

## 9.0 AIR QUALITY

### Introduction

- 9.1 This chapter of the ES assesses the potential effects of the Proposed Development in terms of air quality.
- 9.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Assessment Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset and significant adverse effects; and the likely residual effects after these measures have been employed. This chapter has been prepared by URS Infrastructure and Environment Limited (URS).
- 9.3 In addition to a planning consent the Proposed Development will also require an Environmental Permit to operate. The Environmental Permit will be regulated by the Environment Agency. The Environmental Permit application process is a separate process to the planning process which focuses on the pollution control of the Proposed Development (e.g. air and odour emissions controls).

### Planning Policy Context

- 9.4 This section presents the national legislation, national planning policy, regional planning policy and local planning policy that are of relevance to the air quality assessment relating to the Proposed Development. Compliance of the Proposed Development with respect to air quality policy and legislation will be discussed in the Residual Effects and Summary Sections of this chapter.

### National Legislation

- 9.5 The principal air quality legislation within the United Kingdom is the Air Quality Standards Regulations 2010 (Ref. 9.1), which came into force in June 2010 and brings together the Government's requirements to transpose the separate EU Daughter Directives into national legislation through a single consolidated statutory instrument.
- 9.6 In addition, the Environment Act 1995 (Ref. 9.2) requires the Government to produce a national Air Quality Strategy (AQS) containing standards, objectives, and measures for improving ambient air quality and to keep the policies identified below under review. It also requires that Local Authorities undertake a tiered appraisal of air quality within their borough

to establish compliance or non-compliance with the targets established in the AQS. Where the objectives are likely to be exceeded, the Authority must designate an Air Quality Management Area (AQMA) and establish an Action Plan for the region, which outlines measures to achieve the objectives.

- 9.7 The AQS for England, Scotland, Wales and Northern Ireland (Ref. 9.3) provides the overarching strategic framework for air quality management in the UK and contains national air quality standards and objectives established by the Government to protect human health. These objectives apply to outdoor locations where people are regularly present and do not apply to occupational, indoor, or in-vehicle exposure.
- 9.8 The air quality objectives applicable to Local Air Quality Management are set out in the Air Quality Regulations 2000 (Ref. 9.4) and the Air Quality (Amendment) Regulations 2002 (Ref. 9.5). The Air Quality Standards Regulations 2010 (Ref. 9.1) include additional objectives for arsenic, cadmium, nickel and PM<sub>2.5</sub>. However the AQS does not contain objectives for these pollutants and local authorities have no statutory obligation to currently review and assess concentrations of these species locally.
- 9.9 Current assessment criteria applicable to the protection of human health and Local Air Quality Management based on the recent AQS and the 2010 Regulations are presented in **Table 9.1**. Concentrations are expressed in mass pollutant (micrograms) per cubic metre of air ( $\mu\text{g}/\text{m}^3$ ).

**Table 9.1: Air Quality Strategy Objectives ( $\mu\text{g}/\text{m}^3$ )**

Pollutant	Objective	Averaging period	Percentile	To be met by and maintained after
Nitrogen dioxide (NO <sub>2</sub> )	200	1 hour	99.8 <sup>th</sup> (18 exceedances/year)	31 Dec 2005
	40	Annual	Mean	31 Dec 2005
Particulate matter (PM <sub>10</sub> )	40	Annual	Mean	31 Dec 2004
	50	24 hour	90.4 <sup>th</sup> (35 exceedances/year)	31 Dec 2004
Carbon monoxide (CO)	10,000	8-hour	100 <sup>th</sup>	31 Dec 2003
Benzene	5	Annual	Mean	31 Dec 2010
1,3 butadiene	2.25	Annual	Mean	31 Dec 2003
Lead	0.25	Annual	Mean	31 Dec 2008
Poly aromatic hydrocarbons (PAH) ( $\text{ng}/\text{m}^3$ )	0.25	Annual	Mean	31 Dec 2010
Sulphur dioxide (SO <sub>2</sub> )	266	15 minute	99.9 <sup>th</sup> (35 exceedances/year)	31 Dec 2005
	350	1 hour	99.7 <sup>th</sup> (24 exceedances/year)	31 Dec 2004

Pollutant	Objective	Averaging period	Percentile	To be met by and maintained after
	125	24 hour	99.2 <sup>nd</sup> (3 exceedances/year)	31 Dec 2004

9.10 In addition, a number of objectives have been developed for the protection of vegetation and ecosystems, these are shown in **Table 9.2**.

**Table 9.2: Air Quality Strategy Objectives – Protection of Vegetation and Ecosystems**

Pollutant	Objective	Averaging period	Percentile	To be met by
Oxides of Nitrogen (NO <sub>x</sub> )	30 µg/m <sup>3</sup>	Annual	Mean	31 Dec 00
Sulphur dioxide (SO <sub>2</sub> )	20 µg/m <sup>3</sup>	Annual	Mean	31 Dec 00
Ozone	18 mg/m <sup>3</sup>	5 year average of summer 1 hour values		1 Jan 2010

9.11 The above legislation relates to concentrations of pollutants in ambient air with respect to human health or vegetation. There are no legislative standards or agreed guidelines for dust nuisance in the UK, for example due to dust deposition. Most issues of dust nuisance are covered through Statutory Nuisance legislation defined in the Environmental Protection Act, Part III, 1990, Section 79, Parts (d) and (e) which covers dust (Ref. 9.6):

*“d) Any dust, smell or effluvia arising on industrial, trade, or business premises and being prejudicial to health or a nuisance;*

*e) Any accumulation or deposit which is prejudicial to health or a nuisance.”*

9.12 In the absence of legislative standards there are however a number of non-statutory guidelines that are available when measuring the effect of dust deposition. For example for dust deposition, the Environment Agency has set a custom and practice limit of 200 mg/m<sup>2</sup>/day (Ref. 9.7).

#### National Planning Policy

9.13 Air quality is considered in a range of national policy guidance notes and statements including general pollution control statements, local air quality policy guidance, transport guidance notes and also minerals planning notes. This sub-section identifies the key national policy guidance from these policy areas.

*National Planning Policy Framework (March 2012) (Ref. 9.8)*

9.14 The National Planning Policy Framework (NPPF) was published in March 2012 (Ref. 9.8), paragraph 109 of the NPPF states that:

***“The planning system should contribute to and enhance the natural and local environment by:***

- preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability...”***

9.15 Annex 2 of the NPPF defines 'Pollution' as:

***“Anything that affects the quality of land, air, water or soils, which might lead to an adverse impact on human health, the natural environment or general amenity. Pollution can arise from a range of emissions, including smoke, fumes, gases, dust, steam, odour, noise and light.”***

9.16 There are both national and local policies for the control of air pollution and for the management of local air quality within the North York Moors National Park Authority (NYMNP) area. The effect of the Proposed Development on the achievement of such policies and plans are matters that may be a material consideration by planning authorities, when making decisions for individual planning applications. Paragraph 124 of the NPPF states that:

***“Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.”***

9.17 The different roles of a planning authority and a pollution control authority is addressed by the NPPF in paragraph 122:

***“... local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be***

***revisited through the permitting regimes operated by pollution control authorities."***

- 9.18 The NPPF is accompanied by Technical Guidance to the National Planning Policy Framework (NPPF-TG) (Ref: 9.9). The NPPF provides some broader guidance on assessments of dust impacts from mineral extraction sites that have been cited in the methodology of this assessment.

*Policy Guidance Note LAQM.PG(09) (Ref. 9.10)*

- 9.19 Policy Guidance Note LAQM.PG(09) (Ref. 9.10) considers all aspects of local air quality management policy, including air quality reviews and assessments, air quality action planning, transport planning, and land use planning. It provides specific guidance on developing local air quality strategies; however the structure and format of a local air quality strategy is entirely up to the local authority.

Local Planning Policy

- 9.20 Local planning policy applicable to the Proposed Development comprises policy prepared by North York Moors National Park Authority (NYMNPA) and Ryedale District Council.

