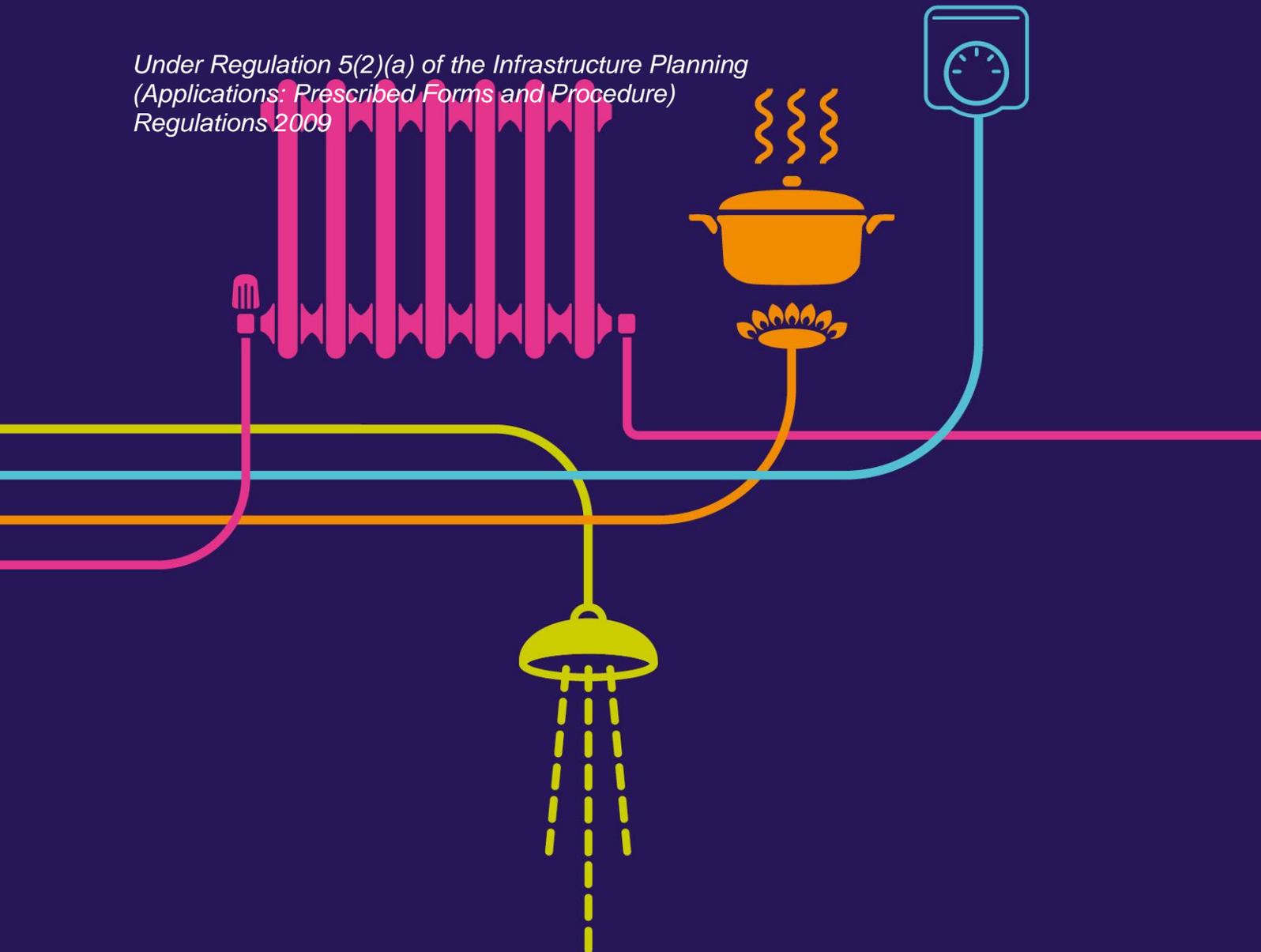


EIA Methodology and Construction Environmental Management

River Humber Gas Pipeline Replacement Project

*Under Regulation 5(2)(a) of the Infrastructure Planning
(Applications: Prescribed Forms and Procedure)
Regulations 2009*





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DCO Document Reference	Title of Document
6.16	Screening Opinions
6.17	Scoping Opinion Received from PINS
6.19	Non-Technical Summary
7.2	Transport Assessment
7.2.1	Initial Traffic Management Plan
7.3	Initial Construction Environmental Management Plan

Abbreviations

AGI	Above Ground Installation
CEMP	Construction Environmental Management Plan
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
EEA	European Economic Area
EIA	Environmental Impact Assessment
ES	Environmental Statement
FRA	Flood Risk Assessment
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
MAGIC	Multi Agency Geographic Information for the Countryside
NO ₂	Nitrogen Dioxide
NSIP	Nationally Significant Infrastructure Project
PEIR	Preliminary Environmental Information Report
PEMP	Project Environmental Management Plan
PINS	Planning Inspectorate
PM ₁₀	Particulate Matter
SIAA	Statement to Inform an Appropriate Assessment
TBM	Tunnel Boring Machine

4 THE ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY AND CONSTRUCTION ENVIRONMENTAL MANAGEMENT

4.1 Introduction

4.1.1 This chapter sets out the general approach that has been followed in undertaking the Environmental Impact Assessment (EIA) of the Scheme. It summarises the key stages that have been followed in line with statutory requirements and Planning Inspectorate (PINS) advice notes. It also outlines how construction environmental management would be undertaken and the mechanisms that would be used throughout the Scheme's construction.

4.2 Purpose and Objectives of Environmental Impact Assessment

4.2.1 EIA is the process of compiling, evaluating and presenting environmental information in support of an assessment of all likely significant effects of a proposed development. The assessment is designed to inform the development of the Scheme and to provide decision makers and statutory consultees with the environmental information they require during the determination of an application for consent. The process allows mitigation measures to be identified to avoid, reduce or offset significant environmental effects and be incorporated into the design of the Scheme and commitments made to ensure environmentally sensitive construction methods and practices.

