent in the last 10 years, it is almost certain that water vole is present on the Derwent and is likely to utilise other linked ditches at times, including when they are displaced from the river during flood conditions. Therefore, some of the ditches that have been evaluated as being of low suitability may be used on occasion by transient and dispersing water voles.

Evaluation

6.152 Water vole is relatively widespread in Ryedale District, although in line with national trends, populations have been recorded to be in decline in the area over the last 20 years largely as a result of mink predation and the decline of suitable habitat due to agricultural intensification and drainage engineering (Ryedale BAP), and is subsequently listed on the Ryedale BAP. Based on the desk-study results, it is reasonable to conclude that water vole is present on the River Derwent, and may be present in drainage ditches connected to the river in the southern part of the pipeline route. It is evaluated that the water vole population in the study area is of county importance given the recent declines and continuing threats to the species from mink predation.

Otter

6.153 The Development crosses the River Derwent west of Yedingham. The NEYEDC holds several records of otter (*Lutra lutra*) within the study area, including on the River Derwent at Yedingham and it appears likely that this species is relatively widespread in the region. In addition, the lower reaches of the River Derwent are designated as a Special Area of Conservation (SAC), for which otter is a qualifying species. The River Derwent SAC is approximately 5 km downstream of the proposed pipeline crossing point at Yedingham.

6.154 The banks of the River Derwent at the proposed pipeline crossing point are open and unshaded, and do not support any bankside vegetation that could provide otters with cover for potential holt or couch sites. It is concluded that otters, although undoubtedly present on the Derwent, are not resident in the section to be crossed by the Development, and are present on an occasional transitory basis only whilst foraging or on passage.

6.155 None of the ditches crossed by the Development provide sufficient cover or source of food to support a resident population of otter. However, given that the ditches lie in the floodplain and provide a well-connected network, these ditches may be used by foraging or dispersing otter. However any such usage is unlikely to be on anything other than a transient basis.

6.156 Habitat suitable for otter is highlighted on Figure 6.3.

Evaluation

6.157 Otter is widespread throughout the River Derwent and its catchment, and is one of the primary species for which the River Derwent SAC was designated. Following national trends, otter distribution and numbers have expanded significantly in recent years, and a recent survey of the River Derwent catchment identified positive signs for otter at 15 of 20 sites surveyed in 2009 - 2010, an increase of 115 % from the 2000 – 2002 survey (Environment Agency, 2012)[xxxiv]. The section of River Derwent crossed by the pipeline route does not provide any suitable habitat for resident otter due to the lack of bankside tree/ shrub cover to provide suitable holt or couch sites. It is concluded that this section of the River Derwent is likely to be used on a transient basis only by foraging or passage otter. It is therefore evaluated that otter is of local nature conservation value only in the context of this assessment, and not withstanding its European legislative protection.

White-clawed crayfish

6.158 The NEYEDC holds one record of white-clawed crayfish (*Austropotamobius pallipes*) in the study area from the River Derwent in 1984. A research and development document published by the Environment Agency in 2001 confirms the presence of white-clawed crayfish in the River Derwent at West Ayton (c. 10 km east) during embankment works (Environment Agency, 2001[xxxv]). Given that there are no records of the non-native signal crayfish (*Pacifastacus leniusculus*) in the local area, it is reasonable to assume that the native population remains in the Derwent and has not been eradicated by crayfish plague.

6.159 Habitat suitable for white-clawed crayfish is highlighted on Figure 6.3.

Evaluation

6.160 Further survey is required to determine the presence/ absence of white-clawed crayfish in the River Derwent. However, on the balance of evidence collected during the desk-based

study, it appears that the River Derwent is a notable stronghold for white-clawed crayfish in North Yorkshire. Assuming this species is present in the River Derwent, and given its national rarity, it is evaluated that the white-clawed crayfish population is of national nature conservation value.

Other Species

6.161 Incidental records of roe deer (*Capreolus capreolus*) and brown hare (*Lepus europaeus*) were made during the Phase 1 Habitat surveys.

6.162 It is likely that deer are widespread and common throughout suitable habitat within the forestry plantation in the northern part of the study area. There is less suitable habitat for this species south of the A170 where the land comprises large arable fields and very little woodland. Given that deer are not conferred any legislative protection as a result of its nature conservation value, it is not considered further in this assessment.

6.163 There is abundant suitable habitat for brown hare within the study area, with large arable fields in the floodplain of the River Derwent and extending up to the edges of the forestry plantation north of the A170. It is likely that this species is widespread and relatively common throughout the study area. It is evaluated that the brown hare population associated with the study area is of local nature conservation value only.

6.164 The desk study returned numerous records of hedgehog in the study area, and there is abundant suitable habitat for this species in the woodland, scrub and long grassland habitats bisected by the Development. Hedgehog is a species in national decline, and is a NERC Act Section 41 species.

6.165 No species-rich grasslands that could potentially support a diverse assemblage of rare or notable invertebrates were recorded in the study area.

Future Baseline

6.166 In the absence of the Development, assuming the forestry plantation continues to be managed by the Forestry Commission for commercial forestry, there may be some changes in the distribution of dense coniferous woodland should any blocks within the Site be felled by the time of the future baseline year of 2015. This may result in additional suitable nesting habitat for nightjar being created within the study area.

6.167 In the absence of the Development, arable habitat present within the Study Area is unlikely to change significantly (assuming the fields remain under agricultural tenancy) up to the future baseline year of 2015. There may be variations in crop regime that result in the Site becoming more suitable, or less suitable depending on the crops grown, for ground nesting birds.

6.168 The scrub currently becoming established on the topsoil storage bund in EMS Well Site may also invade further, lowering the suitability of this habitat for reptiles, but increasing opportunities for nesting birds as the scrub matures.

Likely Significant Effects

6.169 The potential impacts, and the significance of the effect of those impacts on ecological receptors, are characterised in the absence of mitigation measures beyond those incorporated directly into the design of the Development for the construction, operational and decommissioning and restoration phases of the Development. Impacts may be direct (i.e. when a habitat and/ or species is lost to development) or indirect (i.e. when adjacent habitats or species are remotely affected, or when factors that relate to the Development, but are not actually part of the Development itself, influence ecology or features of nature conservation value. For example, increased disturbance to birds during the construction phase of a development, or dust smothering of vegetation).

6.170 Impacts are only considered in detail when there is a reasonable likelihood of an effect on a receptor of nature conservation importance. As discussed in the Methodology section, effects can be either significant (moderate or major) or not significant (negligible or minor).

6.171 Full details on the Development are provided in Chapter 3 (Site and Development Description) and are therefore not reproduced in detail in this chapter.

Construction

Statutory Designated Sites

North York Moors National Park

6.172 The Development is located partly within the North York Moors National Park, although only the EMS Well Site and some of the northern most sections of pipeline (c. 2 km in total) between EMS Well Site and Warren House Farm lie within the NYMNP boundary. Habitat within the footprint of the Development includes conifer plantation, which is under the

management of the Forestry Commission. The felling of trees within the Site would fall under the normal permitted activities within this part of the North York Moors National Park. The evaluation of the Development's impacts on the North York Moors National Park as a whole does not therefore fall within the remit of the ecological assessment.

North York Moors SPA/ SSSI

6.173 The Development will not result in any direct impacts on the North York Moors SPA/ SSSI. There is also no potential for the sensitive habitats within the boundary of the designated site to be indirectly affected as a result of dust deposition, given the distance between the designated site and the Development.