*NYMNPA Core Strategy and Development Policies Document (Ref. 9.11)*

- 9.21 NYMNPA published its Core Strategy and Development Policies Document in November 2008 (Ref. 9.11). This document includes a number of air quality references, and notes that good air quality is one of the special qualities of the National Park. As one of the special qualities of the National Park, air quality is protected in Development Policy 1 – Environmental Protection Item 1:

***"To conserve and enhance the special qualities of the North York Moors National Park, development will only be permitted where: 1 It will not have an unacceptable adverse impact on surface and groundwater, soil, air quality and agricultural land."***

- 9.22 No Supplementary Planning Documents (SPD) or Supplementary Planning Guidance (SPG) for air quality has been published by the NYMNPA.

*Ryedale Local Plan, March 2002 (Ref. 9.12)*

- 9.23 Local planning policy with respect to air quality is also presented for RDC whom have responsibility for local air quality management.
- 9.24 RDC has a range of 'saved' local plan policies (Ref. 9.12) including the Chapter 15 – Landscape, Wildlife and Environmental Quality policies ENV2, ENV3, ENV5, ENV7, ENV12, ENV13 and ENV18. None of these policies directly relate to air quality.

*The Ryedale Plan – Local Plan Strategy May 2012 (Submission Document) (Ref. 10.13)*

- 9.25 RDC have recently submitted the Ryedale Plan: Local Plan Strategy (Ref. 10.13) to the Secretary of State for formal examination. The document proposes key policies for managing growth and change across the District to 2027. Once adopted this Local Plan Strategy will form part of the Development Plan for RDC. This document considers air quality in policy: SP 17 Managing Air Quality, Land and Water Resources. This policy states that:

***Air Quality will be protected and improved by:***

- ***Locating and managing development to reduce traffic congestion and air pollution and promote the use of alternative forms of travel to the private car.***
- ***Supporting measures to encourage non-car based means of travel or the use of low emission vehicles.***
- ***Reducing air quality emissions from buildings through renewable energy provision and sustainable building standards in line with policy SP18.***
- ***Requiring development proposals within or adjoining the Malton Air Quality Management Area to demonstrate how effects on air quality will be mitigated and further human exposure to poor air quality reduced. All development proposals within or near to the Air Quality Management Area which are likely to impact upon air quality; which are sensitive to poor air quality or which would conflict with any Air Quality Action Plan will be accompanied by an Air Quality Assessment.***
- ***Only permitting development if the individual or cumulative impact on air quality is acceptable and appropriate mitigation measures are secured.***

- 9.26 No Supplementary Planning Documents (SPD) or Supplementary Planning Guidance (SPG) for air quality has been published by RDC.
- 9.27 The Malton Air Quality Management Area (AQMA) Order was designated by Ryedale District Council on 14 December 2009. An Action Plan has subsequently been prepared by RDC to improve air quality in this AQMA (Ref. 9.14). This includes a range of measures including a

major junction improvement, a scheme to reduce the flow of traffic through the AQMA and measures to facilitate modal shift from private vehicles.

### **Assessment Methodology**

9.28 This section identifies the study pollutants associated with the different potential emission sources associated with the construction, operation, decommissioning and restoration of the Proposed Development. The section also identifies the sensitive receptors that could potentially be affected by the emission sources, describes the prevailing meteorological conditions and describes the significance criteria used to determine the significance of effects on these receptors. The section also describes the assessment methodology utilised for each potential emission source.

#### Study Pollutants

9.29 The following paragraphs identify the relevant study pollutants from the identified potential sources of pollutants in the Proposed Development including vehicle emissions from road vehicles, construction dust emissions (e.g. construction, decommissioning and restoration), and operational plant emissions (e.g. gas fuelled electric generator ).

9.30 Vehicle exhaust emissions (e.g. from petrol and diesel combustion) comprise a complex mixture of organic and inorganic substances. Of these emissions, assessment criteria for the protection of human health exist for the following pollutants:

- Fine particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>);
- Nitrogen dioxide (NO<sub>2</sub>);
- Sulphur dioxide (SO<sub>2</sub>);
- Carbon monoxide (CO);
- Benzene;
- 1,3-butadiene;
- Lead; and
- Poly Aromatic Hydrocarbons (PAHs).

9.31 These pollutants are currently regulated because of their known or suspected deleterious effects upon human health, and because historically, relatively high concentrations have been recorded within and downwind of urban centres.

9.32 Within this assessment of vehicular emissions, only PM<sub>10</sub> and NO<sub>2</sub> emissions have been considered. Lead is not included as it is no longer added to petrol fuels and therefore, lead

emissions from vehicles are not considered significant nationally. SO<sub>2</sub> emissions from vehicles are also considered to be insignificant since the introduction of low sulphur diesel and the negligible sulphur content of petrol fuels. The only AQMAs to have been designated within the UK as a result of exceedances of CO, benzene, PAH or 1,3-butadiene objectives was for benzene which was designated by Plymouth City Council, therefore, no quantitative assessment of these pollutants is considered necessary or has been provided as part of this assessment.

- 9.33 The key pollutants of concern with respect to construction activities are suspended dust (e.g. PM<sub>10</sub>) and accumulated dust (soiling/deposition). This is due to the movement of on-site plant equipment, movement of materials on-site and stockpiling of materials on-site. In consultation with the designers of the Proposed Development no notable odour sources have been identified for the construction phase and therefore construction odours are not considered further.
- 9.34 The key pollutants for the Proposed Development have been determined from a review of the Environment Agency Combustion Activities Guidance Note (Ref. 9.15). The review indicates that for natural gas related combustion, Oxides of Nitrogen (NO<sub>x</sub>), Carbon Monoxide (CO), Methane (CH<sub>4</sub>) and Carbon Dioxide (CO<sub>2</sub>) are the main pollutants (See **Table 9.3**). However, CH<sub>4</sub> and CO<sub>2</sub> are of concern with respect to greenhouse gases and climate change rather than for local air quality. Climate change is not considered to be a significant issue for the Proposed Development (which excludes combustion activities at Knapton Generating Site (KGS)) as limited combustion will be undertaken at the Ebberston Moor 'A' Well Site .
- 9.35 The operational assessment will therefore focus on NO<sub>x</sub> and CO. Additionally, as the gas that will be processed at the Assessment Site is a natural gas. This natural gas may contain sulphur, Hydrogen Sulphide (H<sub>2</sub>S) and other odourous compounds (mercaptans), which will also be considered.

**Table 9.3: Guide to Air Pollutants - Combustion**

Fuel Type	Inputs	Potential air emissions
Solid	Coal	NO <sub>x</sub> , CO, CO <sub>2</sub> , particulate matter (including PM <sub>10</sub> ), fugitive dust, trace metals, polychlorinated biphenyls (PCBs) and Polycyclic Aromatic Hydrocarbons (PAHs), hydrogen halides, methane (CH <sub>4</sub> ), Non Methane Volatile Organic Compounds (NMVOCs), dioxins and nitrous oxide (N <sub>2</sub> O).
	Biomass	NO <sub>x</sub> , CO, CO <sub>2</sub> , SO <sub>x</sub> , Particulate matter (including PM <sub>10</sub> ), CH <sub>4</sub> , NMVOCs and trace metals (from sewage sludge).
Liquid	Fuel Oil	NO <sub>x</sub> , CO, CO <sub>2</sub> , SO <sub>x</sub> , particulate matter (including PM <sub>10</sub> ), PCBs and PAHs, hydrogen chloride, trace metals and dioxins.
Gaseous	Natural Gas	NO <sub>x</sub> , CO, CO <sub>2</sub> , CH <sub>4</sub>



Fuel Type	Inputs	Potential air emissions
Secondary fuels	Solid, liquid or gaseous	NO <sub>x</sub> , CO, CO <sub>2</sub> , SO <sub>x</sub> , particulate matter (including PM <sub>10</sub> ), PCBs and PAHs, hydrogen halides, trace metals, NMVOCs, hydrogen sulphide (H <sub>2</sub> S), ammonia and dioxins.