4.2.2 The collation of environmental information and analysis of this information against the Scheme has continued throughout the Scheme's development and is recorded in this Environmental Statement (ES).

4.2.3 The objectives of the EIA are summarised as follows:

- To describe the main alternatives studied and provide an indication of the main reasons for choice, taking into account the environmental effects;
- To establish and describe the existing and future environmental conditions of the application site and surrounding area;
- To identify and evaluate environmental design and enhancement measures to prevent, reduce and, where possible offset adverse effects;
- To identify both positive and negative likely significant residual effects that may arise from the construction and operation of the Scheme, taking account of its size and location, the sensitivity of the local environment, the concerns of interested parties and the requirements of statutory consultees;

- To predict and evaluate the extent and significance of the likely residual effects; and
- To predict and evaluate the extent and significance of the likely residual cumulative effects.

4.3 The EIA Regulations and Guidance

EIA Regulations

- 4.3.1 The Infrastructure Planning (EIA) Regulations 2009 as amended (the EIA Regulations) implement in relation to Nationally Significant Infrastructure Projects (NSIPs), Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive). These regulations have been followed throughout the preparation of this EIA.
- 4.3.2 Schedule 4 of the EIA Regulations highlights the information to be included within an ES. Part 1 highlights information ‘as is reasonably required’ and Part 2 details information that must be provided as a minimum. This information is provided in Table 4-1, which also indicates where information is provided within this ES.

Table 4-1 EIA Methodology - Requirements of Part 1 and Part 2 of Schedule 4 of the EIA Regulations and Details of their Location within this ES

Requirements	Location within the ES
Part 1	
Description of the development, including in particular— (a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases; (b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; (c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.	Chapter 2 (Development Consent Order (DCO) Document Reference 6.2)
An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant’s choice, taking into account the environmental effects.	Chapter 3 (DCO Document Reference 6.3)
A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.	Chapters 5-14 (DCO Document Reference 6.5 to 6.14)
A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long term,	Chapters 5-14

Requirements	Location within the ES
permanent and temporary, positive and negative effects of the development, resulting from: (a) the existence of the development; (b) the use of natural resources; (c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.	(DCO Document Reference 6.5 to 6.14)
A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	Chapters 5-14 (DCO Document Reference 6.5 to 6.14)
A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Provided in a separate document (DCO Document Reference 6.19)
An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Chapters 5-14 (DCO Document Reference 6.5 to 6.14)
Part 2	
A description of the development comprising information on the site, design and size of the development.	Chapter 2 (DCO Document Reference 6.2)
A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.	Chapters 5-14 (DCO Document Reference 6.5 to 6.14)
The data required to identify and assess the main effects which the development is likely to have on the environment.	Chapters 5-14 (DCO Document Reference 6.5 to 6.14)
An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.	Chapter 3: (DCO Document Reference 6.3)
A non-technical summary.	Submitted as a standalone document. (DCO Document Reference 6.19)

EIA Guidance

- 4.3.3 A range of guidance has been developed to inform the EIA process and the preparation of the ES. The guidance used in the technical assessments (Chapters 5 to 14, DCO Document References 6.6 to 6.15) are detailed within individual chapters as appropriate.
- 4.3.4 PINS has published a number of Advice Notes to help guide applicants through the application process. PINS Advice Notes directly relevant to the EIA are:
- Advice Note Three: EIA consultation and notification (July 2013);
 - Advice Note Six: Preparation and submission of application documents (October 2014);
 - Advice Note Seven: EIA, screening and scoping (July 2013);
 - Advice Note Nine: Rochdale Envelope (April 2012);
 - Advice Note Eleven: Working with public bodies in the infrastructure planning process (April 2012);
 - Advice Note Twelve: Development with significant Transboundary Impacts Consultation (April, 2012)
 - Advice Note Fifteen: Drafting Development Consent Orders (October 2014); and
 - Advice Note Sixteen: The Developer's Pre-application Consultation, Publicity and Notification Duties (April 2012).

4.4 Stages in the EIA Process and their Application to this Scheme

- 4.4.1 The following sections outline the stages in the EIA process and how they have been applied to this Scheme.

Screening

- 4.4.2 Under Section 20 of the Planning Act 2008, construction of a gas transporter pipeline is an NSIP if:

(1) *"The construction of a pipe-line by a gas transporter is within section 14(1) (f) only if (when constructed) each of the conditions in subsections (2) to (5) is expected to be met in relation to the pipe-line.*

(2) *The pipe-line must be wholly or partly in England.*

(3) *Either –*

(a) The pipe-line must be more than 800 millimetres in diameter and more than 40 kilometres in length, or

(b) The construction of the pipe-line must be likely to have a significant effect on the environment.

(4) The pipe-line must have a design operating pressure of more than 7Bar gauge.

(5) The pipe-line must convey gas for supply (directly or indirectly) to at least 50,000 customers, or potential customers, of one or more gas suppliers.”

4.4.3 In relation to the above, criteria 1, 2, 4 and 5 are met. Criterion 3 (a) is not met by the Scheme and, therefore, the determining factor whether the project is deemed an NSIP is whether the pipeline is likely to have a significant effect on the environment.

4.4.4 In accordance with Regulation 6(1) (a) of EIA Regulations, National Grid Gas submitted a request to the Secretary of State – via the National Infrastructure Directorate of PINS – to adopt a Screening Opinion as to whether the Scheme would be likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

4.4.5 A parallel environmental determination was sought from the Secretary of State via the Department of Energy and Climate Change (DECC) under Regulation 6 of the Public Gas Transporter Pipeline Works (EIA) Regulations 1999. This was required owing to a duplication in the regulations covering gas transporter pipelines. Whilst the government announced an intention to remove this duplication, both sets of regulations applied at the time of the EIA Screening exercise (note both sets of regulations continue to apply at the time of publication of this ES).