6.174 The North York Moors SPA/ SSSI is designated on the basis of the important breeding bird assemblages it supports. Given that such species are mobile there is the potential for SPA/ SSSI populations of birds to be present outside the designated site boundary, and potentially within habitats affected by the Development. However, there is no suitable nesting habitat for the SPA qualifying species merlin and golden plover within the Site, since these species require heath and moorland for nesting. Habitats within the Site also do not provide suitable nesting habitat for species recorded in the SSSI, such as whinchat, wheatear and ring ouzel, which prefer extensive tracts of open heathland and moors. The small linear bands of heath present along the rides and glades of the forestry do not provide sufficiently extensive habitat for these species.

6.175 There is no potential for noise or visual disturbance to breeding bird populations in the SPA/ SSSI given the distance between the Development and the designated site, although there is potential for displacement of foraging individuals. The noise impact assessment concludes that the construction noise will be transitory and limited in duration with respect to (human) noise receptors (Chapter 9: Noise and Vibration). The majority of the nearest human receptors, which are all several kilometres from the North York Moors SPA/ SSSI, will not experience daytime noise levels in excess of 55dB $L_{Aeq,1h}$, i.e. within the ambient range. It is therefore reasonable to assume that construction noise levels will have attenuated to below the ambient range at the North York Moors SPA/ SSSI. Any displacement of foraging SPA/ SSSI birds is considered to be negligible given the abundance of undisturbed suitable foraging habitat in the wider local area. It is assessed that the Development will not result in any significant effects on the breeding bird populations of the North York Moors SPA/ SSSI.

River Derwent SAC

6.176 The Development will not result in any direct impacts on the River Derwent SAC, since the designated site boundary is c. 6 km from the proposed crossing point of the pipeline at Yedingham. As the crossing point is upstream of the SAC, there is the potential for indirect effects on the SAC due to the habitat connectivity. However, the River Derwent will be crossed using a non-open cut directional drilling or a suitable alternative installation technique, and therefore it is assessed that there is no potential for indirect impacts on the River Derwent e.g. as a result of pollution/ siltation of the watercourse at the crossing point.

6.177 Furthermore, the legislative compliance measures required to be adopted during the construction phase will minimise the risk of a pollution event occurring as a result of works in close proximity to the watercourse. It is assessed that the Development will not result in any impacts on the River Derwent SAC.

6.178 The Development is not directly connected with, or necessary for, the management of the River Derwent SAC and therefore a report to inform HRA screening has been completed to assist the statutory authorities with their obligations in respect of the Habitats Regulations (see Appendix 6.9). This report was submitted as part of the consented Ebberston Moor 'A' Well Site to Knapton Generating Station Pipeline planning application, for which potential impacts on the River Derwent SAC are the same as those associated with the Development given that this section of the pipeline route is identical. The report concluded that no 'likely significant effects' (LSE) on the River Derwent SAC were predicted due to the use of a non-open cut technique to cross the river.

Eller's Wood and Sand Dale SAC/ SSSI

6.179 The Development will not result in any direct impacts on the Eller's Wood and Sand Dale SAC/ SSSI, since the designated site boundary is c. 1.6 km from the Development. The SAC is designated for its population of Geyer's whorl snail, which is entirely confined to the tufa springs within the SAC. There is no potential for the Development to result in any adverse effects on the tufa springs, given the distance between the SAC and the Site. The SAC/ SSSI habitat is therefore spatially separated from the Site by the forestry plantation that lies between the two, and no potential for indirect impacts has been identified.

6.180 The SSSI is primarily designated for its diverse assemblage of floral species that are associated with the springs/ fen along the lower slope of Sand Dale, which drain into Thornton Beck that forms the boundary of the SSSI. There is no potential for the

Development to result in adverse effects on Thornton Beck, or any watercourses that drain into Thornton Beck that may indirectly affect the SSSI habitats.

6.181 Emissions from construction traffic will be broadly concurrent with existing forestry operations, and it is therefore reasonable to conclude that such operations will not result in any indirect impacts on the SSSI. The Development is c. 1.6 km from the SAC/ SSSI, and there is therefore no potential for indirect adverse effects on habitats to occur as a result of dust deposition when topsoil stripping is being undertaken since any fugitive dust emissions would be restricted to the area immediately surrounding the Site. On this basis, it is concluded that the construction phase of the Development will result in negligible effects on Eller's Wood and Sand Dale SAC/ SSSI.

Nabgate SSSI

6.182 The Development will not result in any direct impacts on the Nabgate SSSI, since the designated site boundary is c. 0.8 km from the pipeline route. The SSSI is designated for its species-rich calcareous grassland, of which there is no contiguous habitat connectivity between the SSSI and the Site. The SSSI habitat is therefore spatially separated from the Site by the forestry plantation that lies between the two.

6.183 As discussed above in respect of Eller's Wood and Sand Dale SAC/ SSSI, there is no potential for indirect adverse effects on designated habitats as a result of construction traffic emissions or fugitive dust emissions. Effects on Nabgate SSSI are therefore assessed as negligible.

Troutsdale and Rosekirk Dale Fens SSSI

6.184 The Development will not result in any direct impacts on Troutsdale and Rosekirk Dale Fens SSSI as the SSSI does not have any habitat connectivity with the Site. There is no potential for any indirect hydrological effects on the groundwater that may affect the species assemblages associated with the designated spring and flush fen habitats, given that the SSSI is in approximately 1.6 km from the Site.

6.185 As discussed above in respect of Eller's Wood and Sand Dale SAC/ SSSI, there is no potential for indirect adverse effects on designated habitats as a result of construction traffic emissions or fugitive dust emissions. Effects on Troutsdale and Rosekirk Dale Fens SSSI are therefore assessed as negligible.

Summary

6.186 It is assessed that the construction of the Development will result in negligible effects on statutory designated sites.

Non-statutory Designated Sites

6.187 The Development will not result in any direct impacts on the four SINC sites identified within the study area. All of the SINC sites are in excess of c. 1 km from the Development and therefore, as discussed with respect to SSSIs, there is no pathway by which dust deposition during topsoil stripping could result in adverse effects on vegetation.

6.188 The increase in road traffic movements associated with the construction phase (see Chapter 8) at the A64/ B1258 junction, where the West Knapton Road Verge SINC is located, will not result in any indirect impacts on the SINC e.g. as a result of vehicles pulling into the verge to pass each other. This is because the SINC habitat is associated with a broad verge on the south side of the A64 to which there is no direct vehicular access due to the presence of a kerb. It is reasonable to assume that vehicles associated with the construction phase will not damage the site, because the A64 is sufficiently wide for heavy good vehicles and there would be no requirement for traffic to drive over the verge.

6.189 It is concluded that there is no potential for the Development to result in adverse effects on non-statutory designated sites.

Habitats

6.190 The majority of the habitats directly impacted by the Development do not meet the criteria for any North York Moors National Park and Ryedale Habitat Action Plans and are dominated by arable farmland of negligible nature conservation value. The uncultivated arable headlands under stewardship agreements in the southern part of the Site (i.e. south of the A170) are evaluated as being of local value given that they represent examples of the local BAP habitats. However, the vegetation and habitats within the Site are typical of the wider environment with the plant species being common and widespread and the habitats generally having low species diversity. The temporary loss of this habitat during the construction phase of the Development is assessed to be a minor impact resulting in a negligible effect.

6.191 Areas of forestry plantation will be lost in the northern part of the Site between the EMS Well Site and Warren House Farm. However, much of the pipeline will be laid along the route of

existing tracks to minimise the amount of felling required. The forestry plantation is a small part of a much wider resource that is in any case managed for commercial forestry and as such has a finite lifespan. The loss of forestry plantation within the Site is on a much smaller scale to that which would be lost to commercial forestry operations as described in Chapter 14 (Socio-Economics). When considered in context with the wider resource available, the small scale medium to long term loss of forestry plantation resulting from the construction of the Development is assessed to be a minor impact resulting in a negligible effect.