9.36 The study pollutants described in the preceding paragraphs have been selected based on the potential of the pollutants to generate adverse odours, adversely affect human health or adversely affect vegetation and sensitive ecosystems. The known health effects of some of the key identified study species are briefly discussed below:

- Particulate matter – Health based assessment criteria focus on the fine 'PM<sub>10</sub>' and 'PM<sub>2.5</sub>', size fractions. PM<sub>10</sub> and PM<sub>2.5</sub> are defined as particulate matter with an aerodynamic diameter of less than 10 microns and 2.5 microns respectively. Emissions of particulates from construction activities and combustion processes are likely to contain a range of particulate sizes, including many larger than 10 microns in diameter. However for the purposes of a worst-case assessment and to enable comparison with national air quality objectives, these have been assumed to constitute PM<sub>10</sub>. Although the health effects of fine particulate matter are currently the subject of much research, the possible association between exposure to increased levels and respiratory and cardiovascular illness, and mortality has previously been acknowledged. Recent reviews by the World Health Organisation (WHO) and the Committee on the Medical Effects of Air Pollutants (COMEAP) have suggested exposure to PM<sub>2.5</sub> gives a stronger association with adverse health than the larger particulate fractions.
- Nitrogen dioxide (NO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>) – Formed as a by-product of high temperature combustion by the oxidation of nitrogen in the air and the fuel. NO<sub>x</sub> emissions primarily consist of nitric oxide (NO), which is oxidised in the atmosphere to produce NO<sub>2</sub>, as well as small quantities of NO<sub>2</sub> produced directly during combustion. For combustion sources, NO<sub>x</sub> emissions are typically in the NO:NO<sub>2</sub> ratio of 9:1. NO<sub>2</sub> is the component of NO<sub>x</sub> that is principally associated with health impacts, including effects on lung function and airway responsiveness, and potential increase in reactivity to natural allergens.
- CO - Formed when incomplete combustion of carbon-containing fuels occurs, due to insufficient oxygen being present. CO affects the transport of oxygen around the body by the blood. At very high levels, it can lead to a significant reduction in the supply of oxygen to the heart, particularly in people suffering from heart disease.
- H<sub>2</sub>S - Present in natural gas, which when burnt oxidises to SO<sub>2</sub>. However, in some circumstances not all H<sub>2</sub>S present is oxidised to SO<sub>2</sub>. The residual H<sub>2</sub>S can cause breathing difficulties and be fatal at very high concentrations (e.g. within enclosed

environments) and these type of health effects would not be anticipated in ambient air. H<sub>2</sub>S is also odorous with a characteristic rotten eggs odour.

- Mercaptans (or thiols) - Are colourless odorous sulphur containing organic gases, with an odour often described as rotten cabbage. They are considered to be an irritant when inhaled.

#### Sensitive Receptors and Land Uses

- 9.37 A number of sensitive receptors have been identified within the vicinity of the entire Proposed Development and these are detailed in **Table 9.4** and shown on **Figures 9.1** and **9.2**. **Table 9.4** includes a column to identify whether a receptor is associated with the Eberston Moor 'A' Well Site or the pipeline (including connections to the KGS e.g. R15 and R16). If the Eberston Moor EDS is constructed following a separate planning permission (Planning Ref. NYM/12013/0477/EIA), as described in Chapter 1 then the receptors identified to be associated with Eberston Moor 'A' Well Site will be far less likely to be affected by the Proposed Development as the majority of the infrastructure required at the Eberston Moor 'A' Well Site will have already been constructed (except for connection to the pipeline) and point sources (e.g. gas fuelled electric generator) will already be operational. Potential air quality effects on the receptors around Eberston Moor 'A' Well Site could occur as a result of the decommissioning of the Flare and Lockton Compound portion of the Eberston Moor EDS (see Cumulative Effects section).
- 9.38 The 28 receptors presented in **Table 9.4** and **Figures 9.1 and 9.2** are the closest to the Proposed Development in each compass direction within 4 km. Twenty five of the 27 receptors are locations of public exposure (i.e. residential locations) and three of the sites (R2, R11 and R28) are Sites of Special Scientific Interest (SSSI).
- 9.39 There are seventeen receptors in total identified within 1 km of the Proposed Development (R4, R7, and R14-R28).
- 9.40 Receptors R1 to R14 are separated from the Assessment Site by dense areas of plantation forestry associated with the Dalby Forest. The other receptors located further south along the pipeline, are located within agricultural areas and less dense areas of forestry.
- 9.41 The Proposed Development is located in an area of undulating topography as described in Chapter 8.

**Table 9.4: Identified Sensitive Receptors**

Receptor Number	Receptor Name	Grid Reference		Distance (km unless stated) and Direction	Phase
		X	Y		
R1	Bridestones	488430	490385	1.7 (NNW)	Eberston Moor 'A' Well Site
R2	Bridestones SSSI	487695	490660	2.4 (NNW)	Eberston Moor 'A' Well Site
R3	High Farm	489440	492595	2.9 (NNW)	Eberston Moor 'A' Well Site
R4	South Moor Farm	490490	490312	695m (NNE)	Eberston Moor 'A' Well Site
R5	Bickley Gate Farm	491189	491484	2.3 (NNE)	Eberston Moor 'A' Well Site
R6	Troutsdale Lodge	492470	489336	2.7 (E)	Eberston Moor 'A' Well Site
R7	Eberston Common Farm	490100	489415	250m (SE)	Eberston Moor 'A' Well Site
R8	Manor House	491846	488296	2.3 (SE)	Eberston Moor 'A' Well Site
R9	Broad Head Farm	490220	488195	1.5 (SSE)	Eberston Moor 'A' Well Site
R10	Hern Head House	491130	487465	2.2 (SSE)	Eberston Moor 'A' Well Site
R11	Troutsdale And Rosekirk Dale Fens SSSI	490035	487468	1.7 (S)	Eberston Moor 'A' Well Site
R12	High Scambridge Farm	489490	487945	1.9 (SSW)	Eberston Moor 'A' Well Site
R13	Stoneclose Campsite	486410	488825	3.7 (SSW)	Eberston Moor 'A' Well Site
R14	Jingleby Thorn	489332	489538	600m (SW)	Eberston Moor 'A' Well Site
R15	Ochre Farm	489021	477588	0.6 (NE)	Pipeline
R16	5 Knapton Railway Cottages	487349	476723	0.5 (SW)	Pipeline
R17	Difford Farm	487843	477812	0.3 (E)	Pipeline
R18	Knapton Lodge	487257	477586	0.15 (W)	Pipeline
R19	Wath House Farm	487465	478247	0.18 (E)	Pipeline
R20	Whitehall Farm	487546	479051	0.6 (E)	Pipeline
R21	Newstead Grange	486533	479403	0.33 (E)	Pipeline
R22	Crake Hall Cottage	487126	479654	0.23 (E)	Pipeline
R23	Grange Farm	487142	481551	0.11 (E)	Pipeline
R24	Cliff Edge Farm	487256	482906	0.16 (E)	Pipeline
R25	Green Howe	486369	482784	0.57 (W)	Pipeline
R26	Warren House	487426	484558	0.1 (E)	Pipeline

Receptor Number	Receptor Name	Grid Reference		Distance (km unless stated) and Direction	Phase
		X	Y		
R27	Givendale Head Farm	489288	487599	0.14 (E)	Pipeline
R28	Nabgate SSSI	486843	485006	0.45 (W)	Pipeline

#### Meteorological Conditions

9.42 Based on detailed meteorological data from Church Fenton, located approximately 48 km to the south west, the prevailing wind direction at the Proposed Development varies between the west and south west.

#### Significance Criteria

9.43 The assessment of potential effects and their significance has been based on the criteria outlined in the Environmental Protection UK (EPUK) "Development Control: Planning for Air Quality" publication (Ref. 9.16).

9.44 There are three aspects that must be taken into account when assessing the significance of the effect, these are:

- The magnitude of the change caused by the Proposed Development;
- The absolute predicted environmental concentration in relation to the air quality objectives; and
- The number of people exposed.

9.45 Particular significance should be given to a change that takes the concentration from below to above the national AQS objective or vice versa because of the importance ascribed to the objectives in assessing local air quality (see **Table 9.6**).

9.46 **Table 9.5** presents the EPUK criteria for the determination of the "magnitude of change", based on the percentage increase in pollutant concentrations due to the Proposed Development. **Table 9.6** presents the significance of the effects, taking into account the magnitude of change over baseline conditions and the absolute concentration in relation to air quality objectives.

