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6.0 NEED, ALTERNATIVES AND DESIGN EVOLUTION

6.1 Introduction

6.1.1 This chapter of the Environmental Statement (ES) sets out the need for the Proposed Development and the alternatives that have been considered for the Proposed Development as the design evolves. Such alternatives include:

- alternative sites to Eggborough Power Station;
- alternative locations for the Proposed Power Plant within the existing power station;
- alternative routes for the Proposed Gas Connection and Above Ground Installation (AGI);
- alternative technologies; and
- alternative design options and design evolution.

6.1.2 The consideration of alternatives and design evolution has been undertaken with the aims of preventing or reducing adverse environmental effects (following the mitigation hierarchy of avoid, reduce and, if possible, remedy) while maintaining operational efficiency and cost-effectiveness. The design has evolved through the Environmental Impact Assessment (EIA) process in response to consultation feedback and with reference to ongoing surveys and technical studies. Further evolution will likely occur beyond the submission of the DCO application (within the design parameters set by the draft DCO (Application Document Ref. No. 2.1, see the Requirements in Schedule 2 and parameters in Schedule 14). These parameters are considered further at Section 6.7 below.

6.1.3 The need for the Proposed Development is set out below but also discussed in Chapter 7: Legislative Context and Planning Policy Framework. Environmental mitigation measures that are embedded in the design of the Proposed Development are referenced in each technical chapter to which the mitigation relates.

6.1.4 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) (the 'EIA Regulations') state that the ES should include an outline of the main alternatives that have been studied and an indication of the main reasons for decisions made, taking into account the environmental effects. This should include consideration of 'do nothing'. Under these 2009 EIA Regulations (which are those applying to the Proposed Development) there is no requirement to assess alternatives, only a requirement to provide information regarding the alternatives that have actually been considered.

6.1.5 On the matter of alternatives, National Policy Statement (NPS) EN-1 (DECC, 2011a) para 4.4.1 and 4.4.2 state that *"This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option. However, applicants are obliged to include in their ES, as a matter of fact, information about the main alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility."*

6.1.6 This chapter is supported by Figures 6.1 and 6.2, provided in ES Volume II.

6.2 The Need for the Proposed Development

- 6.2.1 The Energy White Paper ‘Meeting the Energy Challenge’ published in 2007 by the Department for Trade and Industry, which formed the basis of the Energy Act 2008, sets out the Government’s plans for tackling climate change by reducing carbon emissions whilst ensuring the availability of secure, clean, affordable energy.
- 6.2.2 The White Paper and the Overarching NPS for Energy (EN-1) (DECC, 2011a) both emphasise the importance of a diverse mix of energy generating technologies, including renewables, nuclear and fossil fuels, to avoid over-dependence on a single fuel type and thereby ensure security of supply. The NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b) further emphasises that fossil fuel generating stations play a vital role in providing reliable electricity supplies as the UK makes the transition to a low carbon economy.
- 6.2.3 Guidance relating to the need for new energy infrastructure is provided in EN-1. Part 3 of the document outlines the need for the development of nationally significant energy infrastructure and highlights the vital role to economic prosperity and social well-being from ensuring the UK has secure and affordable energy. Furthermore, producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of infrastructure, both large and small scale.
- 6.2.4 Paragraph 3.1.2 states that it is for industry to propose new energy infrastructure and that the Government does not consider it appropriate for planning policy to set targets for or limits on different technologies. Notably, paragraph 3.1.3 stresses that the Secretary of State should assess applications for development consent for the types of infrastructure covered by the energy NPSs “...on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need...” is as described for each of them. Paragraph 3.1.4 continues that the Secretary of State should give substantial weight to the contribution that all projects would make toward satisfying this need when considering applications under the Planning Act 2008.
- 6.2.5 As such, the need that exists for new energy infrastructure is not open to debate or interpretation and is clearly confirmed by EN-1. Over the next 5-10 years a large number of existing oil, coal and nuclear power stations (including the existing Eggborough coal-fired Power Station) will close due in part to the requirements of Directive 2010/75/EU of the European Parliament and the Council on Industrial Emissions (the Industrial Emissions Directive (IED)) (European Parliament and the Council, 2010) and/or as plants reach the end of their operational lives. This will lead to a change in the current mix of energy. Projections in EN-1 indicate 22 GW of electricity generating capacity will close over this period. This creates a significant need for new major energy infrastructure which would help meet energy security needs by replacing closing electricity generating capacity, while at the same time contributing to the Government’s plan for a minimum need of 59 GW new electricity generating capacity by 2025.
- 6.2.6 The UK Government has undertaken Energy Market Reform (EMR), which is intended to deliver low carbon energy and reliable supplies that the UK needs, while minimising costs to consumers. The EMR introduces a key mechanism to provide incentives for the investment required in energy infrastructure – the Capacity Market, which provides a regular retainer payment to reliable forms of capacity (both demand and supply side), in return for such capacity being available when needed.