6.192 Approximately 1.6 km (linear length) of hedgerows will be directly impacted by the Development, although none of the hedgerows were classified as 'important' under the Hedgerow Regulations 1997 in terms of their ecological value.

6.193 For the most part, the impacts are temporary and reversible, although it is acknowledged that hedgerows and woodland will take longer to re-establish than grassland and arable farmland. It is assessed that the Development will result in a major, albeit temporary and largely reversible impact. This is assessed to be a minor adverse effect that is not significant.

6.194 Dust emissions arising from topsoil stripping will be controlled through standard dust suppression measures as described in Chapter 10 (Air Quality) and any fugitive dust deposition is likely to be limited to a level that is highly unlikely to cause adverse effects on surrounding drainage network and habitats.

Breeding Birds

6.195 Construction of the Development will result in the direct loss of nesting bird habitat associated with plantation woodland, hedgerows and arable farmland. This loss is considered in respect of the Schedule 1 species goshawk and nightjar below. The loss of habitat supporting common breeding species is temporary and reversible, and given the abundance of suitable alternative nesting habitat in the wider local area, any impacts are not considered to result in significant effects on local populations of nesting birds. The impact is assessed as moderate resulting in a minor adverse effect.

<u>Goshawk</u>

6.196 There are no known records of this species nesting within the areas of forestry plantation to be lost. There will therefore be no direct impacts on nesting goshawk sites.

6.197 There are also no known records of goshawk within the study area, and it is therefore assumed that this species is not nesting within 400m of the Development. Goshawks are known to be highly adaptable to human-altered landscapes and in the absence of persecution are tolerant of intense human activities in some areas, even successfully nesting in urban areas (Ruddock & Whitfield, 2007)[xxxvi]. Forestry Commission guidance indicates that a disturbance-free zone of 400m should be established around occupied nest sites between February to July (inclusive) to minimise the risk of illegal disturbance to nesting goshawk during forestry operations (Petty 1996). It is therefore concluded that as there are no known goshawk nest sites within 400m of the Site, there is no potential for indirect adverse effects as a result of noise and visual disturbance impacts during the construction zone, since any nest sites lie outside the 400m zone of influence in which disturbance may be expected to occur.

Nightjar

6.198 There are records of nesting nightjar within c. 1 km of the Site, and given the presence of potentially suitable habitat for this species in close proximity to the Development at Warren House Farm, there is therefore the potential for the Development to result in the disturbance to nesting nightjar during the construction period, should construction coincide with the breeding season. No habitats that are potentially suitable for nightjar will be directly impacted by the Development.

6.199 Nightjars rely on their cryptic plumage to escape detection and this trait is likely to result in low active disturbance distances, with birds on only displaying a visible disturbance response (i.e. flushing from the nest) when approaching predators are close. Studies have determined that the distances at which this response occurs is less than 10m during the egg incubation period, increasing to 50 – 100m during chick rearing (Ruddock & Whitfield, 2007)[xxxvii]. However, other publications also highlight the potential for non-visible disturbance responses as a result of disturbance at distances greater than 100m that may also potentially have a detrimental effect on nesting nightjar. Such 'passive' disturbance is difficult to determine and to quantify its effects on nightjar breeding success (Ruddock & Whitfield, 2007)[xxxviii].

6.200 Other areas of this clear felled section are within the typical 100m range from the Site in which a visual disturbance response may be elicited in nesting nightjar during chick rearing. It is assumed that should any nightjars be nesting at this location, they will be habituated to current ongoing forestry operations at this location.

6.201 The area of clear felled forestry plantation identified north of Warren House Farm lies adjacent to several public rights of way that are well used by cyclists and walkers. It is concluded that nightjar, if present in this habitat, would prefer to nest in the central parts away from the boundaries that are subject to regular disturbance as described above. It is therefore possible that nest sites are in excess of 100m from the Development, and outside the zone in which a disturbance response is likely. Furthermore, the potentially suitable habitat for nightjar at this location is buffered from the effects of noise/ visual disturbance due to the presence of a small retained woodland band along the eastern edge of the felled plantation. Construction traffic movements and earth works using the existing roads will be consistent with ongoing forestry operations, disturbance to which it is assumed that nightjars are relatively well habituated to, given that their numbers are expanding rapidly within the North York Moors National Park (Conway & Henderson, 2005). Any such disturbance associated with construction will also be temporary in nature.

6.202 With regards to noise and visual disturbance arising from construction works, there is the potential for displacement to occur of any nightjars nesting within the 100m zone of the Site in which a disturbance response may be elicited during the breeding season. However, as discussed in respect of direct habitat loss, the temporary displacement of individual nightjars is considered to be a minor impact given the abundance of suitable alternative nightjar nesting habitat in the wider forestry plantation. This is assessed to result in a negligible effect on nesting nightjars.

Badger

6.203 See Confidential Badger Appendix (Appendix 6.6).

Bats

6.204 No bat roosts will be affected by the Development.

6.205 A total of three trees and three tree groups were identified as having the potential to support roosting bats. Further survey work enabled the downgrading of one tree group (TG1) to negligible bat roost potential following a tree climbing survey that did not find evidence of bats. Through consultation with the design team, route tweaks were implemented to avoid direct impacts on trees within the route corridor; T5, T15, T38 and TG2. The use of a non-open cut technique to cross the River Derwent will negate impacts on TG4 because the tunnel receiving pit will be on the south side of the tree group and the pipeline will therefore

be tunnelled beneath the trees. A summary of this assessment is provided below in Table 6.14, to demonstrate that the Development will not affect any potential bat roosts.

Table 6.14: Summary of Bat Roost Impact Assessment

Tree Reference	Bat Roost Potential (see Table 6.13)	Impact Avoidance Measures	Residual Impact
T5	Low	Route tweak to avoid tree, implementation of appropriate RPA will ensure no indirect impacts.	Negligible
T15	Low	Route tweak to avoid tree, implementation of appropriate RPA will ensure no indirect impacts.	Negligible
T38	Moderate	Route tweak to avoid tree, implementation of appropriate RPA will ensure no indirect impacts.	Negligible
TG1	Downgraded from Low to Negligible following tree climbing survey.	Not required.	Negligible
TG2	Low	Route tweak to avoid tree, implementation of appropriate RPA will ensure no indirect impacts.	Negligible
TG4	Low	Non-open cutting of River Derwent will ensure no impacts on tree group, as pipeline receiving pit will be on the south side of the tree group.	Negligible

6.206 The construction phase will necessitate the removal of hedgerow sections within the footprint of the Development, and therefore there is the potential for adverse effects on foraging or commuting bats that may be using these linear features. However, as these hedgerows will be re-planted upon completion of construction, any impacts will be relatively short term and temporary in nature. Furthermore, the gaps created are not anticipated to create barriers to bat movement, since there are already similar gaps within the fragmented hedgerow network that bats must negotiate. Impacts on foraging or commuting bats associated with the construction of the Development are assessed to be minor, resulting in a minor adverse effect that is not significant.

6.207 Forestry plantations to be bisected in the northern part of the route also provide suitable habitat for foraging/ commuting bats. Woodland plantation will not be fully reinstated post-

construction due to the requirement for the maintenance of a permanent right of access within 10m of the pipeline route. There is therefore the potential for more long term impacts on foraging or commuting bats. However, the opening up of clearings and the creation of more 'woodland edge' habitats that are favoured by foraging or commuting bats will potentially result in beneficial effects on this species.

6.208 Foraging bats using the woodland edge habitat around the northern perimeter of EMS Well Site may avoid any area of lighting disturbance during construction. However, all lighting will be designed to be directed down onto working construction areas and utilise high pressure sodium (SON) lamps to minimise spillage onto areas outside the Site boundary. It is therefore concluded that the construction phase is not likely to result in significant disruption to foraging or commuting bats. Consequently, it is assessed that there will be negligible effects on bat populations as a result of construction activities at EMS Well Site.