**Table 9.5: Determination of Magnitude of Change**

Magnitude of change	Annual Mean Concentration (NO <sub>2</sub> and PM <sub>10</sub> )	Days PM <sub>10</sub> >50µg/m <sup>3</sup>
Large	Increase/decrease >10% (>4)	Increase/decrease >4 days
Medium	Increase/decrease 5-10% (2-4)	Increase/decrease 2-4 days
Small	Increase/decrease 1-5% (0.4-2)	Increase/decrease 1-2 days
Imperceptible	Increase/decrease <1% (<0.4)	Increase/decrease <1day

**Table 9.6: Significance of Effects**

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration			
	Imperceptible	Small	Medium	Large
<b>Increase with Proposed Development</b>				
Above Objective/Limit Value With Scheme (>40 µg/m <sup>3</sup> )	Negligible	Minor Adverse	Moderate Adverse	Major Adverse
Just Below Objective/Limit Value With Scheme (36-40 µg/m <sup>3</sup> )	Negligible	Minor Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value With Scheme (30-36 µg/m <sup>3</sup> )	Negligible	Negligible	Minor Adverse	Minor Adverse
Well Below Objective/Limit Value With Scheme (<30 µg/m <sup>3</sup> )	Negligible	Negligible	Negligible	Minor Adverse
<b>Decrease with Proposed Development</b>				
Above Objective/Limit Value Without Scheme (>40 µg/m <sup>3</sup> )	Negligible	Minor Beneficial	Moderate Beneficial	Major Beneficial
Just Below Objective/Limit Value Without Scheme (36-40 µg/m <sup>3</sup> )	Negligible	Minor Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value Without Scheme (30-36 µg/m <sup>3</sup> )	Negligible	Negligible	Minor Beneficial	Minor Beneficial
Well Below Objective/Limit Value Without Scheme (<30 µg/m <sup>3</sup> )	Negligible	Negligible	Negligible	Minor Beneficial

9.47 **Tables 9.5** and **9.6** provide a mechanism for categorising the magnitude of change and significance of effect at individual receptors. The descriptions of effect and significance from individual receptors should be utilised together with the following considerations to derive an overall judgement of significance of effect:

- Number of properties affected by minor, moderate or major air quality effects and a judgement on the overall balance;

- Where new exposure is being introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant;
- Whether or not an exceedence of an objective or limit value is predicted to arise in the study area where none existed before, or the size of an exceedence area is substantially increased;
- Whether or not the study area exceeds an objective or limit value and this exceedence is removed or the exceedence area is reduced in size;
- Uncertainty, including the extent to which worst case assumptions have been made in the assessment; and
- The extent to which an objective or limit value is exceeded, e.g. an annual mean NO<sub>2</sub> concentration of 40 µg/m<sup>3</sup> should attract less significance than an annual mean concentration of 50 µg/m<sup>3</sup>.

9.48 The EPUK guidance also indicates that it would be useful to outline the experience of the author undertaking an air quality assessment to provide confidence in the assessment of significance due to the role of professional judgement in this task. In this instance the air quality assessment has been supervised by Dr David Deakin a Principal Air Quality Consultant and member of the Institute of Air Quality Management (IAQM).

#### Assessment of Dust Emissions Generated During Construction Works

9.49 The assessment of dust for the construction of the Proposed Development has been undertaken following the four stages outlined in the NPPF-TG (Ref. 9.9) for dust emissions as listed below:

- **Stage 1:** Establish existing baseline conditions;
- **Stage 2:** Identify site activities that could lead to dust emission without mitigation;
- **Stage 3:** Identify site parameters which may increase potential impacts from dust; and
- **Stage 4:** Recommend mitigation measures and site design modifications.

9.50 In Stage 1: the identification of baseline conditions includes the establishment of baseline air quality, the location of sensitive receptors and the conditions likely to affect the migration of dust (e.g. prevailing wind). The information gathered in Stage 1 and 2 is utilised to evaluate the potential risks to air quality in Stage 3. Whilst in Stage 4 suitable mitigation measures to avoid significant adverse are identified.

9.51 The NPPF-TG (Ref. 9.9) also provides two pieces of guidance to assist in the evaluation stage concerning receptor sensitivity and also a series of key questions.

9.52 The guidance provided concerning sensitivity (based on Ireland, 1992 (Ref. 9.17)) indicates that receptors are considered to have varying sensitivities to dust nuisance ranging between: high, medium and low for example:

- Receptors considered to be high sensitivity include: hospitals and clinics, retirement homes, hi-tech industries, painting and furnishing and food processing;
- Receptors of medium sensitivity include: schools, residential areas, food retailers, glasshouses and nurseries, horticultural land and offices; and
- Low sensitivity receptors include: farms, light and heavy industry and outdoor storage areas.

9.53 The key questions in the evaluation of air quality risks are as follows:

- Are there residential properties and other sensitive uses within 1 km? and if not development can proceed implementing good practice measures only and no further assessment is required;
- Are  $PM_{10}$  concentrations likely to exceed relevant air quality objectives? and if not development can proceed implementing good practice measures only and no further assessment is required; and
- If there are sensitive receptors within 1 km and there are likely exceedances of  $PM_{10}$  air quality objectives then an assessment of effects and of mitigation measures is required to establish if effects can be adequately controlled and/or monitored or if refusal should be considered. However, if there are no receptors within 1km and there are no concerns over exceedances of  $PM_{10}$  air quality objectives then good practice measures should be considered only.

9.54 In 2000 the Building Research Establishment (BRE) (Ref. 9.18) undertook six months of continuous  $PM_{10}$  sampling at three locations within 200m of a demolition and construction site of 0.65 ha. The site was a former chemical works and required demolition of existing buildings, piling along some of the site boundary, excavation of soil to a depth of 1m across the site (greater than 1m in some areas), and the subsequent erection of new structures. During working hours, in the 6-month monitoring period,  $PM_{10}$  concentrations within 1m of the study site boundary increased by up to  $11 \mu\text{g}/\text{m}^3$  during demolition,  $3 \mu\text{g}/\text{m}^3$  during site preparation and  $5 \mu\text{g}/\text{m}^3$  during piling and earth working (including a period of piling at the site boundary).  $PM_{10}$  concentrations about 150m from the construction site were indistinguishable from background levels. The study utilised 'best practice' dust mitigation measures and the site did not receive any complaints concerning dust effects, despite the presence of residential properties within 10m of the site perimeter.

- 9.55 The findings of this BRE study have been applied to the Proposed Development, taking into consideration the ambient background levels of particulate matter for the area to assist in Stage 3 of the NPPF-TG assessment and in particular to consider the key question concerning potential exceedances of PM<sub>10</sub> air quality objectives.
- 9.56 The decommissioning and restoration phase of works is also briefly discussed as the activities involved in decommissioning and restoration will be very similar to those required for the construction phase.

#### Assessment of Road Traffic

- 9.57 A review of the potential for air quality effects associated with increases in road traffic during the construction, operational and decommissioning and restoration phases of the Proposed Development has been undertaken. The review has been undertaken as vehicles travelling to and from the Proposed Development have the potential to affect air quality with respect to PM<sub>10</sub> and NO<sub>2</sub>.
- 9.58 The level of assessment for road traffic emissions has been established by comparison of anticipated construction and operational traffic flows against the Design Manual for Roads and Bridges (DMRB) local air quality road traffic criteria (Ref. 9.19). The DMRB criteria enable significant traffic changes, with the potential to affect air quality, to be identified. Where significant traffic changes are identified, these are then modelled using either the DMRB air quality screening model or an advanced air quality dispersion model. The criteria for the identification of significant traffic changes outlined in the Environmental Protection UK (EPUK) document 'Development Control: Planning for Air Quality' have also been considered.

#### Assessment of Emissions from the Operational Plant

- 9.59 The Proposed Development includes a small natural gas fuelled electric generator of 1 MW and a small gas fired heater (KW) at the Ebberston Moor 'A' Well Site.
- 9.60 It is not considered necessary to undertake any additional assessment of the Knapton Generating Site (KGS) as the Proposed Development is for the provision of gas to the existing site only and therefore no significant change in combustion activities are envisaged at the KGS site. Additionally, no new infrastructure is anticipated to be required to treat or combust the gas delivered from the Ebberston Moor 'A' Well Site. The existing operation of the KGS site is regulated through an Environmental Permit by the Environment Agency and it is not envisaged that a change in gas well site will materially affect this Permit.