- 6.2.7 The reformed electricity market is intended to transform the UK electricity sector to one in which low-carbon generation can compete with conventional, fossil-fuel generation. It is recognised by Government that gas generation is still required to meet demand – particularly short term demand when renewable technologies are unavailable - and it also contributes to the objective of reducing national carbon dioxide (CO₂) emissions, as generating electricity from gas is more efficient and of lower carbon intensity than other fossil fuels such as coal, resulting in significantly lower CO₂ emissions per generated MW from gas-fired power stations compared to coal-fired power stations.
- 6.2.8 The long lead-in for new nuclear power stations also means that new fossil fuel and renewable generating capacity will need to be progressed to meet demand as existing generating assets close.
- 6.2.9 Renewable energy is important to achieve the UK’s targets for reductions in carbon emissions, but EN-1 also emphasises the ongoing requirement for fossil fuel power stations as they offer more flexibility in response to changes in energy demand compared to many renewable energy technologies. Recent DECC projections indicate that more than 15 GW of fast response generation plant is required in the UK to support the intermittency of renewable electricity generation. However, over-emphasis on small scale peaking plant – many of which are diesel-fired – is leaving the increasing concern that such plants will not be able to meet a predicted energy supply gap for the UK in short to medium term. Modifications to the Capacity Market are therefore under review in order to provide sufficient investment stimulus to enable deployment of projects such as the one proposed by the Applicant. The investment required to transform the UK’s electricity infrastructure will stimulate the economy, support the growth of UK supply chains and boost the jobs market.
- 6.2.10 The UK faces closure of existing generating capacity as older, more polluting, power stations close, whilst UK electricity demand is projected to grow as heat and transport systems are increasingly electrified. EN-1 stresses the need to replace closing electricity generating capacity as well as increasing capacity in response to a possible doubling of electricity consumption by 2050. In September 2015 EPL announced the expected closure of the existing coal-fired Eggborough Power Station in March 2016, but a subsequent supplemental balancing reserve (SBR) contract with National Grid enabled its continued operation in the short term up to March 2018.
- 6.2.11 For these reasons, the Applicant considers that there is a clear and compelling national need for the development of a new gas-fired electricity generating station and has selected the Site on which to do so for technical, environmental and commercial reasons (see further below). The Applicant therefore proposes to seek Development Consent for the construction and operation of a gas-fired power station at the Site.

6.3 Consideration of Alternatives

- 6.3.1 It is considered that the ‘Do Nothing’ scenario is not appropriate given the established national need for new energy generation (see Section 6.2 The Need for the Proposed Development above and Chapter 7: Legislative Context and Planning Policy Framework). Furthermore the closure of the existing Eggborough coal-fired Power Station in the near future underlines the importance of providing new generating capacity at the Site. The other key disadvantage of the ‘Do Nothing’ scenario would be the lack of additional investment in the local economy.

6.3.2 The Eggborough Power Station site has been selected by the Applicant for the development of a CCGT generating station, as opposed to other potentially available sites for the following reasons:

- the site has a long history of power generation;
- the existing coal-fired power station is facing closure and future redevelopment of the Power Station site would create similar employment opportunities (albeit a smaller number of operational staff will be required compared to the existing coal-fired power station);
- the site has excellent electrical grid, water and transport links and is a brownfield site which is considered more attractive to redevelop for large scale power generation than a greenfield one;
- the majority of the Site (and particularly the Proposed Power Plant Site) is largely in the freehold ownership of the Applicant; and
- the Proposed Power Plant Site is located relatively close to the National Grid gas transmission network (Feeder 29 is located approximately 3.1 km to the north of the existing coal-fired power station site).