4.4.6 In accordance with Regulation 7 (1) of the EIA Regulations, the Secretary of State provided the opinion on 1 April 2014 that the Scheme constitutes EIA development and is likely to have significant effects on the environment by virtue of the characteristics of the development, the location of the development and the characteristics of the potential impact for the reasons listed below (refer also to the PINS Screening Opinion, DCO Document Reference 6.16):

- Impacts on the Humber Estuary Special Area of Conservation, Special Protection Area, Site of Special Scientific Interest and Ramsar site;
- Impacts on nature conservation species due to disturbance from noise and lighting;
- Landscape and visual impacts as a result of the presence of silos and construction activity; and
- Cumulative impacts with other projects in the area.

4.4.7 The environmental determination provided by DECC on 8 May 2014 also stated that it could not be ruled out that the Scheme constitutes EIA development although the determination did acknowledge that any significant effects would be limited in scope (refer to the DECC Environmental Determination, DCO Document Reference 6.16).

4.4.8 Therefore National Grid Gas has prepared an ES in accordance with the requirements of the EIA Regulations.

Scoping

4.4.9 In accordance with Regulation 8(1) of the EIA Regulations on 14 May 2014, National Grid Gas requested PINS provide its opinion on the scope of the information to be included in the ES for the Scheme. To inform the PINS Scoping Opinion an EIA Scoping Report was submitted by National Grid Gas clearly outlining the intended scope of each environmental topic. The EIA Scoping Report was submitted to PINS in May 2014 with the PINS Scoping Opinion received in June 2014 (DCO Document Reference 6.17). This ES has been prepared in accordance with the advice set out in the Scoping Opinion, the associated consultation responses, and the EIA Regulations.

4.4.10 Appendix 4.1 (DCO Document Reference 6.4.1) summarises the scoping responses received and indicates how they have been considered within the ES. This demonstrates that the ES has considered the requests and comments raised through the scoping consultation, where applicable.

4.4.11 The scope and contents of the ES have been informed by the Scoping Opinion. Table 4-2 presents a summary of the environmental topics / issues that have been 'scoped out' of the ES, with an accompanying justification. Further detail is provided in the EIA Scoping Report.

Table 4-2 EIA Methodology - Environmental Topics / Issues Scoped out of the ES

Environmental Topic / Issue	Organisation	Reason/Justification
Air Quality / construction traffic emissions	PINS	The existing NO ₂ and PM ₁₀ levels are sufficiently below the annual NO ₂ air quality objective of 40µg/m ³ and the annual PM ₁₀ air quality objective of 40µg/m ³ . In consideration of this, and that the estimated daily traffic movement is less than 200 heavy goods vehicle movements per day which is the threshold under UK Environmental Protection guidance for undertaking a detailed assessment, it is unlikely that construction emissions would cause the air quality objectives to be exceeded. Therefore air quality impacts arising from construction traffic emissions have been scoped out.
Air Quality / operational impacts	PINS	Following construction there would be no additional emissions above the existing baseline as the Scheme comprises the replacement of an existing facility - only maintenance traffic would be using the sites following construction. Therefore operational air quality has been scoped out.
Cultural Heritage / Setting on Thornton Abbey	PINS	Due to the distance (5km from the Scheme) and orientation of Thornton Abbey, together with the intervention of vegetation it is unlikely that the Scheme

Environmental Topic / Issue	Organisation	Reason/Justification
		would form a perceptible element. Therefore the visual effects resulting from construction impacts on the setting of Thornton Abbey have been scoped out.
Cultural Heritage / operational impacts	PINS	Operational impacts on cultural heritage are unlikely given the nature of the development i.e. a buried pipeline, tunnel, aerial markers and small kiosks (at Paull and Goxhill – for cathodic protection and the monitoring the decommissioned, Existing No 09 Crossing). Therefore operational impacts on cultural heritage have been scoped out.
Cultural Heritage / construction impacts on marine archaeology	PINS	The gas pipeline would be within a tunnel at least 6m below the river bed and therefore no mitigation is required relating to marine archaeology. This was discussed and agreed with the Humber Archaeology Partnership, North Lincolnshire Historic Environment Record Officer and English Heritage. Therefore construction impacts on marine archaeology have been scoped out.
Ecology and Nature Conservation / operational impacts	PINS	The pipeline would be buried and there would be very limited remaining infrastructure and as such operational impacts are unlikely. Lighting would be temporary during construction and the only operational noise would be routine maintenance that is already undertaken at the Above Ground Installations (AGIs).
Ecology and Nature Conservation	PINS / Natural England	Agreed that great crested newt surveys are not required. However, note that Habitat Suitability Index surveys have informed this decision.
Geology and Soils / operational impacts	PINS	Operational impacts are unlikely given the nature of the development i.e. a buried pipeline and minimal above ground infrastructure, therefore operation impacts on geology and soils have been scoped out.
Landscape and Visual Amenity / Effects on National Landscape Character	PINS	Effects on national landscape character have been scoped out of the ES as effects on landscape character are most appropriately identified at the local level.
Landscape and Visual Amenity / views from Thornton Abbey	PINS	There would be no effects due to a combination of the relative remoteness between the Abbey and the Scheme within a low lying flat landscape and the intervening nature of landscape features such as tree lines. Therefore due to the distance from and nature of

Environmental Topic / Issue	Organisation	Reason/Justification
		the Scheme an assessment of views from Thornton Abbey has been scoped out.
Noise and Vibration / operational impacts	PINS	There would be no operational noise or vibration impacts as the only activities undertaken would be routine maintenance that is already undertaken at the AGIs. Therefore operational noise has been scoped out.
Socio-economics and Land Use / operational impacts	PINS	The assessment only covers the construction phase as operational impacts to settlements and population, local economy, Public Rights of Way, land use and agriculture, and tourism are all unlikely given the nature of the development i.e. a buried gas pipeline with minimal above ground infrastructure. As such the operational socio-economic impacts have been scoped out.