### Baseline Conditions

- 9.61 Baseline air quality conditions (i.e. annual long term pollutant concentrations) are presented in this section, and these conditions are applicable for both baseline scenarios (either with or without the Ebberston Moor EDS in operation ahead of the full Proposed Development). This is because significant changes in long term pollutant concentrations are not anticipated from the operation of the Ebberston Moor EDS.
- 9.62 NYMNPA does not have responsibility for local air quality management. This is the responsibility of RDC.
- 9.63 The statutory review and assessment of local air quality within the area by RDC has identified one AQMA under the Local Air Quality Management (LAQM) regime at Malton (approximately 18 km south west of the Proposed Development), as described below (Ref. 9.20):
- “An area in the centre of Malton encompassing properties along the B1248 (Castlegate and Yorkersgate, between Sheepfoot Hill and Market Street), and the B1257 (Wheelgate and Old Maltongate, between Finkle Street and 20m east of the junction with East Mount). The area also includes part of Church Hill.”*
- 9.64 The 2012 Updating and Screening Assessment (USA) for RDC (Ref. 9.21) did not identify any other areas which were likely to exceed air quality objectives.
- 9.65 In support of their air quality review and assessment work, RDC carry out passive monitoring for NO<sub>2</sub> using diffusion tubes, these are located within Malton, Norton, Pickering, Sherburn, Helmsley and Rillington. The closest of these sites to the Proposed Development is in Pickering, approximately 7 km to the west of the pipeline, and 11.5 km to the south west of the well site.
- 9.66 In the absence of suitable monitored background data, background NO<sub>2</sub> and PM<sub>10</sub> concentrations have been taken directly from the National Air Quality Archive Background maps for 2013 to provide levels for the baseline year (Ref. 9.22).
- 9.67 Concentrations of CO have been taken from the 2001 National Air Quality Archive Background Maps, which are the most recent background maps for CO (Ref. 9.23).

9.68 No reduction for year to year improvements in concentration for either NO<sub>2</sub>, PM<sub>10</sub> or CO have been reported, due to the current uncertainty in the rate of improvements in air quality over time.

9.69 **Table 9.7** presents all the relevant background ambient air quality data for the required averaging periods. In accordance with Environment Agency guidance (Ref. 9.24), in the absence of actual measured short term background concentrations, these have been assumed to be twice the annual average concentration.

**Table 9.7: Predicted Background Pollutant Concentrations ( $\mu\text{g}/\text{m}^3$ )**

Pollutant	Estimated Minimum Background concentration in Study Area (2013)	Estimated Maximum Background Concentration in Study Area (2013)	Objective	Averaging Period
CO	176	195	350	Annual mean
	352	390	10,000	Maximum 8 hr running mean
NO <sub>2</sub>	5.3	8.2	40	Annual mean
	10.6	16.4	200	1 hour, 99.8 <sup>th</sup> percentile
PM <sub>10</sub>	11.2	16.1	40	Annual mean
	22.4	32.2	50	Daily mean, 90.4 <sup>th</sup> percentile

9.70 For all pollutants assessed, background concentrations in 2013 are predicted to comply with the air quality standards.

### Likely Significant Effects

9.71 This section describes the likely significant effects from construction dust (including decommissioning and restoration), road traffic (construction and operation) and operational sources. The key differences in the consideration of likely significant effects for the above listed sources are as follows:

- Construction dust: If the Ebberston Moor EDS has not been constructed by a separate permission then Receptors R1 to R14 may be more likely to be affected by construction dust as the infrastructure required at the Ebberston Moor 'A' Well Site is constructed. There will also be a construction compound at the site. However, if the Ebberston Moor EDS has been constructed then Receptors R1 to R14 will have less potential to be affected by construction dust as the majority of the required infrastructure will have already been constructed (except the connection to the pipeline) and there would be far lower potential risk of construction dust effects for the Proposed Development at R1 to

R14.

- Road Traffic: Road traffic air quality effects are anticipated to be negligible whether the Ebberston Moor EDS has been constructed by a separate permission ahead of the Proposed Development or not due to the small numbers of vehicles anticipated with the operation or construction of either Proposals.
- Operational sources: If the Ebberston Moor EDS is not operational, by a separate permission, then Receptors R1 to R14 may be affected by operational emissions from the point sources at the Ebberston Moor 'A' Well Site. However, if the Ebberston Moor EDS is operational then there are no other point sources associated with the Ebberston Moor 'A' Well Site that would not already be operational under the Ebberston Moor EDS. Therefore, if the Ebberston Moor EDS is operational in advance of the Proposed Development then there are no new point sources to assess as at of the Proposed Development and no potential likely significant air quality effects.

#### Dust Emissions Generated During Construction and Decommissioning and Restoration Works

9.72 The guidance presented in the NPPF-TG (Ref. 9.9) indicates that there are two key questions in determining the risk of adverse air quality effects from minerals works, such as excavation of pipeline and construction works. Chapter 6 indicates that there will be the following construction activities:

- Site preparation (including excavation and grading);
- Provision of infrastructure;
- Construction; and
- Landscaping.

9.73 The decommissioning and restoration phases will also include similar activities as listed above for either scenario as described in Chapter 6 including:

- Dismantling and removal of plant, equipment, pipes, cables, buildings, security fencing, and surface installations;
- Concrete installations will be broken up and removed;
- The tarmac wearing and base course will be broken up and removed from the Assessment Site;
- The remaining sub base will be broken up and excavated to the depth of the original excavated subsoil depth; and
- Pest free sub-soil and topsoil will be replaced separately to the original depth before excavation to achieve a loose, uniform fill.

- 9.74 The first question considered in the NPPF-TG is if there are any sensitive receptors within 1 km. There are seventeen receptors within 1 km of the Proposed Development. Of these receptors only six are within 200m of the Proposed Development, as the majority of air quality effects would be within the first 200m, it is anticipated that most receptors will experience no significant air quality effects.
- 9.75 The second question is whether there is a risk of PM<sub>10</sub> air quality objectives being exceeded. Background PM<sub>10</sub> concentrations are anticipated to be very low, with annual average PM<sub>10</sub> concentrations of 16.1 µg/m<sup>3</sup>, which are approximately a third of the relevant annual objective and just over half of the 24-hour objective. Therefore, the risk of an exceedance is considered to be low, as confirmed by reference to the BRE case study findings.
- 9.76 In the BRE study changes in concentrations of PM<sub>10</sub> were indistinguishable from background PM<sub>10</sub> concentrations beyond 150m. There are four receptors within 150m of the Proposed Development, the closest of these is R26, located approximately 100m from construction works along the pipeline route. At the Ebberston Moor 'A' Well Site all receptors are all well over 150m from construction works (R7, approximately 250m).
- 9.77 The dust emission findings from a previous BRE study have been extrapolated to the construction of the Ebberston Moor 'A' Well Site and pipeline route. Based on the BRE study, the mean concentrations at the Assessment Site boundary arising from earth works and site preparation works could increase by 5µg/m<sup>3</sup> to 37.2µg/m<sup>3</sup> during site working hours, from a short term concentration of 32.2 µg/m<sup>3</sup> (based on the maximum background concentration presented in **Table 9.7**). This concentration is still within the AQS 24-hour objective of 50·g/m<sup>3</sup>.
- 9.78 On the basis of these findings, it is anticipated that construction dust will cause a negligible effect at the four receptors within 150m along the pipeline route. This is because during construction activities, PM<sub>10</sub> concentrations are predicted to remain below the 24-hour AQS objective of 50µg/m<sup>3</sup> (with no increase in the number of days of exceedance). Additionally, the changes in concentration at the receptors around Ebberston Moor 'A' Well Site (R1 to R14) are anticipated not to be discernible from background concentrations of particulates. This is also considered to be a negligible effect.
- 9.79 As described above if the Ebberston Moor EDS is constructed ahead of the construction of the pipeline then there would be even lower risk of potential dust effects on Receptors R1 to R14 as the majority of infrastructure would be in place at Ebberston Moor 'A' Well Site. As an even lower risk of dust effects would be anticipated for less extensive works then this would also be considered to be a negligible effect.

9.80 Similar negligible air quality effects will also be anticipated with any decommissioning and restoration phase of works.