6.3.3 The Applicant previously considered the conversion of the existing power station from coal to biomass fuel and received planning consent for such a conversion in 2013. However this was economically unviable and the project was not progressed. The existing electrical and water connections will therefore be available for use on closure of the coal-fired power station.

6.4 Consideration of Alternative Locations within the Existing Power Station Site and Plant Layout

6.4.1 There are a number of options available in relation to the specific location of plant within the existing power station site and in relation to the layout of the plant within the selected Proposed Power Plant Site. These were considered and evaluated at the feasibility stage and the preferred location for the Proposed Power Plant Site was selected as the coal stockyard of the existing power station.

6.4.2 During the preliminary options appraisal process in 2016, three potential Site Options for the Proposed Power Plant were identified and considered. These were:

- Golf Course Site Option, located between the existing power station infrastructure and the A19, on the site of the existing golf course;
- Coal Stockyard Site Option, located within the existing coal stockyard; and
- Lagoon Site Option, located to the north-east of the coal stockyard, on land currently comprising a man-made lagoon, strategic coal stockyard (not in use) and contractor site offices. Two potential layouts were considered for this Site Option reflecting two different potential orientations of plant.

6.4.3 Indicative locations for each of these Site Options are illustrated in Figure 6.1 (ES Volume II).

6.4.4 Based on an appraisal of technical, environmental and planning considerations, during the scoping stage, the Golf Course Site Option was ruled out on the basis of:

- loss of the golf course, sports and social club, wider sports amenity and established woodland;

- space constraints (the available area is too small to accommodate the Proposed Development);
- proximity to and interaction with existing overhead power lines;
- the potential for fogging and icing on the A19 from operation of the proposed cooling towers; and
- the proximity to designated heritage assets (including a Scheduled Monument approximately 540 m to the west and Grade II listed milestone on the western boundary of the area).

6.4.5 The Coal Stockyard and Lagoon Site Options were therefore shortlisted for more detailed analysis following EIA Scoping and both options were retained for Stage 1 consultation in September 2016.

6.4.6 Further analysis of technical, environmental, planning and legal considerations of these shortlisted Site Options was subsequently undertaken to provide high-level comparison. The main reasons for the selection of the Coal Stockyard Site Option were:

- the Coal Stockyard Site Option could be connected to the existing 400 kV sub station by shorter, underground cables, whereas the Lagoon Site Option would have a longer, overhead connection, with associated increased cost and visual impact;
- the Lagoon Site Option would require infilling of and construction upon the existing lagoon, which would introduce unknown ground risks to the design of suitable foundations at this site, compared to the Coal Stockyard Site Option, which is known to be suitable for piled foundations;
- the Coal Stockyard Site Option would be easier to construct as it has fewer constraints surrounding the site compared to the Lagoon Site Option, which is adjacent to the existing Air Liquide air separation unit and the Yorkshire Water waste water treatment works sites;
- there would be greater physical separation between the demolition of the existing power station and construction of the Proposed Development at the Coal Stockyard Site Option compared to the Lagoon Site Option;
- the Proposed Power Plant would be located further from the nearest sensitive residential receptors (at Gallows Hill) at the Coal Stockyard Site, compared to the Lagoon Site Option;
- localised visual screening (in the form of an earth bund planted with trees) is already present around the Coal Stockyard Site Option whereas the Lagoon Site Option is less well screened; and
- the only benefits of the Lagoon Site Option compared to the Coal Stockyard Site Option would be the slightly shorter length of cooling water and gas underground pipeline connections.