Preliminary Environmental Information Report

- 4.4.12 Under Section 42 of the Planning Act 2008 there is a requirement to provide consultees with a Preliminary Environmental Information Report (PEIR). The PEIR provides a snap shot of the environmental information available at the time of consultation. The type of information required is the same as that required under Schedule 4 of the EIA Regulations, albeit more limited as the information is ‘preliminary’ at the time of drafting. The purpose of providing the PEIR is to ensure those responding to the consultation are aware of the preliminary findings in relation to likely significant environmental issues and effects arising from the Scheme. The PEIR provided a description of the Scheme, outlined alternatives and presented a preliminary review of the likely environmental effects and how they could be mitigated.
- 4.4.13 The PEIR was consulted upon between September and October 2014 in accordance with Sections 42 and 47 of the Planning Act 2008.
- 4.4.14 Appendix 4.2 (DCO Document Reference 6.4.2) summarises the Section 42 consultation responses received and indicates how they have been considered within the ES, in order to demonstrate that the ES has considered the requests and comments raised through the consultation, where applicable.

Environmental Statement

- 4.4.15 This ES reports the EIA process and the significant effects of the Scheme by environmental topic. The approach to preparing the ES is outlined in Section 4.5 below.

4.5 Approach to the Environmental Statement

Environmental Statement Chapter Topics

4.5.1 The following environmental topics are included within this ES:

- Air quality;
- Cultural heritage;
- Ecology and nature conservation;
- Geology and soils;
- Landscape and visual amenity;
- Noise and vibration;
- Socio-economics and land use;
- Traffic and transport;
- Water resources (including hydrogeology); and
- Cumulative effects.

4.5.2 The production of waste likely to be generated by the Scheme is described in the Chapter 2: Scheme Description and then assessed as appropriate within each of the above topic chapters.

Structure of Each Environmental Topic Chapter

4.5.3 For each environmental topic the following is reported:

- Summary of relevant legislation / planning policy;
- Methodology (including definition of study area);
- Existing baseline information;
- Future baseline information;
- Receptors potentially affected;
- Environmental design measures;
- Residual effects;
- Difficulties encountered in compiling the ES; and
- Summary.

Summary of Relevant Legislation / Planning Policy

4.5.4 Each assessment has been undertaken in accordance with current legislation along with national, regional and local plans and policies. A summary of the relevant policy framework is provided at the beginning of each environmental chapter. In addition a separate summary of how the assessment complies with the requirements outlined in relevant sections of National Policy Statements EN-1 'Overarching National Policy Statement for Energy' (2011) and EN-4 'National

Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines' (2011) is also provided.

Methodology (including Establishing Study Areas)

4.5.5 Each environmental chapter includes a methodology section which outlines the approach taken to undertake the assessment.

4.5.6 Specific study areas are also defined for each environmental topic within the methodology section, to ensure that significant effects are identified and assessed in accordance with relevant standards and guidance for that topic. As a result, study areas are different for each topic, as the geographic extent of predicted direct and indirect impacts differs in each case. In some instances more than one study area is defined for a single environmental topic, in accordance with relevant standards and guidance for that topic.

Establishing Baseline Information

4.5.7 In order to evaluate likely environmental effects, information relating to the existing environmental conditions has been collected.

4.5.8 Where appropriate for the technical assessments, the methods of data collection have been discussed and agreed with relevant consultees. Data has also been collected from public records and other archive sources and, where appropriate, field surveys have been carried out. Data sources are described in each technical chapter.

4.5.9 Baseline conditions have been assumed to be accurate at the time of the physical surveys but, due to the dynamic nature of the environment, conditions may change during site preparation and construction. There is also a general assumption that information provided by third parties, including publicly-available information and databases used for baseline information, is correct as of time of publication.

4.5.10 In most cases, the baseline is assumed to remain unchanged through the construction of the Scheme. Where this is not the case, this is stated. The baseline is used to assess what changes may take place as a result of the construction and, where relevant, the operational phase of the Scheme.

4.5.11 The collation of baseline data for the environmental assessments has included the following:

- A review of desk-based sources including the Multi Agency Geographic Information for the Countryside (MAGIC), Environment Agency and Local Authority websites;
- Site visits to understand the characteristics of the study area by ecologists, cultural heritage specialists, chartered landscape architects, noise specialists, traffic engineers and EIA specialists;

- Ecological surveys comprising an extended Phase 1, over-wintering, passage and breeding bird, badger, reptile, water vole and aquatic invertebrate;
- Baseline noise surveys;
- Traffic surveys;
- Marine geophysics;
- Archaeological geophysical surveys; and
- Consultation with key organisations including meetings, telephone conversations and data requests (refer to Table 4-3¹).

Table 4-3 EIA Methodology - Meetings Undertaken to Date during the Environmental Impact Assessment Process and to Inform the Baseline

Consultee	Type and Date of Consultation	Information Requested/Issues Discussed
Natural England	Meeting on 15 November 2013	To provide Natural England with an update of the Scheme, to obtain relevant baseline data and to seek opinions on the potential Scheme impacts.
	Meeting on 9 June 2014	To discuss the draft Habitats Regulations Assessment (HRA) Screening Report
	Meeting on 19 November 2014	To discuss the draft Statement to Inform an Appropriate Assessment (SIAA) and agree its conclusions.
Environment Agency	Meeting on 11 November 2013	To provide the Environment Agency with an update of the Scheme, to obtain relevant baseline data and to seek opinions on the potential Scheme impacts as well as options for potential re-use of the waste arisings.
	Meeting on 31 October 2014	To provide the Environment Agency with an update of the Scheme, discuss the hydrogeological risk assessment, dewatering, the findings of the Flood Risk Assessment and the Initial Site Water Management Plan.

¹ Specific consultation is outlined in each chapter, however, Table 4-3 provides a summary of the key meetings that have been attended.