#### Assessment of Road Traffic

9.81 The DMRB guidance states that assessment of affected roads is only considered necessary where proposals would result in:

- An increase in daily traffic flows by 1,000 or more;
- Daily Heavy Goods Vehicles (HGVs) flows will change by 200 or more;
- Daily average speed will change by 10 km/hr or more; or
- Peak hour speed will change by 20 km/hr or more.

9.82 Furthermore, the Environmental Protection UK (EPUK) document 'Development Control: Planning for Air Quality' states that an air quality assessment is not normally required unless:

- Proposals that will generate or increase traffic congestion, where 'congestion' manifests itself as an increase in periods with stop start driving; or
- Proposals that will give rise to a significant change in either traffic volumes, typically a change in annual average daily traffic (AADT) or peak traffic flows of greater than  $\pm 5\%$  or  $\pm 10\%$ , depending on local circumstances (a change of  $\pm 5\%$  will be appropriate for traffic flows within an AQMA), or in vehicle speed (typically of more than  $\pm 10$  kph), or both, usually on a road with more than 10,000 AADT (5,000 if 'narrow and congested'); or
- Proposals that would significantly alter the traffic composition on local roads, for instance, increase the number of HDVs by say 200 movements or more per day, due to the development of a bus station or an HGV park (professional judgement will be required, taking account of the total vehicle flow as well as the change); or
- Proposals that include significant new car parking, which may be taken to be more than 100 spaces outside an AQMA or 50 spaces inside an AQMA. Account should also be taken of car park turnover, i.e. the difference between short-term and long-term parking, which will affect the traffic flows into and out of the car park. This should also include proposals for new coach or lorry parks. These criteria are designed to trigger the requirement for the assessment of traffic on the local roads. It may also be appropriate to assess the emissions from within the car park itself; or
- Large, long-term construction sites that would generate large HGV flows (>200 movements per day) over a period of a year or more.

- 9.83 The traffic anticipated to be associated with the Proposed Development construction, operation and decommissioning and restoration phases are described in Chapter 11 Traffic and Transportation.
- 9.84 The traffic increases during the construction phase are anticipated to be below the level of change requiring further assessment against both DMRB and EPUK criteria as at worst 18 HGVs are anticipated per day with up to 48 other light vehicles per day (see Chapter 11, Likely Significant Effects: Construction Section for more details). It is therefore considered that the traffic effects of the Proposed Development during construction are insignificant in terms of local air quality, no further assessment is needed and construction traffic is deemed to be an effect of negligible significance.
- 9.85 Lower traffic flows are anticipated to be associated with the decommissioning and restoration phase (see Chapter 11 for more details) and therefore these will also result in changes in air quality of negligible significance.
- 9.86 During the operational phase of the Proposed Development, even fewer additional traffic movements are anticipated than during the construction period, with minimal traffic. See Chapter 11, Likely Significant Effects: Operation Section for more details. Therefore, the operational change in traffic flows is considered to be insignificant against the DMRB and EPUK criteria and is therefore deemed to have a negligible significance.

#### Operational Emissions

- 9.87 There are two combustion sources associated with the Proposed Development with a gas fired heater and a small natural gas fuelled electric generator (1 MW) within the Ebberston Moor 'A' Well Site.
- 9.88 The Environment Agency H1 guidance Note (Ref. 9.24) indicates that point sources that are less than 20 MW are '*small point sources*' and that:

***“For gas and distillate oil fired boilers with an aggregated thermal input less than 20MW and small point sources such as vents and short stacks a case may be made by the operator that the scale of the release does not warrant detailed modelling on the basis of limited environmental risk. This should be done preferably in discussion with the regulator.”***

- 9.89 It is considered that the natural gas fuelled electric generator and a small gas fired heater are small point sources (approximately 1/20th of the size considered small) which present a

very limited environmental risk, due to their small size and also the distance of public exposure and designated ecosystems from the well site (as listed above). Therefore, no quantitative assessment of these emissions has been undertaken. The emissions associated with the small natural gas fuelled electric generator (1 MW) and small gas fired heater (200KW) within the Ebberston Moor 'A' Well Site are considered insignificant for human health and vegetation.

- 9.90 Odour is also considered unlikely to be a significant issue as only small volumes of gas are to be combusted at the Ebberston Moor 'A' Well Site which may include some potentially odourous compounds. This will be confirmed in a Draft Odour Management Plan (OMP) which will be prepared for consultation with the relevant stakeholders prior to Construction. An OMP will also be a requirement of any Environmental Permit for the Proposed Development (See Paragraph 9.92).
- 9.91 In the event that the Ebberston Moor EDS is operational, in advance of the Proposed Development, then there are no other point sources associated with the Ebberston Moor 'A' Well Site that will not already be operational under the Ebberston Moor EDS. Therefore, if the Ebberston Moor EDS is operational in advance of the Proposed Development then there are no new point sources to assess at of the Proposed Development and no potential likely significant air quality effects.
- 9.92 In addition to a planning consent the Proposed Development will also require an Environmental Permit to operate. The Environmental Permit will be regulated by the Environment Agency. The Environmental Permit application process is a separate process to the planning process which focuses on the pollution control of the Proposed Development (e.g. air and odour emissions controls) associated with small natural gas fuelled electric generator etc. It is yet to be confirmed whether the permit required for the Proposed Development will consist of a variation to the permit already in place at KGS, or a whether there will be a separate application for a permit specifically for the operational activities at the well site along with a variation for KGS if necessary.

### **Mitigation Measures**

- 9.93 This section presents the mitigation measures appropriate to minimise the effect on air quality from construction, decommissioning and restoration or operational activities.

### Construction and Decommissioning and Restoration

- 9.94 Although a negligible effect is predicted for dust effects, these will be mitigated through the preparation and implementation of a dust management plan, which will be agreed in consultation with NYMNPA. This will result in an overall negligible effect.
- 9.95 In accordance with best practice, construction dust will be controlled through the application of a series of measures incorporated into the CEMP, including (where appropriate):
- Regular inspection and, where necessary, wet suppression of material/soil stockpiles (including wind shielding, storage away from site boundaries, and restricted height of stockpiles);
  - Appropriate orientation of material stockpiles to minimise wind dispersion;
  - Provision of wheel washing and wet suppression during loading of wagons/vehicles;
  - Covering vehicles carrying dry spoil and other wastes;
  - Shielding of dust-generating construction activities;
  - Provision of suitable site hoarding;
  - Restricting vehicle speeds on access roads and other unsurfaced areas of the Assessment Site; and
  - Inspection of unsurfaced haulage routes, and wet suppression as necessary, during prolonged dry periods.
- 9.96 A Principal Contractor will be appointed by the Applicant to develop and implement the CEMP, which will present a comprehensive list of mitigation measures, for agreement with NYMNPA and RDC.

### Operation

- 9.97 The Proposed Development has been designed to minimise emissions to air, and good management processes will be implemented at the Eberston Moor 'A' Well Site. The measures that are proposed at Eberston Moor 'A' Well Site in comparison to indicative Best Available Techniques (BAT) as outlined in the Environment Agency Gasification, Liquefaction and Refining Installations (EPR 1.02) Sector Guidance for natural gas refining (Ref. 9.25) are presented in **Table 9.8**.



**Table 9.8: Air Emission Mitigation Measures – Natural Gas Refining**

Item	Indicative BAT – You should, where appropriate	Proposed Implementation
1.	<i>'Minimise frequency of pig/sphere use by operating sea-lines at high velocity where practicable, i.e. use "mist flow" conditions, minimise recovery of spheres by use of receivers holding several devices and use of vent receivers of high pressure gas to a low pressure part of the process for gas recovery by recompression, before opening for access to pig/spheres.'</i>	Pigging of the piping between the well heads and the process piping will not be needed.
2.	<i>'Use sectioned vent and isolation systems which minimise the volume of gas to be released or allow high pressure gas to be vented by an enclosed header system to a low pressure part of the process for recompression.'</i>	The gas facility will include isolation valves to enable the isolation of relatively small, discrete sections of plant to minimise quantities of gas requiring venting.
3.	<i>'For planned depressurisation (e.g. of the sea line or process plant), minimise the quantity of gas released by venting down to as low a pressure as possible through the terminal process before flaring the remaining gas.'</i>	As the gas inventory is the primary resource it is in the interest of the operator / owner to vent as little gas as possible. As discussed in item 2, the plant will include isolation valves to enable the isolation of relatively small, discrete sections of plant to minimise the quantity of gas to be released.
4.	<i>'Gas streams with significant sulphur content should not be used as fuel.'</i>	Not applicable because gas treatment will be undertaken at the KGS separate to the Proposed Development application.
5.	<i>'Consider alternatives to direct releases of CO<sub>2</sub> particularly for large flows.'</i>	Not applicable.
6.	<i>'Dispose of mercury recovered from raw natural gas in an environmentally responsible way.'</i>	Not applicable. The gas is not expected to contain any mercury.