6.4.7 The Coal Stockyard Site Option was therefore selected as the preferred location for the Proposed Power Plant Site. Iterative refinement of the indicative concept layout within this Site Option has since been undertaken and the current indicative concept layout options are shown on Figures 4.1a and 4.1b (ES Volume II). These refinements have included:

- refinement of building orientation and sizing to accommodate the slightly different dimensions provided by the four main technology providers, such that the worst case building dimensions are presented and assessed in the ES, and addition of other auxiliary plant and structures;

- the size of the surface water attenuation basin has been increased to accommodate runoff during a 1 in 30 year storm event assuming as a worst case that no infiltration is possible, and an infiltration/ attenuation pond has been added in the south-east corner of the Proposed Construction Laydown area;
- determination of appropriate limits of deviation for the finished ground level for the Proposed Power Plant Site, balancing minimising flood risk and material requirements, such that significant volumes of materials are not required to be imported or exported from the Site;
- moving the main structures further west on the coal stockyard to avoid the need to remove existing trees or landscaping bunds and also to move the Proposed Power Plant further from both the residential community of Gallows Hill and the former underground mine workings of Kellingley Colliery;
- inclusion of a rail 'run around' (modification to part of the existing rail loop) to enable rail access to the Site for the purposes of construction, and minor relocation of water tanks and water treatment plant to allow space for this facility;
- locations of underground pipelines have been amended as the layout has been refined; refinement of the layout to allow easier routing of exhaust ducts to the possible future carbon capture plant within the Proposed CCR Land; and
- fixing of the co-located CCGT stack locations and heights to enable robust assessment of associated environmental effects (in particular air quality, landscape and visual amenity effects).

6.4.8 A full description of refinements to the Proposed Development since the publication of the PEI Report in January 2017 is set out in Section 6.7 below.

6.5 Consideration of Alternative Gas Connection Routes

6.5.1 Initially, connection to two potential National Grid Gas pipelines (called Feeder 7 and Feeder 29) was considered for the Proposed Development, in order to consider the advantages or disadvantages of either connection. However, through discussions with National Grid, and evaluation of the capacity of the Feeders and the distance from the Proposed Development Site to them, it was determined that Feeder 29 was the most appropriate connection point, as it was the shortest distance from the Site and also had greater gas supply capacity than Feeder 7.

6.5.2 Three potential route corridors for the gas pipeline to connect to Feeder 29 were identified and considered at the Scoping and Stage 1 consultation stages. These were:

- A: to the north-west, approximately 4.5 km in length, joining Feeder 29 to the south of Gateforth (adjacent to the proposed connection point for the proposed Knottingley CCGT power station);
- B: to the north, approximately 3 - 4 km in length, joining Feeder 29 at one of three possible connection points:
 - i. west of the railway line, off West Lane;
 - ii. east of the railway line and south of Burn Lane Farm; or
 - iii. east of the railway line and south of Stocking Green Farm.
- C: to the east, approximately 5 km in length, joining Feeder 29 to the north-west of Carlton (adjacent to the proposed connection point for the proposed Thorpe Marsh CCGT power station).

- 6.5.3 These three indicative route corridors are shown on Figure 6.2 (ES Volume II).
- 6.5.4 A ‘heat mapping’ exercise was conducted to evaluate each of these routes, taking account of a range of technical, environmental, and health and safety considerations.
- 6.5.5 During the EIA Scoping stage, the eastern route (C) was ruled out because it:
- was the longest route, and would therefore be likely to take longer, would require more land and would be more costly to construct;
 - would require not only a crossing of the River Aire (as all three route corridors do) but also a crossing of at least one railway line;
 - would affect a wider area; and
 - runs closer to existing residential areas.
- 6.5.6 Further analysis of technical, environmental and planning considerations of the remaining options was undertaken, and the conclusions are summarised below.
- 6.5.7 The north-western route connecting to Feeder 29 with an AGI south of Tom’s Wood (A), the northern route with an AGI south of Burn Lane Farm (Bii), and the northern route with an AGI south of Stocking Green Farm (Biii) were ruled out in favour of the northern route with an AGI in the vicinity of West Lane for the following key reasons:
- the north-western route connecting to Feeder 29 south of Tom’s Wood (A) would –
 - be co-located with the proposed AGI for the proposed Knottingley CCGT development, which would introduce complexity during construction with no obvious operational benefit to the Applicant or National Grid,
 - have a greater anticipated risk of encountering shallow groundwater during construction with potential implications on dewatering requirements and buoyancy of pipework compared to the alternative northern route,
 - require a crossing of a major water main,
 - have greater potential for impacts on trees and hedgerows compared to the other route options (or more constraints to route around),
 - have the AGI located close to woodland with potential for disturbance of ecological receptors;
 - the northern route connecting to Feeder 29 either south of Burn Lane Farm (Bii) or Stocking Green Farm (Biii) would –
 - require a crossing beneath the East Coast Main Line, which would not be required for the alternative routes,
 - have the AGI located closer to sensitive residential receptors compared to the alternative AGI locations, and
 - have the AGI located within Flood Zone 3, whereas the alternative AGI locations would allow the development to be in Flood Zone 2.
- 6.5.8 The northern route with an AGI in the vicinity of West Lane (Bi) is the shortest route with the least significant constraints and this was therefore selected as the preferred route.
- 6.5.9 The initial 500 m route evaluation corridor was refined to a width of circa 100 m (wider at crossing points and including temporary land requirements for construction access) prior to the publication of the Preliminary Environmental Information (PEI) Report for consultation in January 2017. This corridor has since undergone further evaluation and refinement using