6.209 KGS is an operational and nocturnally lit facility. As there will be no changes to the operational usage of KGS during the construction of the Development, there is no potential for cumulative adverse effects on foraging/ commuting bats in the woodland surrounding the Site. It is assumed that any foraging/ commuting bats utilising the habitats in close proximity to KGS are habituated to the current levels of lighting within the Site.

Reptiles

6.210 The Development will result in the temporary loss of a small areas of potentially suitable reptile habitat associated with the edges of the forestry plantation and areas of clear felled woodland directly impacted by the pipeline route. However, given the abundance of suitable potential reptile habitat in other undisturbed areas of the forestry plantation, the loss of a small areas resulting from the Development is a minor impact resulting in a negligible effect on the locally important reptile population.

6.211 Disturbance to the ground during the construction phase may cause harm to reptiles, specifically adders, slow worms and common lizards that may be present within the Site. In the absence of mitigation, such actions may result in offences being committed under the Wildlife and Countryside Act 1981 (as amended). There is the potential for major impacts on individual reptiles and it is assessed that this will result in a moderate adverse effect.

Water Vole

6.212 The Development crosses a total of two ditches (D10 and D11) and the River Derwent that are considered to have moderate potential to support water voles, and six ditches (D2, D4, D7, D14, D16 and D17) that are considered to have low potential to support water voles.

6.213 The River Derwent will be crossed using a non-open cut directional drilling or a suitable alternative installation technique and therefore there is no potential for impacts on water vole habitats associated with the River Derwent.

6.214 In the absence of mitigation, there is the potential for adverse effects on water voles and their habitats associated with the numerous ditch crossings that will be open-cut. However, habitat losses through the open-cutting of ditches will be limited in both temporal and spatial extent and there is no potential for fragmentation of water vole populations since ditch and watercourse habitats will be fully re-instated post-construction. This is assessed to be a moderate impact resulting in a temporary moderate adverse effect.

Otter

6.215 Otter is present on the River Derwent, which is crossed by the Development. As the River Derwent will be crossed using a non-open cut directional drilling or a suitable alternative installation technique, impacts on otter are assessed to be negligible since there will be no direct impacts on otter foraging habitat, and no disruption to otter foraging activity.

White-clawed Crayfish

6.216 It is highly likely that white-clawed crayfish is present on the River Derwent, which is crossed by the Development, although further survey would be necessary to determine presence/ absence. However, the River Derwent will be crossed using a non-open cut directional drilling or a suitable alternative installation technique and therefore there is no potential for any impacts on this species or its habitats. No surveys for this species are therefore required, as there is no reasonable likelihood of them being affected by the Development.

Other Species

6.217 There will be impacts on arable farmland that is considered likely to support a locally important population of brown hare. However, given the limited nature of the works and that they will be undertaken across a single season, any such impacts will be minor. There is

an abundance of suitable breeding and foraging habitat for brown hare in the wider local area to provide alternative habitat should any hares be displaced by the construction of the Development. It is assessed that the construction of the Development will result in negligible effects on brown hare.

Completed Development

Statutory Designated Sites

6.218 There will be a requirement for the surface water drainage of EMS Well Site during the operation of the Development. However, surface water drainage will be treated separately and does not have the potential to result in polluted discharge into surrounding ditches and other watercourses. There is therefore no potential for water associated with the operation of the Development to enter the drainage system and potentially impact the Troutsdale and Rosekirk Dale Fens SSSI.

6.219 There is no potential for operational activities at EMS Well Site to result in indirect impacts on the North York Moors SPA/ SSSI through noise and visual disturbance to qualifying bird species foraging and breeding in habitats outwith the designated site boundary (see Chapter 9: Noise and Vibration). This is on the basis that any displacement of foraging SPA/ SSSI birds from the habitats immediately adjacent to the Site (which would experience the greatest operational noise levels) is considered to be negligible given the abundance of undisturbed suitable foraging habitat in the wider local area. It is therefore concluded that there is no potential for operational noise to result in disturbance to birds in the SPA/ SSSI and it is assessed that the Development will not result in any significant effects on the breeding bird populations of the North York Moors SPA/ SSSI.

6.220 There is the potential for visual disturbance to foraging birds (including those that are part of the North York Moors SPA/ SSSI populations) as a result of the presence of buildings and operational plant at EMS Well Site, as well as personnel and vehicle movements within the well site during the operational phase. However, the maximum building height is 4.8m and as the EMS Well Site is surrounded on two boundaries by mature forestry plantation, there will be visual screening of the buildings and vehicle/ plant movements within the well site by the existing retained vegetation. Visual disturbance associated with the operation of the Development is therefore assessed to result in a negligible effect on foraging birds that are part of the North York Moors SPA/ SSSI given the screening effect of the surrounding forestry plantation.

Non-statutory Designated Sites

6.221 No potential operational effects on non-statutory designated sites have been identified.

Habitats

6.222 All habitats affected by the pipeline will be restored to their previous state prior to the commencement of works, including re-grading of affected sections of ditch and the re-planting of hedgerows. A standard width of 10m must be kept free of trees to prevent damage to the pipeline and allow access for maintenance in perpetuity. Hedgerows will be reinstated along field boundaries crossed by the easement.

6.223 The creation and maintenance of a permanent right of access through the forestry will result in a linear 'ride' habitat that provides additional ecosytems for species such as invertebrates, reptiles and foraging bats. It is assessed that the operation of the pipeline will not result in any significant effects on habitats along the pipeline route.

6.224 The majority of impacts on habitats within EMS Well Site will occur during the construction phase due to the direct losses of vegetation. Site drainage of EMS Well Site will be via a closed system, with rainwater retained onsite prior to be being discharged to a soakaway via a three-phase oil interceptor (see Chapter 11: Water Resources and Flood Risk). However, any rainwater collecting within the new tank bunds will be taken off site in tankers to be processed at an off-site facility. Other by-products (e.g. condensate and rich amine) will be taken off-site site by tankers, and therefore surface water drainage does not have the potential to result in polluted discharge into surrounding drains. There will be no changes in water or air quality as a result of the operation of the Development at EMS Well Site and therefore no potential for adverse effects on habitats surrounding the Site.

Breeding Birds

6.225 The operation of the pipeline will not result in any impacts on breeding birds, since all habitats affected will be reinstated, and there are no above ground structures.

6.226 Operation of the EMS Well Site may result in noise and visual disturbance to breeding birds in the vicinity of the well site. This is considered in respect of the Schedule 1 species goshawk and nightjar below. With respect to other nesting species, given the abundance of suitable alternative nesting habitat in the wider local area, any impacts will be unlikely to result in significant effects on local populations of nesting birds, particularly given the

screening provided by the mature forestry plantation adjacent to the northern, eastern and southern boundaries of the Site. The impact is assessed as minor adverse.

Goshawk

6.227 As discussed in respect of construction impacts, there is no potential for noise or visual disturbance to nesting goshawk during the operational phase of the Development (in both scenarios), since there are no records of this species nesting within the zone of influence. The presence of mature forestry plantation surrounding the northern, eastern and western boundaries of the Site will attenuate potential noise and visual impacts arising from within the Site boundary, and it is therefore considered that there is no potential for adverse effects on goshawk in the event that this species establishes a nesting site within a 400m of the Site in the future. In any case, if a goshawk nest does become established within this zone during the operational phase, it must be assumed that the level of disturbance to birds is acceptable and can therefore be assessed as a negligible effect.