Consultee	Type and Date of Consultation	Information Requested/Issues Discussed
East Riding of Yorkshire Council	Meeting on 17 December 2013	To provide the Council with an update of the Scheme, to obtain relevant baseline data, to seek opinions on the potential Scheme impacts as well as options for potential re-use of the waste arisings, traffic and transport routes to the site and the scope of any archaeological works.
	Meeting on 17 November 2014	To provide the Council with an update of the Scheme as well as traffic and transport route options.
North Lincolnshire Council	Meeting on 17 December 2013	To provide the Council with an update of the Scheme, to obtain relevant baseline data, to seek opinions on the potential Scheme impacts as well as options for potential re-use of the waste arisings, transport routes to the site and the scope of any archaeological works.
	Meeting on 21 October 2014	To provide the Council with an update of the Scheme, details of information required from them and to discuss the Planning Performance Agreement.
	Meeting 26 on November 2014	To provide the Council with an update of the Scheme as well as traffic and transport route options.
English Heritage	Meeting on 9 January 2014	To provide English Heritage with an update of the Scheme, to obtain relevant baseline data and to seek opinions on the potential Scheme impacts.
Marine Management Organisation	Meeting on 27 January 2014	To provide the Marine Management Organisation with an update of the Scheme, to obtain relevant baseline data and to seek opinions on the potential Scheme impacts.

Future Baseline Information

4.5.12 For each of the environmental topics, the existing baseline is projected forward to consider what changes there may be to the baseline conditions by the time construction of the Scheme is underway. This is the future baseline and is outlined in each environmental chapter.

Receptors Potentially Affected

- 4.5.13 Each environmental chapter provides a section that lists potential receptors / features identified in the baseline that could be affected by the Scheme. Each receptor / feature is assigned with a value / sensitivity (where relevant) in line with the approach described within the methodology.
- 4.5.14 This section also outlines which receptors / features have been scoped out of the assessment along with a justification.

Environmental Design Measures

- 4.5.15 Environmental design measures such as the sensitive routing of the tunnel and pipeline have been critical in ensuring environmental effects have been avoided or minimised where possible. The development of the measures are an iterative process of avoidance, reduction, amelioration and compensation. Measures have been identified throughout the design development process and used to inform the Scheme design, such that it has avoided key areas (by changes to route or layout) or included features that would minimise potential effects on specific environmental receptors. Measures have only been proposed where there is a high degree of confidence in their successful implementation and effectiveness and also that they can be delivered. This is reiterated in PINS Advice Note Sixteen which states:

‘Where an application would have a number of adverse impacts that require mitigating, as set out in the accompanying ES, such mitigation measures should generally be secured in draft requirements. Mitigation that is identified in the ES as being required must be capable of being delivered. Examples of such mitigation include: provision of a code of construction practice, provision of a Construction Environmental Management Plan (CEMP) and provision of a Site Waste Management Plan’.

- 4.5.16 Environmental design measures are outlined within each technical chapter (Chapters 5-14, DCO Document Reference 6.5 to 6.14).
- 4.5.17 The environmental design measures have been an integral part of the Scheme design process with a number of measures having been implemented to reduce the Scheme’s adverse environmental effects. Such measures have included:
- Reduction of the Scheme footprint;
 - Avoidance of key features such as designated sites, footpaths, Listed Buildings etc. More specifically:
 - The Humber Estuary Ramsar Site, Special Area of Conservation, Special Protection Area, Site of Special Scientific Interest and Important Bird Area;
 - Paull Holme Strays Wildlife Trust Reserve; and
 - Archaeological remains associated with the river.

- Reduced Scheme construction timescales to minimise the length of disturbance;
- Landscaping, bunding and hoarding to reduce noise and visibility of the Scheme;
- Reduced Scheme lighting to minimise light spill;
- Selected drive and reception pits that reduce the length of the tie-in to each AGI and also the number of road, ditch and pipeline crossings;
- Use of Best Available Techniques Assessment to select Scheme design options, for example the use of onsite generators rather than constructing a new power connection;
- Incorporation of flood mitigation into the design to take account of recent storm surge incidents and the results of the Flood Risk Assessment;
- Application of industry standard construction management measures (these are identified within the topic chapters); and
- Design of Scheme to reduce the number of landowners impacted and to reduce the number of ecological features such as hedgerows that are impacted.

4.5.18 Enhancement measures have been developed in line with the National Planning Policy Framework (where considered appropriate and viable) which would provide beneficial environmental impacts. Enhancement measures lie outside the scope of the EIA Regulations however, measures proposed are outlined in individual environmental chapters. They do not form part of the assessment of residual effects.

4.5.19 Where relevant, details of any monitoring proposed to determine the effectiveness of environmental design / enhancement measures are provided within each environmental chapter.

4.5.20 Environmental design measures have helped to define the Scheme details that have been assessed within the EIA. In each environment topic specific chapter, the 'Residual Effects' section represents an assessment of the Scheme comprising the environmental design measures.

Residual Effects (During Construction, Operation and Decommissioning)

4.5.21 Residual effects of the Scheme are presented in each environmental chapter as those that remain during construction and operation following the successful implementation of the identified environmental design measures.

4.5.22 It should be noted that for most chapters there are no effects following construction and the demobilising of the construction sites i.e. during operation as the site would be restored to its former use.

4.5.23 The asset life is 40 years for the pipeline (the tunnel has a 100 year design life). The actions taken after 40 years of the pipeline's operation would depend upon

the UK's energy mix at the time which is currently uncertain. Two options have been considered:

- Undertake a re-life operation and extend the life of the pipeline; and
- Decommission the pipeline in situ. The pipeline would be isolated from the Goxhill and Paull AGIs by means of a stopple pit installation that would allow the ends of the pipeline to be cut and capped. All works would be undertaken within or immediately adjacent to the AGIs at Goxhill and Paull.

4.5.24 Re-life operation is the preferred and most likely option. This would require confirmation of the integrity of the pipeline and would comprise the following as a minimum:

- Inspection data review;
- Maintenance data and reading review; and
- Confirmation of pressure cycles not being exceeded.

4.5.25 If all the data presents a case to state that the pipeline is still fit for service at this point, it would be re-certified and would continue operation for a number of years. Further extensions of life would follow the same process. Works associated with the extension of life would be undertaken within or immediately adjacent to the existing AGIs.