additional survey information and consultation responses, and the working width has now been reduced to 36 m (wider at crossing points and with additional land required for access) for the DCO application.

- 6.5.10 The PEI Report considered two options for the route between the River Aire and Hensall Gate. The first option was to continue south-west to Wand Lane then turn east/ south-east within or alongside Wand Lane, before turning south/ south-west into the existing coal-fired power station site in the vicinity of the existing Hensall Gate entrance and along the internal access road to the Proposed Power Plant Site. The second option was for the pipeline to turn south before reaching Wand Lane, and cross Wand Lane into the existing coal-fired power station site in the vicinity of the existing Hensall Gate entrance to reach the Proposed Power Plant Site. The second option was selected and included as part of the Proposed Development in the DCO application, for principally technical reasons - it would reduce the number of sharp bends in the pipeline (with less impact on gas pressure), minimise work within Wand Lane (and associated disruption to users of Wand Lane) and minimise loss of trees north of Wand Lane.

6.6 Consideration of Alternative Technologies

- 6.6.1 Although natural gas will be the fuel for the Proposed Development for the reasons outlined in Section 6.2, there are still a number of alternative technologies available for the Proposed Development. This includes use of different plant configurations for the CCGT units – denoted single shaft and multi-shaft – as outlined in Chapter 4, and the use of either OCGT units or reciprocating gas engines for the peaking plant and black start facility. The draft DCO allows flexibility regarding the CCGT plant configuration and the type of technology to be installed for the peaking and black start plants.
- 6.6.2 Such flexibility is required to enable EPL to respond to changes in generation and demand due to the influence of the increase in renewable generation on the UK electrical market requirements.
- 6.6.3 The latest generation of high efficiency CCGT units are in the relatively early stages of development, and will continue to improve their capabilities before the eventual commissioning date of the Proposed Development. Multi shaft and single shaft configuration CCGT plants also have differing performance characteristics so it is not clear, at this stage, which will be best suited to meet these evolving market requirements. Moreover, it is expected that National Grid's requirements will continue to evolve such that the ability to maintain both multi shaft and single shaft options as long as possible prior to construction commencing would be advisable. In doing so, EPL intend to select the most efficient and flexible plant possible to help meet UK energy needs as well as helping to improve energy security.
- 6.6.4 Optionality is also maintained within the draft DCO for the technology used for the peaking and black start plants (open cycle gas turbines (OCGT) or reciprocating engines with combined gross output capacity of up to 299 MW). The best available technology for black start and peaking plant is dependent upon the power output and plant rate of response required – larger capacity is more suited to OCGT, and smaller capacity is better suited to reciprocating gas engines. The decision on the most efficient and suitable technology cannot be made until the power output requirements are determined.

6.6.5 Where the configuration and/or type of technology has the potential to lead to materially different environmental effects of the Proposed Development, the options are considered in this ES and a worst case is presented – this is relevant to air quality and noise emissions, and landscape and visual effects, and further information on how the options are considered is set out in Chapters 8: Air Quality, 9: Noise and Vibration and 14: Landscape and Visual Amenity.