Nightjar

6.228 There is no potential for the operation of the pipeline to result in impacts on nesting nightjar since there are no above ground structures. There is no potentially suitable nightjar nesting habitat immediately adjacent to EMS Well Site, and therefore there is no potential for the operation of the well site to result in noise or visual disturbance to nesting nightjar.

Bats

6.229 There is no potential for the operation of the pipeline to result in impacts on bats since there are no above ground structures.

6.230 Foraging bats using the woodland edge habitat around the perimeter of EMS Well Site may avoid any area of lighting disturbance during the operation of the Development. However, all operational lighting will be designed to be directed down onto working areas to minimise spillage onto areas outside the Site boundary (see Chapter 7: Landscape and Visual). It is therefore concluded that the operation of the Development will not result in significant disruption to foraging or commuting bats. Consequently, it is assessed that negligible effects on bat populations are predicted as a result of the operational activities.

Reptiles

6.231 The operation of the Development will have a negligible effect on reptiles since there are no above ground structures. Potential impacts on reptiles will occur only during the construction phase associated with disturbance/ loss of habitats.

Decommissioning and Restoration

6.232 No additional impacts associated with the decommissioning and restoration phase of the Development have been identified. Given that no significant adverse effects on ecological receptors have been identified as part of the construction phase, it is reasonable to assume that there is no potential for adverse effects during the decommissioning and restoration phase of the Development. The restoration phase will aim to restore the pipeline route and EMS Well Site to a condition as close as practicable to its original state. Further details are provided in Chapter 3.

6.233 Any displacement of birds that are qualifying species of the North York Moors SPA/ SSSI, which may be foraging and breeding in habitats outwith the designated Site boundary, populations due to noise/ visual disturbance is considered to be negligible given the abundance of undisturbed suitable foraging habitat in the wider local area. It is assumed that decommissioning and restoration activities will be broadly concurrent with construction activities given that the impacts will be a 'reverse' of construction activities i.e. the site infrastructure and plant will be removed and the habitats restored. On this basis, as for the construction phase of the Development, it is assessed that the decommissioning and restoration phase will not result in any significant effects on the breeding bird populations of the North York Moors SPA/ SSSI.

6.234 There is no pathway by which the decommissioning and restoration at EMS Well Site could result in adverse effects on any non-statutory sites, since none lie within the potential zone of influence.

6.235 As discussed in respect of construction and operational impacts for EMS Well Site, there is no potential for noise or visual disturbance to nesting goshawk or nightjar during the decommissioning and restoration phase of the Development, since there are no records of this species nesting within the zone of influence.

6.236 The restoration of EMS Well Site to woodland, and removal of artificial lighting, will restore suitable foraging habitat within the Site boundary for bats, since during the construction and operational phases there will be no suitable habitat within the Site boundary.

6.237 During the short and medium term, before the re-planted trees reach the maturity of those surrounding the Site, this impact may be beneficial for bats since the presence of a more mosaic habitat type and in combination with the woodland edge habitat surrounding the ASite, may support a more diverse insect assemblage.

6.238 Impacts on foraging bats during the decommissioning and restoration phases are therefore assessed to result in a minor beneficial effect on foraging bats in the short to medium term.

Mitigation Measures

6.239 Mitigation is proposed to minimise the potential significant effects identified by the assessment. Mitigation measures reduce the severity of impacts, and hence the levels at which effects are considered significant.

6.240 The final details of any mitigation measures are likely to be developed as part of compliance with planning conditions for the Development, and will form part of any detailed environmental management undertaken. The contractor, relevant statutory agencies and nature conservation organisations may be involved in this, and measures relating to construction, decommissioning and restoration activities will be set out in a Construction Environmental Management Plan (CEMP).

Construction

Statutory Designated Sites

River Derwent SAC

6.241 The River Derwent will be crossed using a non-open cut directional drilling or a suitable alternative installation technique and as there is no potential for any adverse effects on the habitats e.g. as a result of pollution at the crossing point, no specific mitigation is considered necessary.

6.242 Pollution control measures will be implemented during the construction phase to minimise the risk of a pollution event in the working area close to the River Derwent in accordance

with national guidelines and legislation. Further information is provided in Chapter 5 and Chapter 11.

Other Statutory Designated Sites

6.243 No significant direct or indirect effects on any other statutory designated sites have been identified and therefore no mitigation is required.

Non-statutory Designated Sites

6.244 No significant direct or indirect effects on any non-statutory designated sites have been identified and therefore no mitigation is required.

Habitats

6.245 Dust emissions arising from topsoil stripping during the construction and decommissioning and restoration phases will be controlled through standard dust suppression measures to minimise dust deposition. This will therefore minimise the potential for smothering of vegetation beyond the Site boundary, and minimise the potential for siltation of the surrounding drainage network. Chapter 10 (Air Quality) provides more detail on the dust suppression measures to be implemented.

6.246 Topsoil and subsoil will be stored separately to ensure retention of the natural seed bank and to promote re-instatement of the natural habitat. Chapter 15 Ground Conditions. provides more information on the storage of topsoil and subsoil.

6.247 Dust emissions arising from topsoil stripping will be controlled through standard dust suppression measures to minimise dust deposition beyond the 30 m working width. This will therefore minimise the potential for smothering of vegetation beyond the site boundary, and minimise the potential for siltation of the surrounding drainage network. Chapter 10 Air Quality provides more detail on the dust suppression measures to be implemented.

6.248 All habitats will be reinstated post construction, with any affected sections of ditch re-graded to reflect the 'natural' profile and hedgerows replanted with native species of stock originating and grown in Britain in accordance with the canopy species present in undisturbed sections of each hedgerow.

Breeding Birds

6.249 All nesting birds are protected once nesting under the Wildlife and Countryside Act 1981 (as amended) and it is an offence to destroy or damage an occupied nest. To ensure that construction works comply with this legislation, vegetation clearance (including tree felling) will be undertaken outside the breeding bird season where possible (typically March to September inclusive).

6.250 Topsoil stripping across arable farmland will also be undertaken outside the breeding bird season where possible, to avoid ground nesting species that may be present. Measures to deter ground nesting birds (e.g. bird deterrent tape) in arable fields will be implemented prior to the onset of the breeding bird season if necessary. Similarly, netting of hedgerow sections to be removed can also be undertaken in advance of the breeding season, to prevent nest construction.

6.251 If vegetation clearance is unable to be undertaken outside the breeding bird season, all areas of vegetation will be checked by an ecologist prior to clearance. In the event that active nest sites are found, an appropriate buffer zone (c. 5m) will be established around the nest and works suspended in this zone until the nest has become unoccupied and any young have fledged.

Goshawk

6.252 Goshawk is afforded additional protection whilst nesting under the Wildlife and Countryside Act 1981 (as amended) through its inclusion on Schedule 1 of the Act, and it is an offence to disturb nesting goshawk or dependent young, as well as to destroy or damage their nests.

6.253 To address the low risk that goshawk may establish new nest sites in the forestry plantation within an approximate 400m radius of the Development, liaison will be undertaken with the Forestry Commission before the commencement of construction to establish whether any additional nest sites within those areas described above have been identified.

6.254 In the event that active goshawk nest sites are subsequently identified prior to the commencement of construction, additional mitigation is likely to be required. This is likely to require the maintenance of a 400 m disturbance-free zone between February and July inclusive. The assessment has concluded that there is no potential for adverse effects on goshawk as a result of noise during the operational phase of the Development as a result of

the screening effect of the surrounding forestry. Any such disturbance-free zone is therefore applicable to the construction phase of the Development only.

6.255 All tree felling works will be undertaken outside the breeding bird season (which is extended to include February due to the early nesting habits of goshawk) and therefore there is no risk of directly destroying active and occupied goshawk nests.