9.98 The comparisons of indicative BAT with the proposed air emissions mitigation measures indicates a high degree of compliance that will control emissions of pollutants to air, including odorous gases such as H<sub>2</sub>S and Mercaptans.

9.99 The BAT associated with treatment and conditioning of natural gas is not discussed herein as the processes utilised to treat the gas are located at the KGS. These are outside the planning application for the Proposed Development.

9.100 In the event that the Ebberston Moor EDS is completed ahead of the Proposed Development it is anticipated that the above operational BAT would be incorporated in to the Ebberston Moor 'A' Well Site. These measures will be in place for the Proposed Development.

### Residual Effects

9.101 This section discusses the anticipated level of effect following implementation of the aforementioned mitigation measures.

- 9.102 Any effects associated with construction, decommissioning or restoration dust are predicted to be negligible following mitigation (whether or not the Eberston Moor EDS is constructed in advance of the Proposed Development), as the closest receptor is approximately 100m from the areas of construction work and best practice dust mitigation measures will be utilised.
- 9.103 Traffic emissions associated with either the construction, operation or decommissioning and restoration phases of Proposed Development are negligible, as there are small numbers of vehicles associated with each of these phases.
- 9.104 Operational effects of the Development are considered to be negligible as only one small natural gas fuelled electric generator (1 MW), a small gas fired heater are included in the Proposed Development. These operational emissions will not be applicable to the Proposed Development if these have already been constructed and are operational as part of the Eberston Moor EDS.
- 9.105 The residual effects associated with each aspect that has been assessed is described in **Table 9.9**.

**Table 9.9: Summary of Effects Following Mitigation**

Phase	Nature of Effect	Temporal and Spatial Extent	Significance
Construction, decommissioning and restoration	Increase in fugitive dust emissions during construction	Temporary, Local	Negligible
	Construction traffic Emissions	Temporary, Local	Negligible
Operation	Operational traffic emissions	Temporary, Local	Negligible
	Operational plant emissions	Permanent, Local	Negligible

Note: Operational Plant Emissions are Not Applicable if these have already been constructed and are operational as part of the Eberston Moor EDS.

### Cumulative Effects

- 9.106 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 Ryedale Gas Project (ref: NY/2010/0159/ENV) and Eberston Moor EDS (ref: NYM/2013/0477/EIA). The Ryedale Gas Project comprises of the following five principal elements:

- Gas production from the Eberston South Well Site;

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

9.107 No significant cumulative construction effects would be anticipated between both developments, if both were constructed at the same time. This is because it would be unlikely that both construction works would be concentrated in the same location for a prolonged period and as both sets of construction works would be undertaken following CEMPs to minimise dust egress.

9.108 No significant operational cumulative effects will be anticipated with the operation of both the Ryedale Gas Project and the Proposed Development, due to the distance between any sources of air emissions and the small size of these emissions. For example the distance between the operational sources at the Ryedale Gas Project (Hurrell Lane) and the Proposed Development is approximately 9.5 km.

9.109 The potential for significant cumulative effects associated with the Ebberston Moor EDS being in operation prior to the proposed pipeline have also been considered. However, no significant cumulative effects have been identified as both projects are anticipated to have negligible overall air quality effects.

### **Summary**

9.110 The significance of effects for construction, decommissioning or restoration activities is considered to be negligible due to the distance of the activities from receptors, along with the dust management techniques that will be implemented through the CEMP. The effects associated with traffic are considered to be negligible, due to the small number of vehicles required to construct, operate, decommission and restore the Proposed Development. Operational air quality effects associated with small combustion sources at Ebberston Moor 'A' Well Site, if not already present through the operation of the Ebberston Moor EDS, are also considered to be negligible, due to the small amounts of gas that will be combusted on-site and because of the BAT that will be utilised on-site to manage emissions.

Odour is also considered unlikely to be a significant issue as only small volumes of gas are to be combusted at the Ebberston Moor 'A' Well Site which may include some potentially odourous compounds. This will be confirmed in a Draft Odour Management Plan (OMP) which will be prepared for consultation with the relevant stakeholders prior to Construction. An OMP will also be a requirement of any Environmental Permit for the Proposed Development (See Paragraph 9.112).

- 9.111 In summary as the air quality significance of effects is considered to be negligible. The Proposed Development is considered to comply with the relevant air quality policies and plans. All construction, operational and decommissioning and restoration air quality effects following mitigation are considered to be negligible and therefore it is anticipated that air quality will not be a material planning consideration with respect to the above proposals.
- 9.112 In addition to a planning consent the Proposed Development will also require an Environmental Permit to operate either as a new permit (s) or as a variation to the existing KGS Permit. The Environmental Permit will be regulated by the Environment Agency. The Environmental Permit application or variation process is a separate process to the planning process which focuses on the pollution control of the Proposed Development (e.g. air and odour emissions controls). This process will provide further detailed information concerning pollution control including a detailed odour management plan (OMP) and Best Available techniques to control emissions to air.

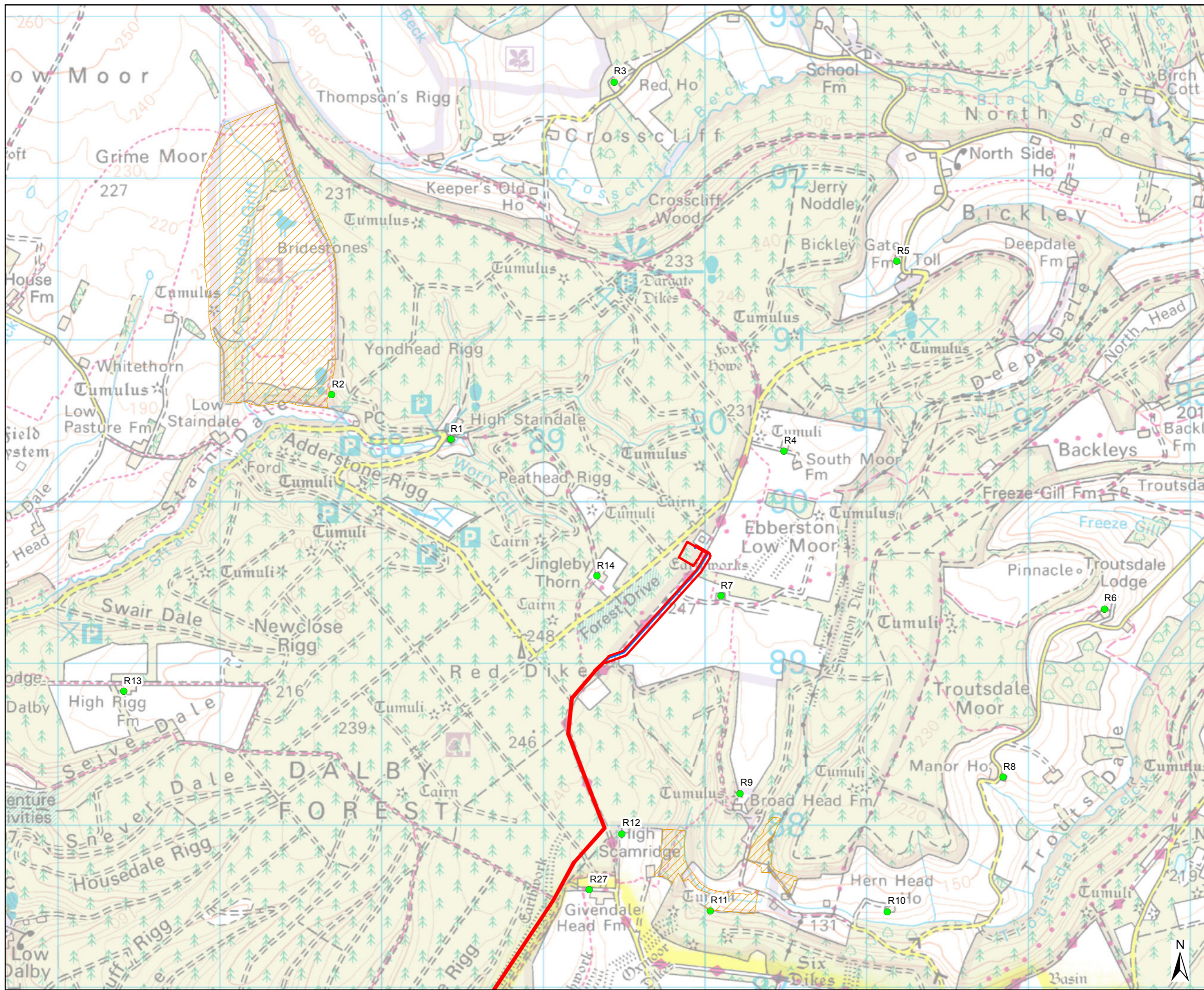
Table 9.10: Table of Significance – Air Quality