6.7 Consideration of Alternative Design Options and Design Evolution

6.7.1 Throughout the ongoing design process, consideration is being given to a range of design options. These decisions have, where relevant and possible, been informed by environmental appraisal and assessment work and by consultation with stakeholders, and the design has evolved (and continues to be refined) through a continuous process of environmental assessment, consultation and development.

6.7.2 Aspects of design that have been determined and fixed in the draft DCO include:

- the CCGT stacks will be co-located and their locations and height are fixed in the draft DCO (Application Document Ref. No. 2.1 Schedule 14) (see Chapter 4: The Proposed Development);
- up to three CCGT units will be installed (Application Document Ref. No. 2.1 Schedule 1);
- a gas-fired peaking plant will be installed (housed in a building) and black start capability will be included, using gas as the primary fuel (Application Document Ref. No. 2.1 Schedule 1);
- the gross output capacity of the Proposed Development will be up to 2,500 MW, with the gross output capacity of the peaking plant limited to a maximum of 299 MW (Application Document Ref. No. 2.1 Schedule 1).

6.7.3 Other aspects have not yet been determined so the draft DCO incorporates flexibility on these matters and the EIA has assessed options and/or ‘worst case’ scenarios where relevant:

- whether a single shaft or multi-shaft configuration will be used (as discussed in Section 6.6 above);
- the manufacturer of the CCGT units and therefore the final dimensions of the proposed structures and buildings (the DCO defines limits of deviation for the layout and maximum parameters for building/ structure dimensions); and
- the choice of peaking plant and black start plant technology (OCGT or reciprocating gas engines) (as discussed in Section 6.6 above).

6.7.4 The Rochdale Envelope approach has been applied to address these options, as set out in each technical chapter of this ES.

6.7.5 The design and definition of the Proposed Development has continued to evolve since the publication of the PEI Report, partly in response to consultation responses, and also due to ongoing refinement of the design and Site boundary with reference to additional survey information and ongoing discussions with the four main CCGT technology providers. These changes are summarised in Table 6.1 below.

Table 6.1: Summary of key changes to the Proposed Development since publication of the PEI Report

Topic	Status reported in the PEI Report	Status now reported in ES and draft DCO	Reason for change
Application Site area and boundary	Site area c. 157 ha and Site boundary as shown on Figure 3.1 in PEI Report Volume II.	<p>Site area reduced to c.102.5 ha and Site boundary as shown on Figure 3.1 in ES Volume II.</p> <p>In general, areas have been removed from the indicative application site boundary in the PEI Report - in particular the Proposed Gas Connection corridor has been refined from c. 100 m to c. 36 m, and parts of the existing coal-fired power station not required for the Proposed Development have been removed from the Site boundary. However in a small number of cases it has been necessary to include areas of land that were not previously included. These are:</p> <ul style="list-style-type: none"> • <i>Construction working areas at the AGI.</i> A small extension was made to the western boundary of the AGI area for temporary construction compounds, to avoid impacts on trees and field boundaries to the south. • <i>Burn Lodge Farm temporary construction access.</i> The construction access to the north of Burn Lodge Farm was ruled out, and the arrangement of the preferred option to the south of Burn Lodge Farm has been refined following consultation with the landowner and tenant farmer, and to provide a suitable offset distance from ditches along the field boundaries. • <i>Fox Lane temporary construction access.</i> The construction access in this location has been refined and moved further south following consultation with the landowners and tenants. • <i>Pipeline connections to cooling water abstraction and discharge points.</i> The routes of the existing cooling water pipelines have been reviewed and the Site boundary amended to ensure that their full extent is 	Refined to be more specific using information from additional surveys (including arboricultural and geophysical surveys of the Proposed Gas Connection corridor), feedback from consultation, and ongoing evaluation and refinement of the Proposed Development design.