Nightjar

6.256 Nightjar is conferred additional protection through its inclusion on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and it is therefore illegal to damage or destroy its nest, or to disturb this species whilst on the nest or with dependent young.

6.257 To address the risk of damaging/ destroying nightjar nests, vegetation clearance within the felled areas of forestry plantation will be undertaken outside the breeding season (approximately April to August, with eggs laid from May onwards). It is not considered that the newly felled areas of forestry plantation within the Site will provide new suitable areas for nesting nightjar, since the ground flora cover will be sparse and will not provide the low growing heather-cover that this species favours for nesting. There is therefore no risk of nightjar nests becoming established in newly felled areas, and no specific mitigation to address this is proposed.

6.258 Site clearance works will be undertaken outside the breeding bird season, and therefore construction activities will have commenced by the time nightjars arrive on migration at the start of their breeding season. Therefore if nightjar nest sites are established in areas close to the Site during the construction phase, it can be assumed that the birds are tolerant to the level of disturbance experienced by construction activities associated with the Development and no specific mitigation is required.

Bats

6.259 Task-specific lighting (temporary columns) if required during construction will be directed and focussed downwards with appropriate lantern designs to reduce light spillage on to habitats outside construction areas.

6.260 Appropriate Root Protection Areas (RPA) will be implemented around the trees identified as having moderate/ low bat roost potential (T5, T15, T38 and TG3) to prevent any damage to the trees that could potentially affect a bat roost (if present). This negates the requirement for further survey of the trees.

Badger

6.261 See Confidential Badger Appendix (Appendix 6.6).

Reptiles

6.262 Reptiles are protected from injury/ killing under the Wildlife and Countryside Act (1981) as amended. The deadwood piles and loose heaps of soil/ pine needles throughout the forestry plantation provide potentially suitable habitat for reptile hibernation. If possible, it is recommended that these areas are cleared outside the winter period to avoid the reptile hibernation season. However, given that the woodland is recommended for clearance outside the breeding bird season, it is acknowledged that there is the potential for conflicts between the mitigation strategies for breeding birds and reptiles to occur.

6.263 Habitats potentially suitable for reptiles within the Site will be fenced with temporary reptile exclusion fencing as the forestry felling progresses, to prevent further migration of reptiles into working areas upon emergence from hibernation. The tree stumps will be left in situ until March to avoid disturbing reptiles that may be hibernating below ground in and amongst tree roots. Stumps will be grubbed out from March onwards when reptiles have emerged from hibernation to prevent the risk of killing or injuring hibernating reptiles. Grubbing out of stumps will be undertaken under ecological watching brief.

6.264 The felled areas will then be subject to a capture and translocation exercise using artificial refuges to attract basking reptiles. Given the limited impacts of the vegetation clearance when considered in the context of the availability of reptile habitat throughout the substantial areas of unaffected forestry plantation, it is not considered necessary to undertake habitat creation for translocated reptiles. Reptiles will therefore be translocated a short distance outside the fenced area, as it is considered that the habitat has sufficient capacity to accommodate translocated animals.

6.265 A minimum of 10 days of capture and translocation, plus five 'clear' days with no captures at the end of this period (i.e. 15 days) will be undertaken to demonstrate sufficient effort to clear the area of reptiles prior to the commencement of excavation works. Capture and translocation of reptiles will only be undertaken on suitable days and in accordance with standard methodology. A method statement will be developed and agreed with the Local Planning Authority (LPA) ecologist(s) prior to the commencement of works.

6.266 The potential presence of reptiles will be highlighted to site personnel as part of the site induction package. Any reptiles encountered incidentally during the works will be immediately moved to a place of safety if they are unable to escape unaided, and the advice of an ecologist sought.

6.267 Although not found during surveys, the presence of grass snake in the ditches crossed by the pipeline cannot be entirely ruled out. It is therefore important to ensure sensitive working practices are adopted when crossing ditches to prevent accidental killing/ injuring of grass snakes, which are protected under the Wildlife and Countryside Act 1981 (as amended). Progressive clearance of ditch vegetation will be undertaken to allow sufficient time for grass snakes to vacate impacted sections. Plant operatives will be made aware of the potential for this species to be present, and any snakes encountered during site clearance works will be captured and transported to a place of safety outside the Site if they cannot escape unaided.

Water Vole

6.268 No water vole field signs have been identified on any of the affected ditches during the survey. However, given that this species has been recorded on the River Derwent, it is possible that the species is present on the linked ditch network in the Derwent floodplain. Mitigation is therefore proposed to address the risk of killing or injuring water voles during the construction phase.

6.269 Prior to the commencement of construction, all of the identified ditches with water vole potential will be re-surveyed for water vole. Those ditches that do not have any evidence of water vole occupation will not be subject to any further constraints during the construction phase.

6.270 Where water vole occupation is confirmed in affected sections of the Site at any ditch/ river crossing, exclusion of water voles using the 'displacement technique' will be undertaken. This method of excluding water voles involves the removal of suitable bankside cover to encourage the passive movement of water voles away from affected areas. This methodology is considered acceptable for projects undertaken over short timescales where the impact is less than 100 m in extent, such as pipelines (Strachan et al., 2011).

6.271 Prior to the commencement of strimming, all burrows within the Site will be marked with coloured stakes. Vegetation within the working width (including an appropriate buffer zone of approximately 5m either side) will be strimmed to ground level until only bare earth remains and all arisings removed from Site. Three days after strimming, and following an interim survey by an ecologist to check for signs of water vole occupation, a destructive

search of the strimmed area will be undertaken. All burrows will be excavated using hand tools under the supervision of an ecologist, and any animals encountered will be caught and stored in a temporary container (cage) prior to immediate release outside the working width. Construction will commence immediately or soon after completion of the destructive search.

Otter

6.272 No mitigation is proposed for otter as no significant effects have been identified.

White-clawed Crayfish

6.273 No mitigation proposed. No further survey considered necessary because the River Derwent will be crossed using non-open cut directional drilling or a suitable alternative installation technique and therefore there is no potential for the Development to impact this species.

Other Species

6.274 No mitigation proposed as no significant effects have been identified.

Operation

6.275 No mitigation for the operational phase of the Development is proposed, on the basis that no significant effects on ecological receptors have been identified in the assessment.

Decommissioning and Restoration

6.276 No mitigation for the decommissioning and restoration phases of the Development is proposed beyond dust suppression measures at the EMS Well Site discussed above, on the basis that no significant effects on ecological receptors have been identified in the assessment.

Residual Effects

6.277 A summary of the impact assessment is provided in Table 6.15.

Construction

Statutory Designated Sites

6.278 The EcIA has concluded that the Development will result in negligible effects on Eller's Wood and Sand Dale SAC/ SSSI, River Derwent SAC, Nabgate SSSI, Troutsdale and Rosekirk Dale Fens SSSI and the North York Moors SAC/ SPA/ SSSI. No significant residual effects on statutory designated sites are therefore predicted at the construction phase of the Development.

Non-statutory Designated Sites

6.279 The impact assessment has concluded that the Development will result in negligible effects on West Knapton Road Verge, Sandy Lane Fields, Scampston Fish Ponds and Wilton Heights Quarry SINCs. No significant residual effects on non-statutory designated sites are therefore predicted at the construction phase of the Development.

Habitats

6.280 Residual effects on habitats are assessed to be negligible.

Breeding Birds

6.281 With the implementation of appropriate mitigation to ensure that vegetation clearance is undertaken outside the breeding bird season, residual effects on breeding birds are assessed to be negligible.