4.5.26 Given the scale and nature of these works (for either option) any environmental effects would be negligible and controlled through appropriate working practices which may include consents and agreements with the local authorities in accordance with the DCO requirements and prevailing conditions at the time, noting that such works would be a minimum of 40 years post commissioning of the Scheme. These works and the controls are not anticipated to result in any significant effects, the rationale for which is outlined below.

- Air Quality – vehicle movements would be very limited, the works very contained and commensurate with maintenance activities and would not be significant;
- Cultural Heritage – all areas affected would already have been assessed, appropriately mitigated and ultimately disturbed during construction and therefore not significant;
- Ecology and Nature Conservation – works would be very contained and in advance of the works being undertaken an ecological walkover survey would be undertaken to ensure understanding of any constraints in the future and appropriate mitigation. The areas that would be affected are very limited, are close to the existing AGIs and appropriate controls would be implemented. Based on current information for this assessment, effects would not be significant;
- Geology and Soils – all areas affected would already have been assessed, appropriately mitigated and ultimately disturbed during construction and therefore not significant;

- Landscape and Visual Amenity – works would be of a small scale and adjacent to the existing AGIs, highly localised and no more intrusive than regular maintenance activities. All affected areas would be appropriately reinstated and effects would not be significant;
- Noise and Vibration – there would be increased noise levels associated with the activities which would be controlled in line with the mitigation measures proposed for the construction works and employed for maintenance activities. Effects would be of a short duration and not significant;
- Socio-Economics and Land Use – there would be no significant impacts as works would be small scale and of a short duration. All affected areas would be appropriately reinstated;
- Traffic and Transport – Vehicle movements would be minor and of a short duration and not significant; and
- Water Resources (including hydrogeology) – works would be small scale, there would be a requirement for good site practices in accordance with standard National Grid Gas procedure and effects would not be significant.

4.5.27 In addition to the above, all commitments within the DCO, for example agreeing a scheme of decommissioning with the relevant local authorities would be adhered to and all works completed in accordance with National Grid Gas policies and environmental management procedures prevailing at the time.

Assessing Significance

4.5.28 Part of the EIA process is to identify likely significant environmental effects. Therefore the determination of the significance of the residual effects arising from the Scheme is an important stage in the EIA process.

4.5.29 There is no statutory definition of what constitutes a 'significant effect' within the EIA Regulations. However, generally, significance of effects is determined through combining the value (the term 'sensitivity' is used within the Landscape and Visual Amenity assessment) (environmental value / sensitivity may be determined by a multitude of factors; for instance: status of rare or endangered species) of a resource or receptor with the magnitude of the predicted impact (i.e. duration, spatial extent and frequency of the effect) to derive a significance of effect score. Significance is sometimes determined on the basis of expert judgement applied to qualitative or quantitative information. However, for certain environmental effects significance is determined with reference to the predicted level of effects set against accepted levels of exposure, for example noise effects on residential properties.

4.5.30 Table 4-4 demonstrates how combining the environmental value of the resource or receptor with the magnitude of change can produce a 'significance of effect' category. The significance of effect can be either adverse or beneficial.

Table 4-4 EIA Methodology - Arriving at the Significance of Effect Category (Source: DMRB, 2008)

Magnitude of Change	Value / Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Major	Very Large	Large / Very Large	Moderate / Large	Moderate	Slight
Moderate	Large / Very Large	Moderate / Large	Moderate	Slight	Neutral
Minor	Moderate / Large	Moderate	Slight	Neutral	Neutral
Negligible	Slight	Slight	Neutral	Neutral	Neutral
No Change	Neutral	Neutral	Neutral	Neutral	Neutral

4.5.31 A detailed explanation of the specific criteria used for the assessment of each individual topic is set out in the Methodology section of each chapter. Significance criteria within the environmental topics is based on best available guidance for each topic i.e. topic specific guidelines published by government departments or professional institutions or on professional judgement. Where there are significance category options, professional judgement is used to derive a single score.

Difficulties encountered in compiling the ES

4.5.32 This section is provided in each environmental topic chapter and outlines any difficulties that were encountered when specialists were compiling their chapters and how this has affected their assessment.

Summary

4.5.33 Each environmental topic chapter provides a summary that focusses on key receptors, environmental design and enhancement measures as well as residual effects.

Cumulative Effects

4.5.34 Chapter 14: Cumulative Effects (DCO Document Reference 6.14) provides a separate detailed assessment of both inter-project and intra-project cumulative effects. The paragraphs below provide further detail of the two types of cumulative effects assessed.

Inter – Project Cumulative Effects

4.5.35 The EIA Regulations require an assessment of direct, indirect and cumulative effects with other projects and plans. In line with PINS Advice Note Nine the cumulative effects assessment has considered the following:

- Projects under construction;

- Permitted application(s) not yet implemented;
- Submitted application(s) not yet determined;
- Projects on the Planning Inspectorate's Programme of Projects;
- Projects identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and
- Development identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

4.5.36 Where available, the latest environmental information for these projects has been reviewed to inform the cumulative effects assessment. The format of this information varies between project based on the stage it is at in the EIA or plan preparation process, for example this may include Scoping Reports or ESs.

Intra - Project Cumulative Effects

4.5.37 Intra-project cumulative effects occur where a single receptor is affected by more than one source of impact arising from different aspects of the Scheme. For example an intra-project effect would be where a local residential property is affected by dust, noise and traffic disruption during construction, with the result being a greater nuisance than each individual effect alone.

Uncertainty and Limitations

4.5.38 Uncertainty and limitations are outlined in specialist chapters where relevant. For example Chapter 7: Ecology and Nature Conservation provides a section detailing limitations and technical assumptions that have been incorporated into the assessment including a statement to say '*ecological surveys were considered representative and robust, as they were based on the industry-standard best practice survey guidance that was relevant at the time the surveys were undertaken*'.

Transboundary Screening

4.5.39 In accordance with the requirements of PINS Advice Note 12: *Development with significant transboundary impacts consultation*, PINS would screen on the Secretary of State's behalf whether the Scheme is likely to have significant effects on the environment of another European Economic Area (EEA) State. PINS Advice Note 12 states: "*It would assist the Secretary of State to meet the duty under Regulation 24 of the EIA Regulations if developers carried out their own preparatory work to complete a screening matrix.*" Table 4-5 provides the information to inform the screening exercise to be completed by PINS.