Topic	Status reported in the PEI Report	Status now reported in ES and draft DCO	Reason for change
		<p>included (each of the intake and discharge pipelines appear to be, in small sections, slightly outside EPL ownership).</p> <ul style="list-style-type: none"> • <i>Trees north of Wand Lane to the east of Hensall Gate.</i> These trees are in EPL ownership and are included in the Site boundary so that they can be protected and maintained for landscape screening purposes by DCO Requirement, in response to consultation with NYCC. • <i>Land in the vicinity of Hensall Dyke.</i> An additional area of land (mainly within EPL ownership) has been included within the south-east corner of the Proposed Power Plant Site to enable a connection for surface water drainage. 	
Indicative layouts for Proposed Development	Indicative layouts were provided in PEI Report Volume II Figures 4.1a and 4.1b	The indicative layouts have been updated following ongoing discussions with the four main CCGT technology providers. Revised layouts are presented in ES Volume II Figures 4.1a and 4.1b. The changes include the arrangement of the black start and peaking plant buildings (the peaking plant building is 10 m longer and the black start building is 10 m shorter and rotated), the increased size of the surface water attenuation basin, and the inclusion of auxiliary boiler stacks, a small diesel tank located outside the black start building, the rail runaround, and an infiltration/ attenuation pond in the south-east corner of the Proposed Construction Laydown area	Input from ongoing discussions with the four main technology providers.
Minimum finished ground level at the Proposed Power Plant Site	7.7 mAOD presented as the lower limit of deviation, based on the recommendation of the Flood Risk Assessment (Appendix 11A in ES Volume III) that the main plant and flood sensitive equipment should be placed above the River Aire 1 in 100	Following further review of the design and construction methods, the lower limit of deviation has been increased to 7.9 mAOD (approximately 1 m below the current coal stockyard base).	Refinement of the Proposed Development design.

Topic	Status reported in the PEI Report	Status now reported in ES and draft DCO	Reason for change
	year flood level plus an allowance for climate change (7.65 mAOD).		
CCGT stack height	80 m or 90 m high stacks considered as options, with proposed limits of deviation for the finished ground level at the Proposed Power Plant Site identified as 7.7 mAOD to 9.9 mAOD.	Stack height fixed at 99.9 mAOD, based on a 90 m stack located on the maximum finished ground level of 9.9 mAOD.	Although no significant air quality effects are predicted for either an 80 m or 90 m high stack, responses provided on feedback forms confirmed 51% of respondents would prefer a higher (90 m) stack with slightly lower concentrations of air pollutants at receptors to a shorter (80 m) stack with a slightly lower visual impact (but still no significant air quality effects), compared to 18% preferring the shorter stack and 31% don't know/blank.
Peaking plant and black start facility emissions parameters	Air quality assessment presented in Chapter 8: Air Quality (PEI Report Volume I) assumed approximate flue diameter for an OCGT peaking plant of	Air quality assessment presented in Chapter 8: Air Quality (ES Volume I) assumes approximate flue diameter for an OCGT peaking plant of 8.0 m (1.5 m less than at PEI Report stage) and assumptions on black start facility emissions and stack also	Refinement of Proposed Development design.

Topic	Status reported in the PEI Report	Status now reported in ES and draft DCO	Reason for change
	9.5 m and details of black start facility emissions and stack 'to be confirmed'	included in assessment (see Table 8.9 in Chapter 8: Air Quality).	
Cooling technology	Hybrid or wet cooling considered as options.	Hybrid cooling presented as preferred option, but the final decision is pending agreement with the Environment Agency through the Environmental Permit application process.	Responses provided on feedback forms confirmed 44% of respondents would prefer hybrid cooling to wet cooling, 13% would prefer wet cooling to hybrid cooling and 44% don't know/ blank.
Temporary cofferdam at the cooling water abstraction and discharge points	Discussed as a possible worst case for works in the River Aire but not considered in detail due to the need to refine the works required, their extent and timing.	Requirement for a coffer dam confirmed, additional details of extent and duration determined, and impacts assessed accordingly within the ES.	Evolution of Proposed Development design in response to consultation responses.
Routes of Proposed Cooling Water and Gas Connections between River Aire and Wand Lane	Two options for the routes immediately north of Wand Lane under consideration: 1. continue south-west to Wand Lane then turn east/ south-east within or alongside Wand Lane, before turning south/ south-west into the existing coal-fired power station site in the vicinity of the existing Hensall Gate entrance and along the internal access road to the Proposed Power Plant Site; or 2. turn south before reaching Wand	Option turning south within the agricultural field north of Wand Lane and crossing Wand Lane immediately east of Hensall Gate selected for the Proposed Cooling Water and Gas Connections.	Technical reasons: <ul style="list-style-type: none"> • reduces the total number of bends in the gas pipeline route (with reduced gas pressure drop); • minimises work within/ disruption to Wand Lane; • minimises potential loss of trees north of