Badger

6.282 See Confidential Badger Appendix (Appendix 6.6).

Bats

6.283 No significant adverse effects on bats are predicted and the residual effects are assessed as negligible.

Reptiles

6.284 Mitigation for reptiles including the capture and translocation of reptiles away from affected habitats will prevent the accidental/ killing injury of reptiles during vegetation clearance operations in the forestry plantation, and associated with ditches. It is assessed that the mitigation will reduce the risk of the impact occurring, and as such the residual effect on reptiles is assessed to be negligible.

Operation

6.285 There is no potential for significant residual effects on protected species during the operational phase of the Development.

Decommissioning and Restoration

6.286 There is no potential for significant residual effects on protected species during the decommissioning and restoration phases of the Development.

Cumulative Effects

6.287 Potential cumulative effects have been assessed in respect of other proposed or permitted schemes in the vicinity, acting together to generate elevated levels of effects from those reported above. Two projects have been scoped into the cumulative assessment; the Ebberston Moor Early Development Scheme (EDS) (Planning Reference Number: NYM/2013/0477/EIA) and the York Potash Project (application not submitted to date).

Ebberston Moor EDS

6.288 Ebberston Moor EDS 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; and
- 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.

6.289 There is therefore the potential for cumulative effects to occur, since the Ebberston Moor EDS is proposed to be constructed and operational prior to the construction of the Development.

6.290 The Ebberston Moor EDS Environmental Statement[xxxix] has not identified any impacts on hydrology as a result of the construction and decommissioning phases, and subsequently concluded that there will be no significant effects on Troutsdale and Rosekirk Dale Fens SSSI, since all water disposal will be via a closed system. There is therefore no potential for cumulative effects on the SSSI as a result of the Development.

6.291 The ES concludes that there will be no significant effects on any protected species, including nesting nightjar which is known to be present in the clear felled habitat at Jingleby Thorn, which is approximately 1.2 km north of the Development. There is therefore no potential for cumulative effects to occur during the operational phase of the Ebberston Moor EDS and the construction phase of the Development.

6.292 There is no potential for cumulative effects on Eller's Wood and Sand Dale SAC/ SSSI, Nabgate SSSI and the River Derwent SAC, since there is no pathway for impacts on these sites associated with the Ebberston Moor EDS, given the distances between the Ebberston Moor EDS and the designated sites. No adverse effects on the North York Moors SAC/ SPA/ SSSI have been identified as a result of the construction or operation of the Ebberston Moor EDS, and therefore there is no potential for cumulative effects on the designated sites.

York Potash Project

6.293 The York Potash Project is a nationally important proposal to develop a new potash mine in the area between Whitby and Scarborough. In addition to the construction of a new mine, the Project includes the construction of a c. 37 km underground Mineral Transport System (MTS), which is an underground conveyor belt system constructed in a tunnel with a depth of approximately 250 m. A Materials Handling Facility is also proposed at Teesside to process and export the extracted material from a new harbour facility at Redcar on the south bank of the River Tees. Separate planning applications will be submitted for the potash mine, MTS pipeline and harbour facility.

6.294 The potash mine site will be constructed at a site approximately 5 km south of Whitby, North Yorkshire, and is in close proximity to the North York Moors SPA. Given that the construction of the mine will involve noise and visual disturbance due to the blasting of shafts and the construction of temporary above-ground winding head frames and other plant, there is the potential for noise and visual disturbance to birds using the nearby North York Moors SPA.

6.295 The Development alone has been concluded to result in no adverse effects on birds associated with the North York Moors SPA, given that the distance between the Development and the SPA would negate the potential for any displacement effects due to noise or visual disturbance. The York Potash Project mine site is closer to the SPA (c. < 50m) and therefore there is greater potential for adverse effects due to noise and visual disturbance. However, any displacement to SPA birds caused by the construction phase of the potash mine would be likely to be limited in spatial extent and would be temporary for the duration of the noisiest construction activities (one blast is anticipated per day per shaft). Visual effects would also be temporary for the construction phase, and would be mitigated by the screening effect of the surrounding forestry plantation that buffers the mine site from the surrounding farmland that may be used by SPA birds. Although no detailed impact assessment of the York Potash Project has been published to date, based on the available construction information and as the potash mine site is c. 17 km north of the Development, it is reasonable to assume that there will be no cumulative effects on birds associated with the North York Moors SPA as a result of noise and visual disturbance, should the construction phases of the Development and the potash mine progress at the same time.

6.296 Once completed, the majority of the operational facilities of the potash mine are below-ground, with only office and welfare buildings present on the site during the operation phase. No visual or noise disturbance is anticipated during the operational phase of the mine site and therefore there is no potential for cumulative effects with the Development, which likewise does not predict any operational effects on the North York Moors SPA when considered in isolation.

6.297 The MTS pipeline crosses part of the North York Moors SPA, but as it will be constructed below ground, potential construction impacts on habitats will only be associated with the three intermediate access points (consisting of a shaft to the tunnel below). None of these are within the SPA boundary, and as considered above in respect of the potash mine, any indirect visual/ noise impacts would be expected to be limited. The intermediate access points are also substantially further north of the Development than the mine site, and it is reasonable to conclude that there is no potential for cumulative effects on the SPA bird assemblage.

6.298 No operational impacts on the SPA bird assemblages are predicted given that the MTS is entirely beneath the ground. No cumulative operational effects on SPA birds are therefore predicted.

6.299 It is assumed that best practice will be adopted for the York Potash Project to ensure that the mitigation hierarchy is followed in respect of other protected species that may be identified as potentially affected i.e. in the first instance, impacts will be avoided at the design phase, mitigated where appropriate or compensated in the worst-case scenario. As such, it is reasonable to assume that given the distance between the York Potash Project and the Development, there is no potential for cumulative effects on any other nature conservation receptors. The cumulative effects are therefore negligible.

Summary

6.300 The Development will not result in any loss of protected habitats, and will not result in any significant adverse effects on statutory designated sites including Eller's Wood and Sand Dale SAC/ SSSI, Nabgate SSSI, North York Moors SPA/ SAC/ SSSI, Troutsdale and Rosekirk Dale Fens SSSI and the River Derwent SAC. Likewise, no adverse effects on locally designated SINC sites have been identified.

6.301 Habitats within the study area support a range of protected species. The forestry plantation in which the Site lies is known to support Schedule 1 nesting bird species goshawk and nightjar. However, the assessment has concluded that there is no potential for significant effects on these species. Sensitive timing of vegetation clearance is necessary to ensure legislative compliance in respect of nesting bird species.

6.302 The desk-study indicates that reptiles are relatively widespread throughout the forestry plantation, and mitigation to address the potential adverse effects on this species will be undertaken prior to the commencement of excavation works.

6.303 The River Derwent, which will be crossed by the Development, is known to support otter, water vole and white-clawed crayfish. However, the River Derwent will be crossed using a non-open cut directional drilling or a suitable alternative installation technique and there is therefore no potential for the Development to impact these species.

6.304 The potential for water vole to be present on other ditches within the southern part of the Site has also been identified, and these ditches require updated surveys immediately prior to the commencement of construction to enable the risks to be fully identified. If present, mitigation to address adverse effects on this species will be undertaken.

6.305 No significant residual effects on terrestrial ecological receptors have been identified during the construction, operational, decommissioning and restoration phases of the Development. Likewise, no cumulative effects have been identified.

6.306 The majority of the impacts associated with the Development are temporary in spatial and temporal extent. As all habitats will be reinstated post-construction, there is no potential for significant residual effects on protected species during the operational phase of the Development.