Table 4-5 EIA Methodology - Information to Inform a Transboundary Screening Decision by PINS

Screening Criteria	Commentary and Location of Relevant Information in this Environmental Statement
Characteristics of the Development	Characteristics of the Scheme are outlined in Chapter 2: Scheme Description, DCO Document Reference 6.2.
Geographical Area	The Scheme would not require development or potential environmental impacts on any area under the jurisdiction of any other EEA State.
Location of the Development	The Scheme is located approximately 3km east of Kingston upon Hull and comprises a new pipeline installed within a bored tunnel. The Feeder 9 Gas Transmission Pipeline crosses the Humber Estuary between Goxhill AGI on the southern bank of the Estuary and Paull AGI on the northern bank. The Scheme would run directly underneath the Humber Estuary (at least 7m below the true bed). Further details are provided in Chapter 2: Scheme Description (DCO Document Reference 6.2).
Cumulative Impacts	There are a number of other schemes being developed near the Scheme and these are identified in Chapter 14: Cumulative Effects (DCO Document Reference 6.14). There would be no significant cumulative transboundary impacts
Carrier	The potential for pollution via air, land and water. Chapter 5: Air Quality (DCO Document Reference 6.5), Chapter 8: Geology and Soils (DCO Document Reference 6.8) and Chapter 13: Water Resources (DCO Document Reference 6.13) provide details of effects on air, land and water.
Environmental Importance	Information regarding environmental constraints and designations is provided in all chapters of this ES (DCO Document References 6.1 to 6.14).
Extent	Based on the information presented in the ES (DCO Document References 6.1 to 6.14), no significant effects are identified that could impact on another EEA Member State.
Magnitude	
Probability	
Duration	
Frequency	
Reversibility	

4.6 The Rochdale Envelope

4.6.1 A Main Works Contractor has not yet been appointed for the Scheme and therefore, there remains a degree of uncertainty about how certain elements of the Scheme would be delivered. Therefore, there is a need to retain a degree of

flexibility for the contractor to ensure innovation and prevent prohibitive restrictions on their working methods.

4.6.2 PINS Advice Note Nine states 'The 'Rochdale Envelope' is an acknowledged way of dealing with an application comprising EIA development where details of a project have not been resolved at the time when the application is submitted'. It also states that 'The challenge for the EIA will be to ensure that all realistic and likely worst case variations of the project have been properly considered and clearly set out in the ES and as such that the likely significant impacts have been adequately assessed' and that 'the project should be described in such a way that a robust EIA can be undertaken'.

4.6.3 The paragraphs below outline where a 'Rochdale Envelope' approach has been used for a particular component of the Scheme and indicate if relevant to individual topic chapters.

Tunnel Boring Machine

4.6.4 The selection of the Tunnel Boring Machine (TBM) would depend upon the findings of the ground investigation, detailed design and be confirmed by the appointed Main Works Contractor. Therefore the TBM could be an Earth Pressure TBM or a Slurry TBM.

4.6.5 For the purposes of the assessment it is assumed that a Slurry TBM would be used as this would result in a greater requirement for processing and, therefore, more infrastructure. However, Scheme site layouts allow for both options. This is particularly relevant to the landscape and visual amenity assessment as there would be a requirement for more infrastructure for the slurry treatment plant.

4.6.6 Traffic numbers for the Scheme allow for the worst case scenario and the import and export of all relevant infrastructure for either of the options. This is reflected in relevant chapters e.g. Chapter 5: Air Quality (DCO Document Reference 6.5), Noise and Vibration (DCO Document Reference 6.10) and Traffic and Transport (DCO Document Reference 6.12).

Pipeline Hydrostatic Testing

4.6.7 There are three options for sourcing the water for hydrostatic testing of the pipeline mains supplies; importing the water or use of water created from the dewatering process to establish the drive pit.

4.6.8 Traffic numbers for the Scheme allow for the worst case scenario and the import of water to the site and this is reflected in relevant chapters e.g. Chapter 5: Air Quality (DCO Document Reference 6.5), Noise and Vibration (DCO Document Reference 6.10) and Traffic and Transport (DCO Document Reference 6.12).

4.6.9 The Scheme layout (DCO Document Reference 2.4) allows for sufficient areas for storage of water and this has been assessed in topic chapters where land take and use issues are relevant. This has also been considered in the Flood Risk Assessment (DCO Document Reference 5.2).

Management of Tunnel Arisings

- 4.6.10 The current options under consideration for management of the tunnel arisings are:
- Storage on site during the construction works and then a re-use of the material, for example within a managed flood defence realignment scheme along the Humber Estuary to be delivered by the Environment Agency or potentially within the Able Marine Energy Park;
 - Storage on site during the construction works and then spreading on agricultural land to provide a benefit to local agricultural land; and
 - Off-site disposal at a licensed waste management facility in the event of neither of the above options proving viable following further engagement with relevant organisations and appropriate permitting.
- 4.6.11 Traffic numbers for the Scheme allow for the worst case scenario and the removal of all waste spoil off site to either another development or site or a landfill.
- 4.6.12 Sufficient land is also allocated within the Scheme layout (DCO Document Reference 2.4) at Goxhill for the storage of the materials during the works in bunds and this has also been assessed in topic chapters.

4.7 Construction Environmental Management

The Approach

- 4.7.1 National Grid Gas would require their Main Works Contractor to have an Environmental Management System certificated to ISO 14001. Other contractors would also be expected to work to the principles of ISO 14001. The contractor is responsible under legislation and the contract for minimising and controlling the potential environmental impacts of all contract activities. The contractor(s) would also comply with National Grid Gas' Stakeholder, Community and Amenity Policy as well as other National Grid Gas prevailing policies outlined in the contract requirements.
- 4.7.2 Environmental management during construction would be guided by the following plans:
- Initial CEMP (DCO Document Reference 7.3) which includes measures to control noise and vibration, dust, pollution and also commitments in relation to site restoration for specific landowners;
 - Site Waste Management Plan (SWMP) that would be developed by the Main Works Contractor;
 - Initial Site Water Management Plan (DCO Document Reference 6.13.2) (note that a Flood Incident Response Plan forms an appendix to the Flood Risk Assessment (DCO Document Reference 5.2); and
 - Initial Traffic Management Plan (DCO Document Reference 7.2.1).