Topic	Status reported in the PEI Report	Status now reported in ES and draft DCO	Reason for change
	<p>Lane, and cross Wand Lane into the existing coal-fired power station site in the vicinity of the existing Hensall Gate entrance to reach the Proposed Power Plant Site.</p> <p>The latter option was stated to be the preferred option for the Proposed Gas Connection route for technical reasons.</p>		<p>Wand Lane; and</p> <ul style="list-style-type: none"> • both cooling and gas pipelines located within the same corridor to minimise the development footprint and associated easement.
<p>Surface water discharge from Site</p>	<p>Outline Drainage Strategy presented in Appendix 11A (Flood Risk Assessment) in PEI Report Volume III, setting out options for the discharge of surface water runoff to one of the watercourses surrounding the Site (Hensall Dyke to the south-east, or Ings and Tetherings Drain or River Aire to the north)</p>	<p>Surface water drainage from the Proposed Power Plant Site and Proposed Construction Laydown Area to be discharged to Hensall Dyke, and Site boundary amended to include connection location.</p>	<p>Refinement of the Outline Drainage Strategy and consultation with the relevant Internal Drainage Board.</p>
<p>AGI site layout</p>	<p>Indicative area identified for AGI compounds based on initial layout.</p>	<p>Indicative layout of National Grid and EPL compounds and associated construction laydown and access refined (see Figure 4.4) and Site boundary updated accordingly.</p>	<p>Evolution of Proposed Development design.</p>
<p>Environmental surveys</p>	<p>Air quality survey (diffusion tube monitoring), aquatic invertebrate survey, geophysical (archaeology) survey, traffic surveys on West Lane and Fox Lane, Agricultural Land Classification soil survey, and arboricultural survey findings were not available at the time of PEI Report publication in January 2017.</p>	<p>Air quality survey (diffusion tube monitoring), aquatic invertebrate survey, geophysical (archaeology) survey, traffic surveys on West Lane and Fox Lane, Agricultural Land Classification soil survey, and arboricultural survey findings used to refine the concept design and inform the EIA. These are reported respectively in Chapters 8: Air Quality, Chapter 10: Ecology and Nature Conservation, Chapter 14: Traffic and Transport, Chapter 15: Land Use, Agriculture and Socio-Economics and in the Indicative Landscape and Biodiversity</p>	<p>Additional surveys completed, some of which were in response to discussions with statutory consultees and the local community.</p>

Topic	Status reported in the PEI Report	Status now reported in ES and draft DCO	Reason for change
Cumulative impact assessment	List of other proposed developments considered relevant to the assessment included: Eggborough Coal-Fired Power Station Decommissioning and Demolition, Knottingley Power Station and Pipeline, Southmoor Energy Centre, Thorpe Marsh CCGT Power Station, Thorpe Marsh Gas Pipeline, Ferrybridge Multifuel 2, residential development of 55 dwellings, residential development of 64 dwellings, single storey production facility, Advanced Thermal Treatment Plant, hydroelectricity generating scheme, solar farm, Kellingley Colliery Business Park, Yorkshire and Humber Carbon Capture and Storage (CCS) Pipeline.	Strategy (Application Document Ref. No. 5.10). List of other proposed developments considered relevant to the assessment expanded and updated as follows (see Chapter 20: Cumulative and Combined Effects): <ul style="list-style-type: none"> • Euro Auctions extension added to assessment (new planning application submitted January 2017); and • Yorkshire and Humber CCS Pipeline removed from assessment (DCO application refused January 2017). 	Comments received during consultation and changes to status of other proposed developments.

6.8 References

Department for Energy and Climate Change (2011a) *Overarching National Policy Statement (NPS) for Energy: EN-1*. The Stationery Office, London.

Department for Energy and Climate Change (2011b) *National Policy Statement for Fossil Fuel Generating Infrastructure: EN-2*. The Stationary Office, London.