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	
<b>Construction</b>											
Increase in fugitive dust emissions during construction	Short term temporary	Negligible	Although, a negligible effect is predicted for dust effects these will be mitigated through the implementation of a dust action plan and CEMP.							*	Negligible
Construction traffic emissions	Short term temporary	Negligible	Changes in traffic are anticipated to be small and so no further mitigation is proposed.							*	Negligible
<b>Operation</b>											
Operational traffic emissions	Long term temporary	Negligible	Changes in traffic are anticipated to be small and so no further mitigation is proposed.							*	Negligible
Operational plant emissions (EDS Note)	Long term temporary	Negligible	The Proposed Development has been designed to minimise emissions to air. Good management processes will also be implemented to minimise emissions to air.							*	Negligible
<b>Decommissioning and Restoration</b>											
Increase in fugitive dust emissions during decommissioning and restoration	Short term temporary	Negligible	Although, a negligible effect is predicted for dust effects these will be mitigated through the preparation and implementation of a CEMP.							*	Negligible
Decommissioning and restoration traffic emissions	Short term temporary	Negligible	Changes in traffic are anticipated to be small and so no further mitigation is proposed.							*	Negligible
<b>Cumulative Effects</b>											
No effects											None

## \* Geographical Level of Importance

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

Eberston EDS Note: Operational Plant Emissions are Not Applicable if these have already been constructed and are operational as part of the Eberston Moor EDS



- NOTES
- Red Line Boundary
  - Pipeline
  - SSSI
  - Receptors

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Revision Details	
Rev #	29/07/13
Drawn By	EC
Checked By	DD
Approved By	DD
Date	29/07/13

Job Title  
**Eberston Moor 'A' Well Site to Knaptan Gas Pipeline**

Drawing Title  
**Air Quality Study Area - 1 of 2**

URS Internal Project Number	Zone/Mileage	Suitability
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Designed	Drawn	Stage 1 check
--	FB	DD
Stage 2 check	Approved	DD
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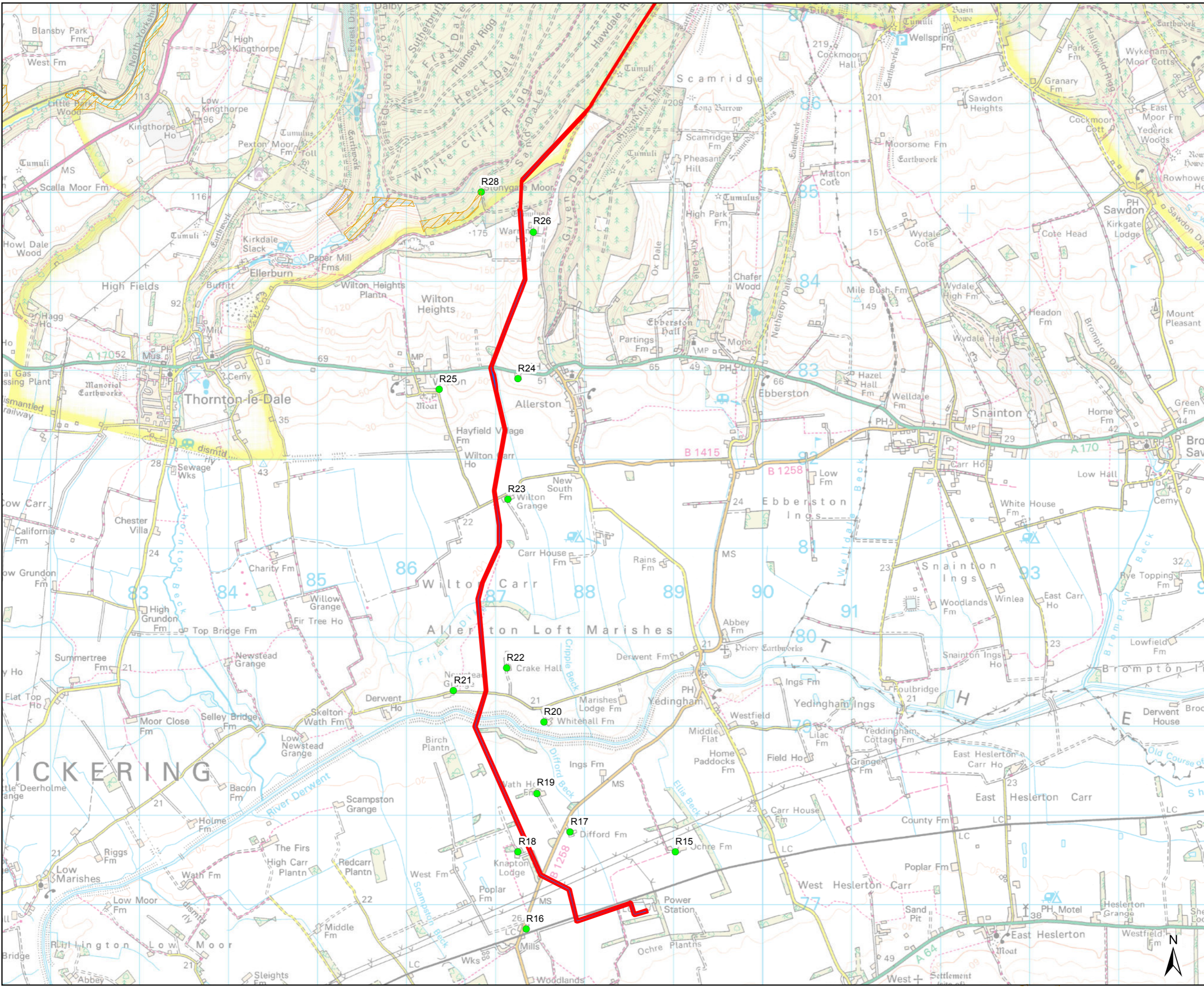
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 Date  
 29/07/13

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URS Infrastructure & Environment UK Limited  
 12 Regan Way,  
 Onevyn Business Park,  
 Onevyn Nottingham,  
 NG9 6RZ  
 Telephone +44(0)115 907 7000  
 www.ursglobal.com

**URS**

Drawing Number  
**Figure 9.1**



- NOTES**
- Red Line Boundary
  - Pipeline
  - SSSI
  - Receptors

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Revision Details	
Rev #	20/07/13
Drawn By	EC
Checked By	DD
Approved By	DD
Date	29/07/13

**Eberston Moor 'A' Well Site to Knaption Gas Pipeline**

**Air Quality Study Area - 2 of 2**

URS Internal Project Number	47063256	Zone/Mileage	-	Suitability	-
Designed	Drawn	Stage 1 check	Stage 2 check	Approved	DD
Scale at A3	1:39,261	Original	3341	Date	29/07/13

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URS Infrastructure & Environment UK Limited  
 12 Regan Way,  
 OneWorld Business Park,  
 OneWorld Nottingham,  
 NG9 6RZ  
 Telephone +44(0)115 907 7000  
 www.ursglobal.com



Drawing Number  
**Figure 9.2**