- 4.7.3 All project personnel would receive environmental (as well as health and safety) training including:
- Induction training covering project specific environmental site issues (Pollution Control, Waste Management, Water Management, Emergency Response and Traffic Management);
 - Background to and importance of all of the environmental management documentation;
 - Details of community liaison issues and how to deal with any concerns raised by third parties;
 - Environmental awareness training; and
 - Toolbox talks on task specific environmental issues.
- 4.7.4 All construction works would be undertaken in accordance with the prevailing best practice guidance and there would be adherence to Environment Agency Pollution Prevention Guidelines.

CEMP

- 4.7.5 The Main Works Contractor would develop the Initial CEMP (DCO Document Reference 7.3) into a Project Environmental Management Plan (PEMP), in accordance with ISO 14001, and develop and integrate the appropriate arrangements and procedures that support the PEMP. The environmental performance of the contractors would be monitored throughout the construction process through regular audits, inspections and reviews by National Grid Gas as well as internal audits carried out by the contractors.
- 4.7.6 An Initial CEMP (DCO Document Reference 7.3) has been prepared to reflect the Scheme and the environmental design / enhancement along with residual effects that have been identified in this ES. The Initial CEMP (DCO Document Reference 7.3) has been developed as the Scheme has progressed and will be developed further into the PEMP if the Scheme is granted consent - to cover all Scheme phases including any aftercare requirements, for example for landscaping.

SWMP

- 4.7.7 The Main Works Contractor would develop a SWMP for the Scheme during detailed design and prior to construction commencing (the SWMP would be a live document and updated regularly during the course of the construction of the Scheme).
- 4.7.8 The SWMP would be used to record how waste is reduced, reused, recycled and disposed of by the project team. As a minimum this would:
- Record decisions taken to prevent waste through concept and design;
 - Forecast waste produced onsite;
 - Plan how to reduce, reuse and then recover the forecast waste;

- Outline how all legislative requirements will be achieved;
- Implement and monitor the planned activity; and
- Detail review mechanisms for future projects.

4.7.9 The SWMP would comply with Government guidelines and any planning requirements. It should also utilise the WRAP Template² and be aligned with WRAP standard-good-best practice.

Site Water Management Plan

4.7.10 The Main Works Contractor would develop the Initial Site Water Management Plan in order to ensure effective pollution control, effective water management and to manage all water on site at the Scheme. An Initial Site Water Management Plan has been developed for the ES (DCO Document Reference 6.13.2) with further details in Chapter 13: Water Resources, DCO Document Reference 6.13.

4.7.11 A Flood Incident Response Plan would also be developed and a draft is appended to the Flood Risk Assessment (DCO Document Reference 5.2). This would be developed and refined by the Main Works Contractor in consultation with East Riding of Yorkshire Council and North Lincolnshire Council (the two Lead Local Flood Risk Authorities within the study area), North East Lindsey Drainage Board, South Holderness Internal Drainage Board, National Grid Gas and the Environment Agency as well as the Police and Fire and Rescue Services.

Traffic Management Plan

4.7.12 An Initial Traffic Management Plan (DCO Document Reference 7.2.1) has been prepared in tandem with the Transport Assessment (DCO Document Reference 7.2). The Plan identifies provisional traffic routes for light site vehicles, Heavy Goods Vehicles (HGV) and abnormal loads. Carriageway restrictions such as bridges are also identified on the routes.

4.7.13 The provisional routes identified have been developed taking into account the following:

- Avoidance, where possible, of sensitive areas such as residential areas, schools, etc.;
- Avoidance, where possible, of narrow roads, humpback bridges, steep gradients, sinuous roads, etc.;
- Compliance with statutory limits (e.g. width, height, gross weight, axle loading, etc.);
- Compliance with any highway authority lorry route schemes; and
- Overhead cable restrictions.

² <http://www.wrap.org.uk/content/site-waste-management-plans-1>

- 4.7.14 The Plan is a live document and will be continually developed throughout detailed design and construction.

4.8 References

Department for Communities and Local Government (2012) *National Planning Policy Framework*

Department for Energy and Climate Change (2011) *National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)*

Department for Energy and Climate Change (2011) *Overarching National Policy Statement for Energy (EN-1)*

Highways Agency (August, 2008) *Design Manual for Roads and Bridges HA205/08 Volume 11, Section 5, Part 2*

National Grid (2010) *Stakeholder, Community and Amenity Policy*

Planning Inspectorate (2012) *Advice Note Eight: How to get involved in the planning process*

Planning Inspectorate (2012) *Advice Note Eleven: Working with public bodies in the infrastructure planning process*

Planning Inspectorate (2014) *Advice Note Fifteen: Drafting Development Consent Orders*

Planning Inspectorate (2012) *Advice Note Nine: Rochdale Envelope*

Planning Inspectorate (2013) *Advice Note Seven: EIA, Screening and Scoping*

Planning Inspectorate (2014) *Advice Note Six: Preparation and Submission of Application Documents*

Planning Inspectorate (2012) *Advice Note Sixteen: The Developer's Pre-application Consultation, Publicity and Notification Duties*

Planning Inspectorate (2013) *Advice Note Three: EIA Consultation and Notification*

Planning Inspectorate (2012) *Advice Note Twelve: Development with Significant Transboundary Impacts Consultation*

Public Gas Transporter Pipeline Works (EIA) Regulations 1999 Available at: http://www.legislation.gov.uk/ukxi/1999/1672/pdfs/ukxi_19991672_en.pdf (online)

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The Infrastructure Planning (EIA) Regulations 2009 as amended Available at:
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