6.307 No potential cumulative effects have been identified with other plans or projects.

6.308 Table 6.15 provides a summary of the likely significant effects of the Development.

Table 6.15: Table of Significance – Ecology

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/ Minor) (Beneficial/Adverse/ Negligible)
				I	UK	E	R	C	D / N P	L	
Construction											
Displacement/ disturbance to birds in the North York Moors SPA/ SSSI	Short term temporary	Negligible	No mitigation proposed	*							Negligible
Changes in water quality resulting in effects on Troutsdale & Rosekirk Dale Fens SSSI	Short term temporary	Negligible	No mitigation proposed		*						Negligible
Loss of habitat including forestry plantation	Short term temporary	Negligible	No mitigation proposed. Woodland to be re-planted upon completion of drilling works. Appropriate RPAs established around retained trees in close proximity to route.							*	Negligible
Damage to habitat as a result of dust deposition	Short term temporary	Negligible	Standard dust suppression measures during construction phase							*	Negligible
Loss of breeding bird habitat	Short term temporary	Minor Adverse	No mitigation proposed. Sensitive timing of vegetation clearance to ensure legislative compliance. Woodland to be re-planted upon completion of works.							*	Minor Adverse
Noise/ visual disturbance to breeding goshawk	Short term temporary	Negligible	Liaison with Forestry Commission to check whether any goshawk nests have become established within 400 m zone from Development site							*	Negligible
Noise/ visual disturbance to breeding nightjar	Short term temporary	Negligible	No mitigation proposed. Sensitive timing of vegetation clearance to ensure legislative compliance. Woodland to be re-planted upon completion of drilling works.							*	Negligible
Loss of habitat used by foraging/ commuting bats	Short term temporary	Negligible	No mitigation proposed. Habitat to be re-planted where possible							*	Negligible

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/ Minor) (Beneficial/Adverse/ Negligible)
				I	UK	E	R	C	D / N P	L	
			(including hedgerows) upon completion of works								
Lighting disturbance to foraging/ commuting bats at EMS Well Site	Short term temporary	Negligible	Task lighting designed to be downward directional to minimise light spillage outside site boundary							*	Negligible
Loss/ damage to habitat supporting reptiles	Short term temporary	Moderate Adverse	Temporary exclusion fencing and capture period to ensure no reptiles in working area. Sensitive clearance of vegetation, watching brief by ecologist where necessary							*	Negligible
Loss/ damage to habitat supporting water voles	Short term temporary	Moderate Adverse	Vegetation strimming and/ or destructive searches to displace water voles from crossing point so there is no risk of killing/ injury. Supervision of works and monitoring throughout construction period.					*			Negligible
Loss of habitat supporting brown hare	Short term temporary	Negligible	No mitigation proposed.							*	Negligible
Operation											
Changes in water quality resulting in effects on Troutsdale & Rosekirk Dale Fens SSSI	Long term temporary	Negligible	No mitigation proposed		*						Negligible
Noise/ visual disturbance to birds in the North York Moors SPA/ SSSI	Long term temporary	Negligible	No mitigation proposed	*							Negligible
Changes in air quality resulting in effects on habitats	Long term temporary	Negligible	No mitigation proposed							*	Negligible
Changes in water quality resulting in effects on habitats	Long term temporary	Negligible	No mitigation proposed							*	Negligible
Noise and visual disturbance to breeding goshawk	Long term temporary	Negligible	No mitigation proposed							*	Negligible

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/ Minor) (Beneficial/Adverse/ Negligible)
				I	UK	E	R	C	D / NP	L	
Noise and visual disturbance to breeding nightjar	Long term temporary	Negligible	No mitigation proposed							*	Negligible
Lighting disturbance to foraging or commuting bats at EMS Well Site	Long term temporary	Negligible	Task lighting designed to be downward directional to minimise light spillage outside site boundary							*	Negligible
Decommissioning and Restoration											
Changes in air quality resulting in effects on Troutsdale & Rosekirk Dale Fens SSSI	Short term temporary	Negligible	No mitigation proposed		*						Negligible
Noise/ visual disturbance to birds in the North York Moors SPA/ SSSI	Short term temporary	Negligible	No mitigation proposed	*							Negligible
Noise/ visual disturbance to breeding goshawk	Short term temporary	Negligible	No mitigation proposed							*	Negligible
Noise/ visual disturbance to breeding nightjar	Short term temporary	Negligible	No mitigation proposed							*	Negligible
Increased habitat availability for foraging/ commuting bats	Short term temporary	Minor Beneficial	No mitigation proposed							*	Minor Beneficial
Cumulative Effects											
None identified	Negligible	N/A	N/A								Negligible

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; D = District; NP = National Park; L = Local

i The Wildlife and Countryside Act 1981 (as amended)
ii Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)
iii Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive)
iv Wildlife and Countryside (Service of Notices) Act 1985
v Conservation of Habitats and Species Regulations 2010 (as amended)
vi Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive)
vii Natural Environment and Rural Communities (NERC) Act 2006

viii Department of Communities and Local Government (March 2012) National Planning Policy Framework
ix Department of Communities and Local Government (August 2005) Planning Policy Statement 9 Biodiversity and Geological Conservation
x Planning Practice Guidance: www.planningguidance.planningportal.gov.uk
xi North Yorkshire County Council (1997) North Yorkshire County Council Minerals Local Plan Saved Policies
xii North Yorkshire County Council (March 2012) North Yorkshire County Council Minerals Core Strategy
xiii North York Moors National Park Authority (2008) North York Moors National Park Adopted Core Strategy and Development Policies
xiv North York Moors National Park Authority (June 2012) North York Moors National Park Management Plan
xv Ryedale District Council (March 2002) Ryedale Local Plan
xvi Ryedale District Council (May 2012) The Ryedale Plan – Local Plan Strategy (Submission Document)
xvii Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment
xviii Treweek (1999) Ecological Impact Assessment
xix Institute of Ecology and Environmental Management (IEEM) (June 2010) *Guidelines for Ecological Impact Assessment in the United Kingdom*
xx Joint Nature Conservation Committee (2010) *Handbook for Phase 1 Habitat Survey – A technique for Environmental Audit*
xxi NERC Section 41 Habitats and Species of Principal Importance
xxii Strachan, R., Moorhouse, T. and Gelling, M. (2011) *Water Vole Conservation Handbook* (Third Edition)
xxiii Gent, T. And Gibson, S. (2012) *Herpetofauna Workers Manual*
xxiv Harris, Cresswell and Jefferies (1989) *Surveying Badgers*
xxv Bat Conservation Trust (2012) *Bat Surveys Good Practice Guidelines*
xxvi Bat Conservation Trust (2012) *Bat Surveys Good Practice Guidelines*
xxvii Radcliffe (1977) *The Ratcliffe Criteria*
xxviii Stace (2010) *Stace's New Flora of the British Isles*
xxix Hedgerow Regulations 1997
xxx Petty (1996) *History of Northern Goshawk* Accipiter gentilis *in Britain*
xxxi Scott, Graham W., Jardine David C., Hills, Gillian and Sweeney, Brian (1998) *Nightjar* Caprimulgus europaeus *populations in upland forests in Yorkshire*. Bird Study 45: 219-225
xxxii Conway, G. and Henderson, I (2005) *A continuation survey of Nightjars* Caprimulgus europeaus
on SSSIs in East Anglia
xxxiii Birdguides (2006)
xxxiv Environment Agency (2012) *The fifth otter survey of England 2009 - 2012*
xxxv Environment Agency (2001) *Eradication of alien crayfish populations – R&D Technical Report* W1-037/TRI
xxxvi Ruddock and Whitfield (2007) *A Review in Disturbance Distances in Selected Bird Species*
xxxvii Ruddock and Whitfield (2007) *A Review in Disturbance Distances in Selected Bird Species*
xxxviii Ruddock and Whitfield (2007) *A Review in Disturbance Distances in Selected Bird Species*
xxxix Barton Willmore (2013) Ebberston Moor Early Development Scheme (EDS) Environmental Statement